# Routing Switch

# Command Line Reference

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| **Issue** | **V**3.3.1 |
| **Date** | 2026-01-28 |

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# Revision History

| Date | Version | Description |
|---|---|---|
| 2024-06-26 | R1.0 | First Release |
| 2024-10-14 | V3.0.15 | Product version update. For product version V3.0.15 |
| 2024-11-20 | V3.0.15.6 | Correction，add commands based on functionality |
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| 2025-07-04 | V3.0.20 | Correction，add commands based on functionality |
| 2025-10-22 | V3.0.21 | Correction，add commands based on functionality |
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# 1 Preface

## 1.1 Declaration

This document updates at irregular intervals because of product upgrade or other reason.

This document is for your reference only.

## 1.2 Audience

This document is for the following audiences:

- System maintenance engineers
- Debugging and testing engineers
- Network monitoring engineers
- Field maintenance engineers

## 1.3 Conventions

**Table 1-1** Command syntax convention table

| Syntax | Description |
|---|---|
| Italic type with capital letters | Use *italic type* with capital letters for the parameters of the commands.<br>Parameters are the parts which need to replace with the actual value. |
| (x\|y\|...) | Select one among the choices. |
| (x\|y\|...\|) | Select one or none among the choices. |
| [x\|y\|...] | Select one or more among the choices. The choices can be selected repeatedly. |
| [x\|y\|...\|] | Select one or more or none among the choices. The choices can be selected repeatedly. |

| | |
|---|---|
| {x\|y\|...} | Select one or more among the choices. The choices can be selected only once. |
| {x\|y\|...\|} | Select one or more or none among the choices. The choices can be selected only once. |
| <x-y> | Select a number between x and y. |

# 2 Basic Commands

## 2.1 System Configuration Commands

### 2.1.1 hostname

#### Command Purpose

To specify or modify the host name for the network server, use the "hostname" command in Global Configuration.

To restore the configuration to the default, use the "no hostname" command.

#### Command Syntax

hostname *NAME*

no hostname

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | New host name for the network server | Host name is a string with 1-63 characters |

#### Command Mode

Global Configuration

#### Default

The default host name is Switch.

#### Usage

The host name is used in prompts and default configuration filenames.

The name must also follow the rules for ARPANET host names. They have as interior characters only letters, digits, hyphens, and underline. Names must be 64 characters or fewer.

### Examples

The following example changes the host name to “sandbox”:

```
Switch# configure terminal
Switch(config)# hostname sandbox
sandbox(config)#
```

The following example unsets the configured hostname:

```
sandbox# configure terminal
sandbox(config)# no hostname
Switch(config)#
```

### Related Commands

None

## 2.1.2 management ip address

### Command Purpose

Use this command to set the management IP address on the Switch.

To remove the management IP address, use the no form of this command.

### Command Syntax

management ip address ( *A.B.C.D/M* | *A.B.C.D* mask ) ( gateway *A.B.C.D* | )

no management ip address

management ipv6 address ( *X:X::X:X/M* | *X:X::X:X* mask ) ( gateway *X:X::X:X* | )

no management ipv6address

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| A.B.C.D/M | The management IPv4 address with mask length configured | IPv4 address with mask length 1-32 |

| | | |
|---|---|---|
| A.B.C.D mask | The management IPv4 address and mask configured | IPv4 address and mask |
| X:X::X:X/M | The management IPv6 address with mask length configured | IPv4 address with mask length 1-128 |
| X:X::X:X mask | The management IPv6 address and mask configured | IPv6 address and mask |
| gateway A.B.C.D | Add IPv4 gateway | IPv4 address |
| gateway X:X::X:X | Add IPv6 gateway | IPv6 address |

## Command Mode

Global Configuration

## Default

None

## Usage

None

## Examples

The following example sets the management ipv4 address:

```
Switch# configure terminal
Switch(config)# management ip address 192.168.100.100/24
```

The following example unsets the management ipv4 address:

```
Switch# configure terminal
Switch(config)# no management ip address
```

The following example sets the management ipv6 address:

```
Switch# configure terminal
Switch(config)# management ipv6 address 2001:1000::1000/96
```

The following example unsets the management ipv6 address:

```
Switch# configure terminal
Switch(config)# no management ipv6 address
```

### Related Commands

None

## 2.1.3 management route

### Command Purpose

Use this command to set the gateway on the Switch for management ip.

### Command Syntax

management route ( add | del ) gateway *A.B.C.D*

management ipv6 route ( add | del ) gateway *X:X::X:X*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| add | Add the route | - |
| del | Del the route | - |
| ipv6 | Configure IPv6 gateway | - |
| gateway | Add gateway | - |
| A.B.C.D | The IPv4 address of the gateway | IPv4 address |
| X:X::X:X | The IPv6 address of the gateway | IPv6 address |

### Command Mode

Global Configuration

### Default

None

### Usage

None

### Examples

The following example sets the gateway of 192.168.100.254 for the switch:

```
Switch# configure terminal
Switch(config)# management route add gateway 192.168.100.254
```

The following example sets the gateway of 200110001 for the switch:

```
Switch# configure terminal
Switch(config)# management ipv6 route add gateway 2001:1000::1
```

### Related Commands

None

## 2.1.4 show management arp

### Command Purpose

Use This command to show the ARP of the management port.

### Command Syntax

show management arp

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following example shows the ARP of the management port:

```
Switch# show management arp
Address          Hardware Addr        Interface
---------------+--------------------+----------
10.10.39.241     24:6e:96:62:3f:c4    mgmt-if
10.10.39.254     00:1e:08:09:67:6d    mgmt-if
```

### Related Commands

None

## 2.1.5 show management ip address

### Command Purpose

Use This command to show the IP address of the management port.

### Command Syntax

show management ip address

show management ipv6 address

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following example shows the IP address of the management port:

```
Switch# show management ip address
  Management IP address is:  192.168.100.100/24
  Gateway: 192.168.100.254



Switch# show management ipv6 address
  Management IPv6 address is:  2001:1000::1000/96
  Gateway: 2001:1000::1
```

### Related Commands

None

## 2.1.6 show management interface

### Command Purpose

Use this command to display the configurations and statistics on management interface.

### Command Syntax

show management interface

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following example shows how to display the configurations and statistics on management interface:

```
Switch# show management interface
Management Interface current state: DOWN
Description:
Link encap: Ethernet       HWaddr: 94:EB:AB:88:2A:B4
Inet addr: 192.168.100.102 Mask: 255.255.255.0
Bcast: 192.168.100.255     MTU: 1500
Speed: 10                  Duplex: Half
Auto-negotiation: Enable
Received:              2 Packets,             128 Bytes (128.0 b)
Transmitted:           1 Packets,              78 Bytes (78.0 b)
```

### Related Commands

clear counters mgmt-if

## 2.1.7 clear counters mgmt-if

### Command Purpose

Use this command to clear statistics counters on management interface.

### Command Syntax

clear counters mgmt-if

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following example shows how to clear statistics counters on management interface:

```
Switch# clear counters mgmt-if
```

### Related Commands

None

## 2.1.8 enable password

### Command Purpose

Use this command to set the password which is needed when user enter Privileged EXEC mode.

### Command Syntax

enable password ( privilege *LEVEL* | ) ( 8 | ) *LINE*

no enable password

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| Privilege LEVEL | User privilege level | Level value <1-4> |
| 8 | Specifies a hidden password will follow | - |
| LINE | The password string | - |

### Command Mode

Global Configuration

### Default

None

### Usage

If this command is set, user need to provide the password when enter Privileged EXEC mode.

### Examples

The following example shows how to set the password:

```
Switch# configure terminal
Switch(config)# enable password 123
Switch(config)# exit
Switch# disable
Switch> enable
Password:
Switch#
```

### Related Commands

None

## 2.1.9 terminal length

### Command Purpose

To set the number of lines on the current terminal screen for the current session, use the terminal length command in EXEC mode. To restore the configuration to the default, use the no form of this command.

### Command Syntax

terminal length *LENGTH*

terminal no length

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LENGTH | Number of lines on the screen | The value is a number from 0 to 512. A value of zero disables pausing between screens of output |

### Command Mode

Privileged EXEC

### Default

Automatically detected by terminal screen length by default

### Usage

The system uses the length value to determine when to pause during multiple-screen output. A value of zero prevents the switch from pausing between screens of output.

Some types of terminal sessions do not require you to specify the screen length because the screen length specified can be learned by some remote hosts. For

example, the rlogin protocol uses the screen length to set up terminal parameters on a remote UNIX host.

### Examples

In the following example, the system is configured to prevent output from pausing if it exceeds the length of the screen:

```
Switch# terminal length 0
```

### Related Commands

service terminal-length

## 2.1.10 service terminal-length

### Command Purpose

To set the number of lines on the current terminal screen for all sessions, use the service terminal-length command in Global Configuration. To restore the configuration to the default, use the no form of this command.

### Command Syntax

service terminal-length *LENGTH*

no service terminal-length

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LENGTH | Number of lines on the screen | The value is a number from 0 to 512. A value of zero disables pausing between screens of output |

### Command Mode

Global Configuration

### Default

None

### Usage

The system uses the length value to determine when to pause during multiple-screen output. A value of zero prevents the switch from pausing between screens of output.

Some types of terminal sessions do not require you to specify the screen length because the screen length specified can be learned by some remote hosts. For example, the rlogin protocol uses the screen length to set up terminal parameters on a remote UNIX host.

### Examples

In the following example, the system is configured to prevent output from pausing if it exceeds the length of the screen:

```
Switch# configure terminal
Switch(config)# service terminal-length 0
```

### Related Commands

terminal length

## 2.1.11 banner motd

### Command Purpose

To set a single or multiline message banner that appears on the screen when someone logs in to the switch, use the banner motd command in Global Configuration. To restore the configuration to the default, use the no form of this command.

### Command Syntax

banner motd line

no banner motd

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LINE | message string | specify a visible character as delimiting character, enter the message between 2 delimiting characters. At most support 99 lines with 1023 character in each line |

## Command Mode

Global Configuration

## Default

None

## Usage

None

## Examples

The following example shows how to set a single message banner:

```
Switch# configure terminal
Switch(config)# banner motd #
Enter TEXT message.  End with the character '#'.
this is a example message#
```

## Related Commands

banner exec

banner login

# 2.1.12 banner exec

## Command Purpose

To set an exec banner to be displayed on all connected terminals and this banner appears when terminal in Privileged EXEC mode, use the banner motd command in

Global Configuration. To restore the configuration to the default, use the no form of this command.

## Command Syntax

banner exec line

no banner exec

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LINE | message string | specify a visible character as delimiting character, enter the message between 2 delimiting characters. At most support 99 lines with 1023 character in each line |

## Command Mode

Global Configuration

## Default

None

## Usage

None

## Examples

The following example shows how to set a single message banner:

```
Switch# configure terminal
Switch(config)# banner exec #
Enter TEXT message.  End with the character '#'.
this is a example message#
```

## Related Commands

banner motd

banner login

## 2.1.13 banner login

### Command Purpose

To set a login banner to be displayed on all connected terminals, and this banner appears after the MOTD banner and before the login prompt, use the banner motd command in Global Configuration. To restore the configuration to the default, use the no form of this command.

### Command Syntax

banner login line

no banner login

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LINE | message string | specify a visible character as delimiting character, enter the message between 2 delimiting characters. At most support 99 lines with 1023 character in each line |

### Command Mode

Global Configuration

### Default

None

### Usage

None

### Examples

The following example shows how to set a single message banner:

```
Switch# configure terminal
Switch(config)# banner login #
```

```
Enter TEXT message.  End with the character '#'.
this is a example message#
```

### Related Commands

banner exec

banner motd

## 2.1.14 show version

### Command Purpose

To display the version information of the hardware and firmware, use the show version command in EXEC mode.

### Command Syntax

show version ( slot *ID* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ID | slot id | 1-29 |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following example shows how to display version information of the hardware and firmware:

```
Switch# show version
Switch# show version
```

```
NetworkOS Software, Switch, Version 5.3.8.5
Copyright (C) 2018 Switch Vendor Inc.  All rights reserved.
The current running image is flash:/boot/uImage.p1010.48t4x.r_20181115

Switch uptime is 0 days, 19 hours, 8 minutes
Hardware Type is 52TX
Hardware Version is 1.1
SDRAM size 2048M
Flash size 2048M
EPLD Version is 2.1
BootRom Version is 6.1.2
System serial number is E101ZB14202C
Current Web Version is 5.3.8.3
```

### Related Commands

None

## 2.1.15 line vty maximum

### Command Purpose

To set the max login VTY, use this command in Global Configuration. To restore the configuration to the default, use the no form of this command.

### Command Syntax

line vty maximum *MAX_VTY*

no line vty maximum

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MAX_VTY | Max login VTY | The default value is 8.range <0-8> |

### Command Mode

Global Configuration

### Default

8

### Usage

None

### Examples

The following example shows how to set the max VTY to 5:

```
Switch# configure terminal
Switch(config)# line vty maximum 5
```

### Related Commands

None

## 2.1.16 line vty

### Command Purpose

To enter Line Configuration mode, use this command in Global Configuration.

### Command Syntax

line vty *VTY*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VTY | Number of VTY | Range <0-7> |

### Command Mode

Global Configuration

### Default

None

### Usage

None

### Examples

The following example shows how to enter Line Configuration mode:

```
Switch# configure terminal
Switch(config)#  line vty 2
```

### Related Commands

None

## 2.1.17 line-password

### Command Purpose

This command to set the password for the vty user interface.

Use the no form of this command to

### Command Syntax

line-password *LINE*

no line-password

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LINE | The password string | String length [1,64), Support special character |

### Command Mode

Line Configuration

### Default

None

### Usage

If this command is set, user need to provide the password when enter vty interface.

### Examples

The following example shows how to set the password:

```
Switch# configure terminal
Switch(config)# line vty 0 7
Switch(config-line)# line-password abc
Switch(config-line)# exit
```

### Related Commands

None

## 2.1.18 exec-timeout

### Command Purpose

To set how much time the login user do not do any operation then the user should be forced to quit, use the no form of this command.

### Command Syntax

exec-timeout *MINUTES SECONDS*

no exec-timeout

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MINUTES | Timeout in minute | Range <0-35791> |
| SECONDS | Timeout in second | Range <0-2147483> |

### Command Mode

Line Configuration

### Default

600 seconds

### Usage

When the user login again then config will be effected

## Examples

The following example shows how to set max time the login user do not do any operation then the user should be forced to quit:

```
Switch# configure terminal
Switch(config)# line vty 0
Swicth(config-line)# exec-timeout 3 200
```

## Related Commands

None

# 2.1.19 access-class

## Command Purpose

To apply IPv4 ACL on line vty. To restore to default, use the no form of this command.

## Command Syntax

access-class *ACL-NAME* in

no access-class in

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ACL-NAME | The name of the IPv4 acl | A string with up to 40 characters |

## Command Mode

Line Configuration

## Default

No ACL

## Usage

If an ACL be applied to line VTY, none of the entries in the ACL will be matched except for IP address and port number.

### Examples

The following example shows how to apply IPv4 ACL on vty:

```
Switch(config-line)# access-class acl4 in
```

### Related Commands

ip access-list

## 2.1.20 ipv6 access-class

### Command Purpose

To apply IPv6 ACL on line vty. To restore to default, use the no form of this command.

### Command Syntax

ipv6 access-class *ACL-NAME* in

no ipv6 access-class in

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ACL-NAME | The name of the IPv6 acl | A string with up to 40 characters |

### Command Mode

Line Configuration

### Default

No ACL

### Usage

If an ACL be applied to line VTY, none of the entries in the ACL will be matched except for IP address and port number.

### Examples

The following example shows how to apply IPv6 ACL on vty:

```
Switch(config-line)# ipv6 access-class aclv6 in
```

### Related Commands

ipv6 access-list

## 2.1.21 reboot

### Command Purpose

To reload the operating system, use the reload command in Privileged EXEC mode.

### Command Syntax

reboot

### Command Mode

Privileged EXEC

### Default

None

### Usage

The reboot command halts the system. Use the reboot command after configuration information is entered into a file and saved to the startup configuration.

### Examples

The following example is sample dialog from the reboot command:

```
Switch# reboot
```

### Related Commands

reload

## 2.1.22 schedule reboot at

### Command Purpose

To schedule a reload of the software to take place at the specified time, use the schedule reboot at command in Global Configuration. To cancel the scheduled reboot task, use the no form of this command.

### Command Syntax

schedule reboot at *HH:MM* ( *MM/DD* | *MM/DD/YYYY* | *YYYY/MM/DD* )

no schedule reboot

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| HH:MM | The hour and minutes | The time range is 00:00 - 23:59 |
| MM/DD | Specify the date for current year (MM/DD format) | date range is [1/1, 12/31] |
| MM/DD/YYYY | Specify the date (MM/DD/YYYY format, year range is [2000, 2037]) | year range is [2000, 2037] |
| YYYY/MM/DD | Specify the date (YYYY/MM/DD format) | year range is [2000, 2037] |

### Command Mode

Global Configuration

### Default

No scheduled reboot task is defined.

### Usage

If you specify the month and day, the reload is scheduled to take place at the specified time and date. If you do not specify the month and day, the reload takes place at the specified time on the current day.

### Examples

The following example is sample dialog from the schedule reboot at command:

```
Switch# configure terminal
Switch(config)# schedule reboot at 12:12 2008/12/25
```

### Related Commands

schedule reboot delay

## 2.1.23 schedule reboot delay

### Command Purpose

To schedule a reload of the software to take place after the specified time, use the schedule reboot delay command in Global Configuration. To cancel the scheduled reboot task, use the no form of this command.

### Command Syntax

schedule reboot delay { *HH:MM* | *MINUTES* }

no schedule reboot

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| HH:MM | The hour and minutes | The time range is 00:00 - 23:59 |
| MINUTES | The minutes | The range is 1-720 |

### Command Mode

Global Configuration

### Default

No scheduled reboot task is defined.

### Usage

None

### Examples

The following example is sample dialog from the schedule reboot delay command:

```
Switch# configure terminal
Switch(config)# schedule reboot delay 300
```

### Related Commands

schedule reboot at

## 2.1.24 boot system

### Command Purpose

To specify the system image that the switch loads at startup, use the following boot system commands in Privileged EXEC mode.

### Command Syntax

boot system ( *tftp:* mgmt-if *SERVERIP* | *flash:/* ) *FILE_NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| flash:/ | System image file for next booting | - |
| tftp | System image file for next booting | - |
| mgmt-if | Management port | - |
| SERVERIP | The tftp server ip | - |
| FILE_NAME | The file name that will be used to load at startup | The full path and file name , up to 255 characters |

### Command Mode

Privileged EXEC

### Default

None

### Usage

Management IP address in startup-config file will be used as source address when system boot via TFTP.

### Examples

The following example is sample dialog from the boot system command:

```
Switch# boot system flash:/boot/Internal-1.0.0.25.bin
```

### Related Commands

show boot

## 2.1.25 show boot

### Command Purpose

To display the current image and the image the next startup will load, use the show boot command in Privileged EXEC mode.

### Command Syntax

show boot

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following is sample output from the show boot command:

```
Switch# show boot
The current boot image version is: E330-3.0.0.23.it
The current running image is: tftp://10.10.29.160/humberOS-e330-ma-
v3.0.0.23.it.r.bin
The next running image is: tftp://10.10.29.160/humberOS-e330-ma-v3.0.0.23.it.r.bin
```

### Related Commands

show boot images

## 2.1.26 show boot images

### Command Purpose

To display all booting images available in the flash system, use the show boot images command in Privileged EXEC mode.

### Command Syntax

show boot images

### Command Mode

Privileged EXEC

### Default

None

## Usage

None

## Examples

The following is sample output from the show boot images command:

```
Switch# show boot images
System image files list:
Current boot image version: 1.0.0.25
    Create Time          Version                File name
================================================================
* 2011-07-25 10:58:29  v3.0.0.22it            Internal-.00.22.bin
```

## Related Commands

show boot

# 2.1.27 show memory

## Command Purpose

To display memory utilization information about the active processes, use the show memory command in Privileged EXEC mode.

## Command Syntax

show memory ( all | bgp | bhm | chsm | dhclient | dot1x | imi | ipv6 | lacp | ldp | lib | mstp | nsm | oamd | onmd | ospf | pim | ptp | rip | rsvp | shal | summary )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| all | All memory information | - |
| bgp | Border Gateway Protocol (BGP) | - |
| bhm | Health monitoring | - |
| chsm | Chassis management | - |
| dhclient | DHCP client module | - |
| dhcpd | DHCP | - |
| dhcprelay | DHCP relay | - |
| dhcprelay6 | DHCP relay6(IPv6) | - |

| | | |
|---|---|---|
| dot1x | IEEE 802.1X Port-Based Access Control | - |
| imi | Integrated Management Interface (IMI) | - |
| ipv6 | Internet Protocol version 6 (IPv6) | - |
| lacp | Link Aggregation Control Protocol (LACP) | - |
| ldp | Label Distribution Protocol (LDP) | - |
| lib | Library information | - |
| mstp | Spanning Tree Protocols (STP/RSTP/MSTP) | - |
| nsm | Network Service Module (NSM) | - |
| oamd | Bidirectional Forwarding Detection (BFD) | - |
| onmd | LLDP and EFM_OAM | - |
| ospf | Open Shortest Path First (OSPF) | - |
| pim | Protocol Independent Multicast (PIM) | - |
| ptp | Precision Time Protocol (PTP) | - |
| rip | Routing Information Protocol (RIP) | - |
| rsvp | Resource Reservation Protocol (RSVP) | - |
| shal | Hal server monitoring | - |
| summary | Summary memory information | - |
| monitor | monitor | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following is sample output from the show memory command with keyword bgp:

```
Switch# show memory bgp
Library memories for BGP
Memory type                          Alloc cells   Alloc bytes
============================== ============ ==============
Temporary memory                :        6596          322216
Hash                            :          10             320
Hash index                       :          10           40960
Hash bucket                      :          55             880
Link list                        :          13             400
Link list node                   :         115            1840
Show                            :           1             512
Show page                       :           1            8192
Show server                      :           1              64
Prefix IPv4                      :           6              48
Route table                      :           6              48
Route node                       :         309           19776
Vector                           :        3383          324768
Vector index                     :        3383           48824
SNMP subtree                    :           8            6144
Host config                      :           1              16
Message of The Day               :           1           128
IMI Client                       :           2            1056
VTY master                       :           1              16
VTY if                           :          52           39936
VTY connected                    :           3             192
Message handler                  :           2             128
Host                             :           1              96
Log information                  :           2             128
Context                          :           1             512
Memories for BGP
Memory type                            Alloc cells   Alloc bytes
============================== ============= ===============
BGP structure                    :           1             768
BGP VR structure                 :           1             384
BGP global structure             :           1              64
BGP peer                         :           1            2048
Ext community                    :           1              16
BGP as list master               :           1              32
Community list handler           :           1              32
BGP Damp Reuse List Array        :           1            2048
BGP table                        :          31             248
BGP VRF list                     :           1              64
```

## Related Commands

show processes memory sorted

## 2.1.28 show cpu traffic-limit

### Command Purpose

Use this command to show the CPU traffic-limit configurations.

### Command Syntax

show cpu traffic-limit

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following is sample output from the show cpu traffic-limit :

```
Switch# show cpu traffic-limit
reason                      rate (pps)    class
bpdu                        64             3
cfm                         512            2
slow-protocol               128            1
eapol                       128            0
erps                        128            2
smart-link                  128            2
udld                        128            3
arp                         640            1
dhcp                        128            0
rip                         64             1
ldp                         512            1
ospf                        256            1
pim                         128            1
vrrp                        512            1
rsvp                        512            1
ipda                        1024           0
icmp-redirect               128            0
```

```
mcast-rpf-fail              128           1
macsa-mismatch              128           0
port-security-discard       128           0
vlan-security-discard       128           0
mtu-dontfrag                64            0
mtu-frag                    64            0
ptp                         512           2
ip-option                   512           0
ucast-ttl-fail              64            0
mpls-ttl-fail               64            0
igmp                        128           2
sflow-ingress               128           0
sflow-egress                128           0
fwd-to-cpu                  64            0
mpls-tp-pwoam               128           2
Total rate:      2048 (pps)
```

### Related Commands

None

## 2.1.29 show processes cpu sorted

### Command Purpose

To display CPU utilization information about the active processes sorted by percentage in a device, use the show processes cpu sorted command in Privileged EXEC mode.The first line displays the CPU usage in 5 seconds/interrupted CPU usage in 5 seconds, CPU usage in 1 minute, and CPU usage in 5 minutes. The meanings of the fields in the second row are as follows:

PID: the process ID

Runtime(ms) : the time taken by a process from startup to execution

5Sec: the CPU usage of the process within five seconds

1 minute: the CPU usage of a process in one minute

5 minutes: the CPU usage of a process within five minutes

Process: the process name

Note: It takes about 10 seconds after the system starts to collect running information about all processes. Therefore, process information isn't displayed except the first line within 10 seconds after the system starts

## Command Syntax

show process cpu sorted

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following is sample output from the show process cpu sorted :

```
Switch# show processes cpu sorted
CPU utilization for five seconds: 7.44%/0.00%; one minute: 29.64%; five minutes:
29.64%
 PID     Runtime(ms)     5Sec      1Min      5Min      Process
 1       15990           0.00%     12.12%    12.12%    init
 3       20              0.00%     0.02%     0.02%     ksoftirqd/0
 7       160             0.20%     0.12%     0.12%     rcu_sched
 16      30              0.00%     0.02%     0.02%     ksoftirqd/1
 21      20              0.00%     0.02%     0.02%     kworker/u4:1
 344     10              0.00%     0.01%     0.01%     kworker/u4:2
 351     20              0.00%     0.02%     0.02%     khugepaged
 400     1290            0.00%     0.98%     0.98%     kworker/0:1
 488     970             0.00%     0.74%     0.74%     kworker/1:1
 821     390             0.00%     0.30%     0.30%     spi0
 1024    30              0.00%     0.02%     0.02%     mmcqd/0
 1044    210             0.00%     0.16%     0.16%     udevd
 1611    310             0.00%     0.24%     0.24%     syslog-ng
 1633    120             0.00%     0.09%     0.09%     ncagent
 1638    430             0.41%     0.33%     0.33%     ntpd
 1639    2110            0.00%     1.60%     1.60%     sysrepod
 1641    300             0.20%     0.23%     0.23%     stackd
 1651    350             0.10%     0.27%     0.27%     chsm
 1652    5900            1.02%     4.47%     4.47%     hsrvd
 2027    270             0.10%     0.20%     0.20%     sshd
 2052    390             0.41%     0.30%     0.30%     dhcrelay6
 2053    160             0.00%     0.12%     0.12%     dhcpd6
 2055    180             0.00%     0.14%     0.14%     dhclient
 2056    160             0.10%     0.12%     0.12%     dhcrelay6
```

```
2057    230             0.20%     0.17%     0.17%     onmd
2059    160             0.10%     0.12%     0.12%     ssmd
2060    230             0.10%     0.17%     0.17%     monitord
2061    190             0.20%     0.14%     0.14%     ptpd
2065    220             0.20%     0.17%     0.17%     mstpd
2066    190             0.20%     0.14%     0.14%     lacpd
2068    460             0.00%     0.35%     0.35%     snmpd
2072    1110            1.12%     0.84%     0.84%     imi
2077    180             0.20%     0.14%     0.14%     authd
2081    180             0.20%     0.14%     0.14%     pdmd
2082    170             0.20%     0.13%     0.13%     rsvpd
2088    180             0.10%     0.14%     0.14%     bgpd
2151    770             0.31%     0.58%     0.58%     nsm
2153    180             0.20%     0.14%     0.14%     oamd
2154    200             0.31%     0.15%     0.15%     bhm
2155    170             0.20%     0.13%     0.13%     rmond
2156    160             0.10%     0.12%     0.12%     pim6d
2157    160             0.10%     0.12%     0.12%     ldpd
2158    170             0.20%     0.13%     0.13%     pimd
2159    160             0.10%     0.12%     0.12%     ripngd
2160    160             0.20%     0.12%     0.12%     ospf6d
2161    170             0.31%     0.13%     0.13%     ripd
2162    170             0.20%     0.13%     0.13%     isisd
2163    170             0.10%     0.13%     0.13%     ospfd
2302    350             0.10%     0.27%     0.27%     imish
```

### Related Commands

None

## 2.1.30 show processes cpu history

### Command Purpose

To display CPU utilization information for a period of time, use the show processes cpu history command in Privileged EXEC mode, the period of 1s, 1min, 5min could be shown.

### Command Syntax

show process cpu history

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following is sample output from the show processes cpu history command:

```
Switch# show processes cpu history
CPU usage for five seconds: 4.17%; one minute: 3.70%; five minutes: 3.68%
```

### Related Commands

None

## 2.1.31 show processes memory sorted

### Command Purpose

To display memory utilization information about the active processes sorted by percentage in a device, use the show processes memory sorted command in Privileged EXEC mode. Here, CPU usage for each process means the CPU timeslice used by this process from the process was started to this command has been operated.

### Command Syntax

show processes memory sorted ( core | physical | virtual )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| core | Size in physical pages of the core image of the process | - |
| physical | Non-swapped physical memory that a task has used | - |
| virtual | Virtual memory usage of entire process | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following is sample output from the show processes memory sorted command without keywords:

```
Switch# show processes memory sorted
Total: 256108; Used: 89644; Free: 166464; Buffers: 0
  PID TTY      RSS    VSZ    SZ COMMAND
1317 pts/0     9516  13104  3276 imish
1106 ?         9428  13104  3276 imish
1463 pts/0     7436  13104  3276 imish
  956 ?         6836  14644  3661 nsm
 1007 ?         5948   9624  2406 imi
  924 ?         5912  17652  4413 hsrvd
  959 ?         3336   8076  2019 snmpd
 1032 ?         2724   8204  2051bgpd
 1027 ?         2488   7140  1785 ospfd
1003 ?         2472   7152  1788 pimd
  957 ?         2340   6572  1643 dhcrelay
  983 ?         2336   6592  1648 mstpd
 1021 ?         2324   6600  1650 ripd
 1005 ?         2320   6732  1683 ldpd
  942 ?         2284   6772  1693 sshd
  985 ?         2208   6592  1648 onmd
  929 ?         2132   7168  1792 chsm
  966 ?         2028   6140  1535 lacpd
  973 ?         2028   6284  1571 authd
  965 ?         2024   6408  1602 ptpd
  964 ?         1952   6364  1591 oamd
  977 ?         1948   6200  1550 rmond
  963 ?         1708   5980  1495 bhm
  919 ?         1120   3792   948 ntpd
  916 ?         1060   2300   575 syslog-ng
1465 pts/0      764   2516   629 ps
  917 ?          668   3040   760 crond
    1 ?          656   2928   732 init
1464 pts/0      472   1668   417 more
```

```
1096 ?           416   2928   732 telnetd
1098 ?           272   2928   732 telnetd
 912 ?           172   1496   374 angel
   2 ?             0      0     0 kthreadd
   3 ?             0      0     0 ksoftirqd/0
   4 ?             0      0     0 watchdog/0
   5 ?             0      0     0 events/0
   6 ?             0      0     0 khelper
   9 ?             0      0     0 netns
  10 ?             0      0     0 async/mgr
  63 ?             0      0     0 sync_supers
  65 ?             0      0     0 bdi-default
  66 ?             0      0     0 kblockd/0
  73 ?             0      0     0 kseriod
  88 ?             0      0     0 rpciod/0
 105 ?             0      0     0 khungtaskd
 106 ?             0      0     0 kswapd0
 157 ?             0      0     0 aio/0
 164 ?             0      0     0 nfsiod
 171 ?             0      0     0 crypto/0
 712 ?             0      0     0 mtdblockd
 741 ?             0      0     0 kpsmoused
 779 ?             0      0     0 jffs2_gcd_mtd1
 789 ?             0      0     0 PETH/Tx
```

### Related Commands

None

## 2.1.32 terminal monitor

### Command Purpose

To copy debug output to the current terminal line, use the terminal monitor command in Privileged EXEC mode.

### Command Syntax

terminal monitor

terminal no monitor

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following is sample output from the terminal monitor command:

```
Switch# terminal monitor
Jan  1 16:09:30 DUT1 IMISH-6: ready to service
```

### Related Commands

None

## 2.1.33 configure terminal

### Command Purpose

To enter Global Configuration, use configure terminal command in Privileged EXEC mode.

### Command Syntax

configure terminal

### Command Mode

Privileged EXEC

### Default

None

### Usage

Use this command to enter Global Configuration. Note that commands in this mode are written to the running configuration file as soon as you enter them (using the Enter key/Carriage Return).

After you enter the configure command, the system prompt changes from # to (config)#, indicating that the switch is in Global Configuration. To leave Global Configuration and return to Privileged EXEC mode, type end or press Ctrl-Z.

### Examples

In the following example, the user enters Global Configuration:

```
Switch# configure terminal
Switch(config)#
Enter configuration commands,  one per line. End with CNTL/Z.
Switch(config)#
```

### Related Commands

enable

disable

## 2.1.34 disable

### Command Purpose

To exit Privileged EXEC mode and return to user EXEC mode, enter the disable command in EXEC mode.

### Command Syntax

disable

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

In the following example, the user enters Privileged EXEC mode using the enable command, then exits back to user EXEC mode using the disable command. Note that the prompt for user EXEC mode is >, and the prompt for Privileged EXEC mode is #:

```
Switch# configure terminal
Switch> enable
Password: <password>
Switch# disable
Switch>
```

### Related Commands

enable

## 2.1.35 enable

### Command Purpose

To enter Privileged EXEC mod, use the enable command in user EXEC or Privileged EXEC mode.

### Command Syntax

enable

### Command Mode

User EXEC

Privileged EXEC

### Default

None

### Usage

None

### Examples

In the following example, the user enters Privileged EXEC mode using the enable command. The system prompts the user for a password before allowing access to the Privileged EXEC mode. The password is not printed to the screen. The user then exits back to user EXEC mode using the disable command. Note that the prompt for user EXEC mode is the greater than symbol (>), and the prompt for Privileged EXEC mode is the number sign (#).:

```
Switch# configure terminal
Switch> enable
Password: <password>
Switch# disable
Switch>
```

### Related Commands

disable

## 2.1.36 end

### Command Purpose

To end the current configuration session and return to Privileged EXEC mode, use the end command in Global Configuration.

### Command Syntax

end

### Command Mode

Global Configuration

## Default

None

## Usage

This command will bring you back to Privileged EXEC mode regardless of what configuration mode or configuration sub-mode you are in.

This global configuration command can be used in any configuration mode.

Use this command when you are done configuring the system and you want to return to EXEC mode to perform verification steps.

## Examples

In the following example, the end command is used to exit from interface configuration mode and return to Privileged EXEC mode. A show command is used in Privileged EXEC mode to verify the configuration:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# end
Switch# show interface eth-0-1
```

## Related Commands

exit

# 2.1.37 exit (global)

## Command Purpose

To exit any configuration mode to the lower mode in the CLI mode hierarchy, use the exit command in any configuration mode.

## Command Syntax

exit

### Command Mode

All Configuration Mode

### Default

None

### Usage

The exit command is used in the CLI to exit from the current command mode to the lower mode in the CLI mode hierarchy.

For example, use the exit command in Global Configuration to return to Privileged EXEC mode. Use the exit command in interface, line, or router configuration mode to return to Global Configuration.

### Examples

The following example displays an exit from the interface configuration mode to return to the Global Configuration:

```
Switch# configure terminal
Switch(config-if)# exit
Switch(config)#
```

### Related Commands

end

exit (EXEC)

## 2.1.38 exit (EXEC)

### Command Purpose

To close an active terminal session by logging off the switch, use the exit command in EXEC mode.

### Command Syntax

exit

### Command Mode

Privileged EXEC

### Default

None

### Usage

Use the exit command in EXEC mode to exit the active session (log off the device). This command can be used in any EXEC mode (such as User EXEC mode or Privileged EXEC mode) to exit from the EXEC process.

### Examples

In the following example, the exit (global) command is used to move from Global Configuration to Privileged EXEC mode, the disable command is used to move from Privileged EXEC mode to user EXEC mode, and the exit (EXEC) command is used to log off (exit the active session):

```
Switch# configure terminal
Switch(config)# exit
Switch# disable
Switch> exit
```

### Related Commands

quit

## 2.1.39 quit

### Command Purpose

To close an active terminal session by logging off the switch, use the quit command in EXEC mode.

## Command Syntax

quit

## Command Mode

All Configuration Mode

## Default

None

## Usage

Use the quit command in EXEC mode to exit the active session (log off the device). This command can be used in any EXEC mode (such as User EXEC mode or Privileged EXEC mode) to exit from the EXEC process.

## Examples

In the following example, the quit command is used to move from Global Configuration to Privileged EXEC mode, the disable command is used to move from Privileged EXEC mode to user EXEC mode, and the quit command is used to log off (exit the active session):

```
Switch# configure terminal
Switch(config)# quit
Switch# disable
Switch> quit
```

## Related Commands

exit

# 2.1.40 cd

## Command Purpose

Change the current directory to dir, use the cd command in EXEC mode.

## Command Syntax

cd ( dir | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| dir | (Optional) The directory or file systems followed by a colon. If flash: argument is specified, change the current directory to flash: . If udisk: argument is specified, change the current directory to udisk:. If you don't use USB device, failed to cd udisk | - |

## Command Mode

Privileged EXEC

## Default

The initial default file system is flash:. If you do not specify a directory on a file system, the default is the root directory on that file system.

## Usage

For all EXEC commands that have an optional file system argument, the system uses the file system specified by the cd command when you omit the optional file system argument. For example, the dir EXEC command, which displays a list of files on a file system, contain an optional file system argument. When you omit this argument, the system lists the files on the file system specified by the cd command.

## Examples

In the following example, the cd command is used to set the default file system to the Flash memory.:

```
Switch# configure terminal
DUT1# cd
DUT1# pwd
flash:/
```

In the following example, the cd command is used to set the default file system to the USB device:

```
Switch# configure terminal
storage device
DUT1# cd udisk:
DUT1# pwd
udisk:/
```

In the following example, the cd command is used to set the file system without plug in the USB mass storage device:

```
Switch# cd udisk:
% Failed to cd udisk:: No such file or directory
In the following example, the cd command is used to set the file system with plug
in the USB mass storage device
```

### Related Commands

dir

ls

pwd

## 2.1.41 copy

### Command Purpose

To copy file system, use the copy command in Privileged EXEC mode.

### Command Syntax

copy source-name destination-name

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| source-name | The location URL of the source file to be copied. The source can be either local or remote | - |
| destination-name | The destination URL of the copied file. The destination can be either local or remote | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

The exact format of the source and destination URLs varies according to the file or directory location. You may enter a particular file or a filename that follows the standard file system syntax (filesystem:[/filepath][/filename]).

## Examples

The following example shows how to get image from TFTP server through in band management interface.:

```
Switch# copy tftp://192.168.0.1/image flash:/boot/image
Download from URL to temporary file.
Get file from tftp://192.168.0.1/image
.....................................................................................
.......................
Received 15591515 bytes in 16.6 seconds
Copy the temporary file to its destination.
.....................................................................................
.......................
15591515 bytes in 69.8 seconds, 218 kbytes/second
```

The following example shows how to get image from TFTP server through out band management interface:

```
Switch# copy mgmt-if tftp://192.168.0.1/image flash:/boot/image
```

## Related Commands

delete

# 2.1.42 delete

## Command Purpose

To delete a file on the flash, use the delete command in Privileged EXEC mode.

## Command Syntax

delete file-name

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| file-name | The file name that is supposed to be deleted | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

If you attempt to delete the configuration file or image, the system prompts you to confirm the deletion. Also, if you attempt to delete the system specified file such as DHCP snooping bindings, the system prompts you to confirm the deletion.

## Examples

The following example deletes the file named test from the flash:

```
Switch# delete flash:/test
Are you sure to delete flash:/test? [confirm]:y
```

## Related Commands

copy

# 2.1.43 dir

## Command Purpose

To display a list of files on a file system, use the dir command in EXEC mode.

## Command Syntax

dir ( *flash:* | *udisk:* | ) ( directory-name | ) ( file-name | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| flash | The flash system | - |
| udisk | The USB mass storage device. If you don't use USB mass storage device, failed to dir udisk | - |
| directory-name | The directory in flash or udisk | - |
| file-name | The file name | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

Use the dir (Flash file system) command to display flash or udisk information.

## Examples

The following is sample output from the dir command.:

```
Switch# dir
Directory of flash:/
total 42
drwxr-xr-x  2     0 Jul 30 15:42 boot
drwxr-xr-x  3     0 Jan  1  1970 conf
drwxr-xr-x  2     0 Jan  1  1970 log
-rw-r-----  1  1020 Jul 29 19:18 startup-config.conf
-rw-r--r--  1 10270 Jul 30 10:10 syslog
-rw-r--r--  1  6886 Jul 29 23:59 syslog.1.gz
63.0M bytes total (30.4M bytes free)
Switch # cd udisk:
Switch # dir
Directory of udisk:/
total 12
drwxrwxrwx 2 4096 Jun  2  2011test
drwxrwxrwx 2 4096 Jun  8  2011test1
```

```
drwxrwxrwx 2 4096 Jun  7  2011test2
3.7G bytes total (3.7G bytes free)
```

The following is sample output from udisk if plug in the USB mass storage device.:

```
Switch# cd udisk:
Switch# dir
Directory of udisk:/

total 12
drwxrwxrwx 2 4096 Jun  2  2011 test
drwxrwxrwx 2 4096 Jun  8  2011 test1
drwxrwxrwx 2 4096 Jun  7  2011 test2
3.7G bytes total (3.7G bytes free)
```

### Related Commands

ls

## 2.1.44 ls

### Command Purpose

To display a list of files on a file system, use the ls command in EXEC mode.

### Command Syntax

ls ( *flash:* | *udisk:* | ) ( directory-name | ) ( file-name | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| flash | The flash system | - |
| udisk | The USB mass storage device. If you don't use USB mass storage device, failed to dir udisk | - |
| directory-name | The directory in flash or udisk | - |
| file-name | The file name | - |

### Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following is sample output from the ls command:

```
Switch# ls
Directory of flash:/
total 42
drwxr-xr-x  2     0 Jul 30 15:42 boot
drwxr-xr-x  3     0 Jan  1  1970 conf
drwxr-xr-x  2     0 Jan  1  1970 log
-rw-r-----  1  1020 Jul 29 19:18 startup-config.conf
-rw-r--r--  1 10270 Jul 30 10:10 syslog
-rw-r--r--  1  6886 Jul 29 23:59 syslog.1.gz
63.0M bytes total (30.4M bytes free)
```

## Related Commands

dir

# 2.1.45 more

## Command Purpose

To display the contents of a file, use the more command in EXEC mode.

## Command Syntax

more ( *flash:* | *udisk:* ) ( directory-name | ) file-name

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| flash | The flash system | - |
| udisk | The USB mass storage device. If you don't use USB mass storage device, failed to dir udisk | - |

| | | |
|---|---|---|
| directory-name | The directory in flash or udisk | - |
| file-name | The file name | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

The system can only display a file in ASCII format.

## Examples

The following partial sample output displays the configuration file named startup-config in flash:

```
Switch# more flash:/startup-config.conf
```

## Related Commands

dir

ls

# 2.1.46 mkdir

## Command Purpose

To create a new directory in a Flash file system or udisk device, use the mkdir command in EXEC mode.

## Command Syntax

mkdir directory-name

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| directory-name | The directory in flash or udisk | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

This command is valid only for local file systems.

## Examples

The following example creates a directory named newdir in Flash.:

```
Switch# mkdir flash:/newdir
```

The following example creates a directory named newdir in USB mass storage device if plug in it:

```
Switch# mkdir udisk:/newdir
```

## Related Commands

rmdir

dir

# 2.1.47 rename

## Command Purpose

To rename a file in a Class C Flash file system or udisk device, use the rename command in EXEC mode.

## Command Syntax

rename old-filename new-filename

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| old-filename | The original file name in flash | - |
| new-filename | The new file name in flash | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

This command is valid only for local file systems

## Examples

In the following example, the file named startup-config.conf-bak is renamed startup-config.conf-bak2:

```
Switch# configure terminal
Switch1# rename udisk:/wus udisk:/wu
Are you sure to rename udisk:/wus? [confirm]
```

## Related Commands

None

# 2.1.48 rmdir

## Command Purpose

To remove an existing directory in a Flash file system or udisk device, use the rmdir command in Privileged EXEC mode.

## Command Syntax

rmdir directory-name

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| directory-name | The directory in flash | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

This command is valid only for local file systems

## Examples

The following example deletes a directory named newdir:

```
Switch# rmdir flash:/newdir
Are you sure to delete newdir? [yes/no]: y
```

## Related Commands

mkdir

dir

# 2.1.49 tar create

## Command Purpose

To create an new tar file in a Flash file system or udisk device, use the tar create command in Privileged EXEC mode.

## Command Syntax

tar create tar-file-name source-directory

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| tar-file-name | The file name of the new tar file | - |
| source-directory | The source directory in flash | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

The source-directory must be a directory

## Examples

The following example creates a tar file named tar1:

```
Switch# tar create udisk:/tar1 udisk:/wu
```

## Related Commands

tar table

tar xtract

# 2.1.50 tar table

## Command Purpose

To display files in the tar file, use the tar table command in Privileged EXEC mode.

## Command Syntax

tar table tar-file-name

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| tar-file-name | The file name of the new tar file | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

The tar-file-name must be a in the flash

## Examples

The following example shows files in a tar file named tar1:

```
Switch# tar table udisk:/tar1
```

## Related Commands

tar create

# 2.1.51 tar xtract

## Command Purpose

To untar files in the tar file, use the tar xtract command in Privileged EXEC mode.

## Command Syntax

tar xtract tar-file destination-directory

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| tar-file | The file name of the tar file | - |
| destination-directory | The destination directory | - |

### Command Mode

Privileged EXEC

### Default

None

### Usage

The destination-directory must exist in the flash. You can use mkdir to create a new directory

### Examples

The following shows an example to extract a tar file named tar1 into a directory name dir1:

```
Switch# tar xtract flash:/tar1 flash:/mydir
```

### Related Commands

tar create

tar table

## 2.1.52 show diagnostic-information

### Command Purpose

Display diagnstic-information including syslog files, core dump files, tcam entries ,running-config, startup-config, version, clock, memory and logging buffer.

### Command Syntax

show diagnostic-information ( bgp | ospf | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| bgp | BGP protocol diagnostic information | - |

| | | |
|---|---|---|
| ospf | OSPF protocol diagnostic information | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following example show diagnostic-information:

```
Switch# show diagnostic-information
```

## Related Commands

None

# 2.1.53 tar diagnostic-information

## Command Purpose

To put diagnostic-information to a Flash file system ,udisk device, ftp server or tftp server, use the tar diagnostic-information command in Privileged EXEC mode. Syslog files, core dump files, tcam entries ,running-config, startup-config, version, clock, memory and logging buffer are included in this tarfile.

## Command Syntax

tar diagnostic-information ( mgmt-if | ) *destination-directory/* tar-file

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| destination-directory | The destination directory, such as flash, udisk, tftp or ftp server | - |
| tar-file | The file name of the tar file | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

The destination-directory must reachable and disk is enough

## Examples

The following shows an example to put a diagnostic-information tar file to flash:

```
Switch# tar diagnostic-information flash:/diag.tar.gz
```

## Related Commands

None

# 2.1.54 format

## Command Purpose

To format udisk, all data on udisk: will be lost.

## Command Syntax

format *udsik:*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| udsik: | The USB mass storage device. If you don't use USB mass storage device, failed to format udisk | - |

## Command Mode

Application Configuration

## Default

None

## Usage

The destination-directory must exist

## Examples

The following shows an example to format USB mass storage device:

```
Switch# configure terminal
Switch(config)# format udisk:
   WARNING: All data on udisk: will be lost!!!
And format operation may take a while.
Are you sure to process with format? [yes/no]: yes
```

## Related Commands

None

# 2.1.55 umount

## Command Purpose

To uninstall the USB mass storage device before plug out it from the switch.

## Command Syntax

umount *udsik:*

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| udisk: | The USB mass storage device. If you don't use USB mass storage device, failed to format udisk | - |

### Command Mode

Application Configuration

### Default

None

### Usage

USB mass storage device must exist in the system. You can use umount command to uninstall the USB mass storage device

### Examples

The following shows an example to umount USB mass storage device:

```
Switch# configure terminal
Switch(config)# umount udisk:
After this operation, you can not use USB disk.
Are you sure to continue? [yes/no]: yes
```

### Related Commands

None

## 2.1.56 cut-through enable

### Command Purpose

To enable cut through mode, and can configure speed only on GG truck .

### Command Syntax

*cut_through_forwarding* enable ( *10G* | *100G* | *1G* | *25G* | *2G5* | *40G* | *50G* | *5G* )

no *cut_through_forwarding* enable

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| enbale | enable cut through mode | - |
| (10G\|100G\|1G\|25G\|2G5\|40G\|50G\|5G) | Configure cut_through speed | - |

## Command Mode

Application Configuration

## Default

None

## Usage

None

## Examples

The following example shows how to configure cut through mode:

```
Switch# configure terminal
Switch(config)# cut-through-forwarding enable 10G
% Configuration about cutting through forwarding mode has been stored, but cannot
take effect until the next reload.
```

## Related Commands

None

# 2.1.57 show cut-through-forwarding mode

## Command Purpose

To display current working mode.

## Command Syntax

show cut-through-forwarding mode

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following shows an example to display current working mode:

```
DUT1# show cut-through-forwarding mode
```

### Related Commands

None

## 2.1.58 reset factory-config

### Command Purpose

Reset to factory configuration.

### Command Syntax

reset factory-config

### Command Mode

Privileged EXEC

### Default

None

### Usage

Device will restore the saved configuration to factory configuration when select yes, and prompt to save configuration when rebooting, please select NO.

### Examples

The following shows an example to reset factory configuration:

```
Switch# configure terminal
DUT1# reset factory-config

This action will reset the saved configuration immediately.
Running-config will be erased after reboot. Continue? [yes/no]:
```

### Related Commands

None

## 2.1.59 show factory-config

### Command Purpose

To display the factory configuration.

### Command Syntax

show factory-config

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following shows an example to display factory configuration DUT1# show factory-config :

```
DUT1# show factory-config
```

### Related Commands

None

## 2.1.60 show this

### Command Purpose

To display the configuration of this mode.

### Command Syntax

show this

### Command Mode

All Configuration Mode

### Default

None

### Usage

Not support this mode：key-chain，key-chain key，time range，acl，route-map，line，class map

### Examples

The following example show the configuration of this mode:

```
Switch(config-vlan)# show this
vlan database
```

```
 vlan 5
!
```

### Related Commands

None

## 2.1.61 show route-mac

### Command Purpose

To display the route MAC address of this device.

### Command Syntax

show route-mac

### Command Mode

Privileged EXEC

### Default

None

### Usage

All interfaces on a device share the same single route-mac.

### Examples

The following shows an example to display route-mac of this device:

```
Switch# show route-mac
Route MAC is: 222c.12fd.6c00

!
```

### Related Commands

None

## 2.1.62 show history

### Command Purpose

To display the history command lines, use the show history command in EXEC mode.

### Command Syntax

show history

### Command Mode

Privileged EXEC

### Default

None

### Usage

Use this command to display the history command lines.

### Examples

This example shows how to display history commands information of device:

```
Switch# show history
   1 configure terminal
   2 interface eth-0-1
   3 no shutdown
   4 exit
   5 show version
```

### Related Commands

None

## 2.1.63 write

### Command Purpose

To save the current configuration information

### Command Syntax

write ( file | memory | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| file | save the configuration to a file | - |
| memory | save the configuration to the NVRAM of the switch | - |

### Command Mode

Privileged EXEC

### Default

None

### Usage

you can modify the current configuration of the device through the cli, but the configuration is temporary. If you want to use the current configuration, it will take effect when the system restarts the next time.You need to save the current configuration to the configuration file before restarting the device

### Examples

This example shows how to save the current configuration:

```
Switch# write
Building configuration...
[OK]
```

### Related Commands

None

## 2.1.64 write terminal

### Command Purpose

To view the effective configuration parameters of the device

### Command Syntax

write terminal

### Command Mode

Privileged EXEC

### Default

None

### Usage

if you need to verify a set of configurations,you can run this command to view the parameters that take effect

### Examples

view all configuration information:

```
Switch# write terminal
split interface eth-0-1 10giga
!
!
no service password-encryption
!
!
vlan database
!
interface eth-0-1/1
 no switchport
 ip address 1.1.1.10/24
```

```
!
interface eth-0-1/2
!
interface eth-0-1/3
```

### Related Commands

None

## 2.1.65 show running-config

### Command Purpose

To show information of current configuration

### Command Syntax

show running-config

### Command Mode

Privileged EXEC

### Default

None

### Usage

if you need to verify a set of configurations,you can run this command to view the parameters that take effect

### Examples

view all configuration information that include string of 'vlan':

```
Switch# show running-config | include vlan
vlan database
 vlan 4
```

## Related Commands

None

# 2.1.66 upload config ftp

## Command Purpose

Use this command to enable the switch to periodically upload configuration files to the specified FTP server. Use the 'no' form of this command to delete the configuration.

## Command Syntax

upload config ftp (mgmt-if|vrf WORD) (time TIME|) (user-name USER_NAME password PASS_WORD)server-ip SERVER_IP (remote-path REMOTE_FILE)

no upload config

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| WORD | Name of VRF | - |
| TIME | The period of uploading | <60-4294967295>，默认为 60 秒 |
| SERVER_IP | IPv4 address of the FTP Server | - |
| REMOTE_FILE | The folder designated on the server to store configuration files | - |
| USER_NAME | The username used to access the FTP server. | - |
| PASS_WORD | The password used to access the FTP server. | - |

## Command Mode

Global Configuration

## Default

None

## Usage

Use this command to enable the switch to periodically upload configuration files (including running config and startup config) to the specified FTP server.

## Examples

Configure to upload configuration to FTP Server 192.168.1.101 on a scheduled basis.

```
Switch(config)# upload config ftp mgmt-if user-name admin pass-word admin server-ip
  192.168.1.101
```

## Command Purpose

None

# 2.1.67 upload config tftp

## Command Purpose

Use this command to enable the switch to periodically upload configuration files to the specified TFTP server. Use the 'no' form of this command to delete the configuration.

## Command Syntax

upload config tftp (mgmt-if | vrf WORD) (time TIME|) server-ip SERVER_IP (remote-path REMOTE_FILE)

no upload config

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| WORD | Name of VRF | - |
| TIME | The period of uploading | <60-4294967295>, default：60s |
| SERVER_IP | IPv4 address of the TFTP Server | - |
| REMOTE_FILE | The folder designated on the server to store configuration files | - |

### Command Mode

Global Configuration

### Default

None

### Usage

Use this command to enable the switch to periodically upload configuration files (including running config and startup config) to the specified TFTP server.

### Examples

Configure to upload configuration to TFTP Server 192.168.1.101 on a scheduled basis.

```
Switch(config)# upload config tftp mgmt-if server-ip 192.168.1.101
```

### Related Commands

None

## 2.2 User Management Commands

### 2.2.1 username

### Command Purpose

Use this command to create or delete a local user account on the switch.

### Command Syntax

username *WORD*

no username *WORD*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| username | Establish User Name Authentication | - |

| | | |
|---|---|---|
| WORD | User name | - |

### Command Mode

Global Configuration

### Default

None

### Usage

None

### Examples

This is a sample output from this command displaying how to add a user named testName:

```
Switch# configure terminal
Switch(config)#username testName
```

### Related Commands

None

## 2.2.2 username password

### Command Purpose

Use this command to add username and password.

### Command Syntax

username *WORD* password ( 8 | ) *LINE*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| WORD | User name | - |
| Password | Password for username | - |
| (8\|) | Specifies a hidden password will follow | - |

| | | |
|---|---|---|
| LINE | User password string | - |

## Command Mode

Global Configuration

## Default

None

## Usage

None

## Examples

This is a sample output from this command displaying how to add a user named testName and with the password of 123456:

```
Switch# configure terminal
Switch(config)# username testName password 123456
```

## Related Commands

None

# 2.2.3 username secret

## Command Purpose

Use this command to add username and password and the password will be encrypted by the switch.

## Command Syntax

username *WORD* secret *LINE*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| WORD | User name | - |
| secret | Specify the secret for the user | - |

| | | |
|---|---|---|
| LINE | User privilege level | - |

### Command Mode

Global Configuration

### Default

None

### Usage

None

### Examples

This is a sample output from this command displaying how to add a user named testName and with the password of 123456:

```
Switch# configure terminal
Switch(config)#username testName secret 123456
```

### Related Commands

None

## 2.2.4 username privilege

### Command Purpose

Use this command to set a local user account with privilege level on the switch.

### Command Syntax

username *WORD* privilege <1-4>

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| username WORD | User name | - |
| privilege <1-4> | ser privilege level | - |

## Command Mode

Global Configuration

## Default

None

## Usage

When creating a username, it is usually necessary to specify the privilege level of the user to grant them the authority to manage the switch. There are 4 levels available for configuration, and the following are the permissions corresponding to different levels:

level 1：Can only go to '>' mode and provide basic commands such as ls, dir, ping, ssh, telnet, etc;

level 2：You can enter the '#' mode(Privileged EXEC), provide the show command, and view the switch configuration status;Can execute show running config;

level 3：Can go to global configuration mode to configure switches; The configuration of user AAA, external port, username, etc. cannot be performed, and the show run cannot be viewed;Can execute show running config;

level 4：Have all permissions.

## Examples

This is a sample output from this command displaying how to add a user with privilege level of 2:

```
Switch# configure terminal
Switch(config)#username testName privilege 2
```

## Related Commands

None

## 2.2.5 username service-type

### Command Purpose

Use this command to set the user service type.

### Command Syntax

username *WORD* service-type ( { rpc-api | ssh | telnet | web } | ftp-server } | all | none )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| username WORD | User name | - |
| service-type | User service type(include rpc-api, ssh, telnet, web, ftp-server) | - |

### Command Mode

Global Configuration

### Default

Allow all user service type

### Usage

None

### Examples

This is a sample show how to set only support rpc-api user service-type:

```
Switch# configure terminal
Switch(config)#username testName service-type rpc-api
```

### Related Commands

None

## 2.2.6 username privilege password

### Command Purpose

Use this command to set a local user account with privilege level and password on the switch.

### Command Syntax

username *WORD* privilege <1-4> password ( 8 | ) *LINE*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| WORD | User name | - |
| privilege <1-4> | User privilege level | - |
| 8 | Specifies a HIDDEN password will follow | - |
| LINE | User password string | - |

### Command Mode

Global Configuration

### Default

None

### Usage

None

### Examples

This is a sample output from this command displaying how to add a user with privilege level of 2 and password of 123456:

```
Switch# configure terminal
Switch(config)# username testName privilege 2 password 123456
```

### Related Commands

None

## 2.2.7 re-username newname

### Command Purpose

Use this command to reset username.

### Command Syntax

re-username *WORD* newname *WORD*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| re-username WORD | Old user name | - |
| newname WORD | New user name | - |

### Command Mode

Global Configuration

### Default

None

### Usage

None

### Examples

This is a sample output from this command displaying how to reset username:

```
Switch# configure terminal
Switch(config)# re-username testName newname newname
```

### Related Commands

None

## 2.2.8 cipher detect

### Command Purpose

Use this command to set high level of cipher detect.

### Command Syntax

cipher detect ( strong | normal | none )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| strong | Cipher's length must range form to 63 and must contain two type of digital, normal char and special char | - |
| normal | Cipher's length must range form 8 to 63 | - |
| none | Disable security check | - |

### Command Mode

Global Configuration

### Default

None

### Usage

None

### Examples

This is a sample output from this command displaying how to set high level of cipher detect:

```
Switch# configure terminal
Switch(config)# cipher detect strong
```

### Related Commands

None

## 2.2.9 login-password expire prompt

### Command Purpose

Use this command to set password expire and prompt time.

### Command Syntax

login-password expire <0-365> prompt <0-180>

no login-password expire

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| <0-365> | password expire time（d) | 0-365 |
| <0-180> | password prompt time(d) | 0-180 |

### Command Mode

Global Configuration

### Default

None

### Usage

None

### Examples

This is a sample output from this command displaying how to set expire time 20 prompt time 10:

```
Switch# configure terminal
Switch(config)# login-password expire 20 prompt 10
```

### Related Commands

None

## 2.2.10 login-password history record number

### Command Purpose

Use this command to set password record number.

### Command Syntax

login-password history record number <0-12>

no login-password history record

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| <0-12> | historical password record number | 0-12 |

### Command Mode

Global Configuration

### Default

None

### Usage

None

### Examples

This is a sample output from this command displaying how to set expire time 20 prompt time 10:

```
Switch# configure terminal
Switch(config)# login-password history record number 10
```

### Related Commands

None

## 2.3 FTP Commands

### 2.3.1 ftp

### Command Purpose

To exchange files between local and remote ftp server, use the ftp command in Privileged EXEC mode.

### Command Syntax

ftp ( mgmt-if | ) host ( port *PORTNUM* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| mgmt-if | Management port | - |
| HOST | IPv4, IPv6 address or name of the remote host | Support IPv4/IPv6 address or hostname |
| PORTNUM | port of remote ftp server | 1-65535 |

### Command Mode

Privileged EXEC

### Default

None

### Usage

Use the ftp command to upload and download files from remote ftp server.

### Examples

The following example shows how to connect ftp server by ipv4 address:

```
Switch# ftp mgmt-if 10.10.29.160
Connected to 10.10.29.160.
```

```
220---------- Welcome to Pure-FTPd ----------
220-You are user number 1 of 50 allowed.
220-Local time is now 09:00. Server port: 21.
220-IPv6 connections are also welcome on this server.
220 You will be disconnected after 15 minutes of inactivity.
Name (10.10.29.160:root): root
331 User root OK. Password required
Password:
230-User root has group access to:  wheel    disk     adm      sys      daemon
230- bin      root
230 OK. Current directory is /root
Remote system type is UNIX.
Using binary mode to transfer files.
ftp>
```

The following example shows how to connect ftp server by ipv6 address:

```
Switch# ftp mgmt-if 2001:1000::2

Connected to 2001:1000::2 (2001:1000::2).
220 Serv-U FTP Server v10.2 ready...
Name (2001:1000::2:root): Username
331 User name okay, need password.
Password:
230 User logged in, proceed.
Remote system type is UNIX.
Using binary mode to transfer files.
ftp>
```

### Related Commands

None

## 2.3.2 ftp vrf

### Command Purpose

To exchange files between local and remote ftp server in VPN, use the ftp vrf command in Privileged EXEC mode.

### Command Syntax

ftp vrf *WORD*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| WORD | VPN Routing/Forwarding instance name | A string with 1-31 characters |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

```
Switch# ftp vrf testvrf
```

### Related Commands

None

## 2.3.3 ftp passive

### Command Purpose

To set the FTP mode in passive mode, use the ftp passive command in Global Configuration. To restore the configuration to the default, use no form of this command.

### Command Syntax

ftp passive

no ftp passive

### Command Mode

Global Configuration

### Default

FTP works in Active mode.

### Usage

None

### Examples

The following example sets the ftp mode to passive:

```
Switch# configure terminal
Switch(config)# ftp passive
```

### Related Commands

ftp username

ftp password

## 2.3.4 show ftp

### Command Purpose

To display the ftp configurations, use show ftp command in Privileged EXEC mode.

### Command Syntax

show ftp

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

## Examples

The following example displays the ftp configurations:

```
Switch# show ftp
ftp passive mode: on
ftp username: root
ftp password: unencrypted,  abc
Switch#
```

## Related Commands

ftp username

ftp password

# 2.3.5 copy GFILENAME GURLNAME

## Command Purpose

Use this command to copy local file to ftp server.

## Command Syntax

copy *GFILENAME* ( vrf *VRF_NAME* | ) ( mgmt-if | -a *SRC_ADDR* | -si *SRC_INTF* ) *GURLNAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| mgmt-if | Management port | - |
| vrf WORD | VPN Routing/Forwarding instance | A string with 1-31 characters |
| GFILENAME | Copy from local file | The full path and file name , up to 255 characters |
| GURLNAME | Copy to local file | The full path and file name , up to 255 characters |
| -a SRC_ADDR | Copy with assigned IP | - |
| -si SRC_INTF | Copy with assigned Interface | - |

## Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This is a sample output from the command displaying how to copy local file to ftp server:

```
Switch# copy flash:/test.c ftp:/username:password@1.1.1.1:21/running-config
```

### Related Commands

None

## 2.3.6 copy GURLNAME GFILENAME

### Command Purpose

Use this command to copy file from ftp server to local.

### Command Syntax

copy ( vrf *VRF_NAME* | ) ( mgmt-if | -a *SRC_ADDR* | -si *SRC_INTF* ) *GURLNAME GFILENAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| mgmt-if | Management port | - |
| vrf WORD | VPN Routing/Forwarding instance | A string with 1-31 characters |
| GURLNAME | Copy from URL | The full path and file name , up to 255 characters |
| GFILENAME | Copy to local file | The full path and file name , up to 255 characters |
| -a SRC_ADDR | Copy with assigned IP | - |

| | | |
|---|---|---|
| -si SRC_INTF | Copy with assigned Interface | - |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This is a sample output from the command displaying how to copy file from ftp server to local:

```
Switch# copy ftp://username:password@1.1.1.1:21/test.c flash:test1.c
get file from ftp://username:password@1.1.1.1:21/test.c
.
Received 225 bytes in 0.3 seconds
```

### Related Commands

None

## 2.4 FTP server Commands

### 2.4.1 ftp server enable

### Command Purpose

To enable FTP server on switch.

### Command Syntax

ftp server ( mgmt-if | ) enable

no ftp server enable

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| mgmt-if | Management port | - |

### Command Mode

Global Configuration

### Default

None

### Usage

None

### Examples

The following example shows how to enable FTP server:

```
Switch# configure terminal
Switch# ftp server enable
```

### Related Commands

None

## 2.4.2 ftp server port

### Command Purpose

To config FTP server listen port.To restore the default value, use the no form of this command.

### Command Syntax

ftp server port *PORTNUM*

no ftp server port

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| port num | | (1025-65535) |

### Command Mode

Global Configuration

### Default

Default value is 21

### Usage

None

### Examples

The following example set FTP server port is 10000:

```
Switch# configure terminal
Switch# ftp server port 10000
```

### Related Commands

None

## 2.4.3 ftp server time-out

### Command Purpose

To config FTP server idle-time.To restore the default value, use the no form of this command.

### Command Syntax

ftp server time-out *MINUTES*

no ftp server time-out

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| minutes | | (1-1000)mins |

### Command Mode

Global Configuration

### Default

Default idle-time is 15mins

### Usage

None

### Examples

The following example set FTP server idle-time is 5mins:

```
Switch# configure terminal
Switch# ftp server time-out 5
```

### Related Commands

ftp passive

## 2.4.4 ftp server source address

### Command Purpose

To configure the source address of FTP server on your switch, use the FTP server source address command in Global Configuration. To restore the default value, use the no form of this command.

### Command Syntax

ftp server source address ( vrf *NAME* | ) *IP_ADDR*

no ftp server source address

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| vrf NAME | Specify a vrf to provide FTP server | A string with 1-31 characters |
| IP_ADDR | Configure IP address for ftp server working inband | IPv4 Address |

### Command Mode

Global Configuration

### Default

None

### Usage

You can use this command to modify the address which FTP server works on, and specify a vrf to provide FTP server. The source address can only be 0.0.0.0 or loopback interface's address, 0.0.0.0 indicates that the SSH server address is not specified.

### Examples

The following example shows how to specify FTP server source address:

```
Switch# configure terminal
Switch(config)# ftp server source address vrf vpn1 10.10.10.1
```

### Related Commands

None

## 2.4.5 show ftp server

### Command Purpose

To display the ftp server configurations, use show ftp server command in Privileged EXEC mode.

### Command Syntax

show ftp server

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following example displays the ftp server configurations:

```
Switch# show ftp server
FTP server configuration:
============================================================
 FTP Server                              : Disabled
 FTP Server Timeout                      : 15
 FTP Server Port                         : 21
 FTP Server Source Address               : 0.0.0.0
```

### Related Commands

None

## 2.5 TFTP Commands

### 2.5.1 copy GFILENAME GURLNAME

### Command Purpose

Use this command to copy local file to tftp server.

### Command Syntax

copy *GFILENAME* ( vrf *VRF_NAME* | ) ( mgmt-if | -a *SRC_ADDR* | -si *SRC_INTF* ) *GURLNAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| mgmt-if | Management port | - |
| vrf WORD | VPN Routing/Forwarding instance | A string with 1-31 characters |
| GFILENAME | Copy from local file | The full path and file name , up to 255 characters |
| GURLNAME | Copy to local file | The full path and file name , up to 255 characters |

| | | |
|---|---|---|
| -a SRC_ADDR | Copy with assigned IP | - |
| -si SRC_INTF | Copy with assigned Interface | - |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This is a sample output from the command displaying how to copy local file to tftp server:

```
Switch# copy flash:/test.c tftp://1.1.1.1/running-config
```

### Related Commands

None

## 2.5.2 copy GURLNAME GFILENAME

### Command Purpose

Use this command to copy file from tftp server to local.

### Command Syntax

copy ( vrf *VRF_NAME* | ) ( mgmt-if | -a *SRC_ADDR* | -si *SRC_INTF* ) *GURLNAME GFILENAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| mgmt-if | Management port | - |

| | | |
|---|---|---|
| vrf WORD | VPN Routing/Forwarding instance | A string with 1-31 characters |
| GURLNAME | Copy from URL | The full path and file name , up to 255 characters |
| GFILENAME | Copy to local file | The full path and file name , up to 255 characters |
| -a SRC_ADDR | Copy with assigned IP | - |
| -si SRC_INTF | Copy with assigned Interface | - |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This is a sample output from the command displaying how to copy file from tftp server to local:

```
Switch# copy tftp://1.1.1.1/test.c flash:test1.c
get file from tftp://1.1.1.1/test.c
.
Received 225 bytes in 0.3 seconds
```

### Related Commands

None

## 2.5.3 copy running-config mgmt-if

### Command Purpose

Use this command to copy running-config to tftp server.

## Command Syntax

copy running-config ( mgmt-if | ) *GURLNAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| startup-config | Copy from current system configuration | - |
| mgmt-if | Management port | - |
| GURLNAME | Copy to URL | The full path and file name , up to 255 characters |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This is a sample output from the command displaying how to copy running-config to tftp server:

```
Switch#copy running-config tftp://1.1.1.1/running-config
Building configuration…
send file to tftp://1.1.1.1/running-config
…
Sent 40198 bytes in 8.3 seconds
```

## Related Commands

None

## 2.5.4 copy mgmt-if startup-config

### Command Purpose

Use this command to copy startup-config from tftp server.

### Command Syntax

copy ( mgmt-if | ) *GURLNAME* startup-config

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| mgmt-if | Management port | - |
| GURLNAME | Copy from URL | The full path and file name , up to 255 characters |
| startup-config | Copy to startup system configuration | - |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This is a sample output from the command displaying how to copy startup-config from tftp server:

```
Switch#copy tftp://1.1.1.1/startup-config startup-config
get file from tftp://1.1.1.1/startup-config
..
Sent 32252 bytes in 6.4 seconds
```

### Related Commands

None

## 2.6 scp Commands

### 2.6.1 copy GFILENAME GURLNAME

### Command Purpose

Use this command to copy local file to scp server.

### Command Syntax

copy *GFILENAME* ( mgmt-if | ) *GURLNAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| mgmt-if | Management port | - |
| GFILENAME | Copy from local file | The full path and file name , up to 255 characters |
| GURLNAME | Copy to local file | The full path and file name , up to 255 characters |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This is a sample output from the command displaying how to copy local file to scp server:

```
Switch# copy flash:/test.c scp://1.1.1.1/running-config
```

### Related Commands

None

## 2.6.2 copy GURLNAME GFILENAME

### Command Purpose

Use this command to copy file from scp server to local.

### Command Syntax

copy ( mgmt-if | ) *GURLNAME GFILENAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| mgmt-if | Management port | - |
| GURLNAME | Copy from URL | The full path and file name , up to 255 characters |
| GFILENAME | Copy to local file | The full path and file name , up to 255 characters |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

## Examples

This is a sample output from the command displaying how to copy file from scp server to local:

```
Switch# copy scp://1.1.1.1/test.c flash:test1.c
get file from scp://1.1.1.1/test.c
.
Received 225 bytes in 0.3 seconds
```

## Related Commands

None

# 2.6.3 copy running-config mgmt-if

## Command Purpose

Use this command to copy running-config to scp server.

## Command Syntax

copy running-config ( mgmt-if | ) *GURLNAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| startup-config | Copy from current system configuration | - |
| mgmt-if | Management port | - |
| GURLNAME | Copy to URL | The full path and file name , up to 255 characters |

## Command Mode

Privileged EXEC

## Default

None

### Usage

None

### Examples

This is a sample output from the command displaying how to copy running-config to scp server:

```
Switch#copy running-config mgmt-if scp://1.1.1.1/running-config
Building configuration…
send file to scp://1.1.1.1/running-config
…
Sent 40198 bytes in 8.3 seconds
```

### Related Commands

None

## 2.6.4 copy mgmt-if startup-config

### Command Purpose

Use this command to copy startup-config from scp server.

### Command Syntax

copy ( mgmt-if | ) *GURLNAME* startup-config

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| mgmt-if | Management port | - |
| GURLNAME | Copy from URL | The full path and file name , up to 255 characters |
| startup-config | Copy to startup system configuration | - |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This is a sample output from the command displaying how to copy startup-config from scp server:

```
Switch#copy scp://1.1.1.1/startup-config startup-config
get file from scp://1.1.1.1/startup-config
..
Sent 32252 bytes in 6.4 seconds
```

### Related Commands

None

## 2.7 Telnet Commands

### 2.7.1 telnet

### Command Purpose

Use this command from the switch to access the other devices in the network.

### Command Syntax

telnet ( -a *SRC_ADDR* ) ( vrf *WORD* | mgmt-if ) *HOST* ( *PORT* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| -a SRC_ADDR | Telnet with assigned IP | - |
| vrf WORD | VPN Routing/Forwarding instance | A string with 1-31 characters |
| mgmt-if | Management port | - |
| HOST | IPv4, IPv6 address or name of the remote host | Support IPv4/IPv6 address or hostname |

| | | |
|---|---|---|
| PORT | TCP Port number | 1-65535 |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to Telnet from the switch to a remote host:

```
Switch# telnet mgmt-if 10.10.29.247
Entering character mode
Escape character is '^]'.
TestOS,  Version 2.3(62), fcs
Switch# telnet 2001:1000::1
Entering character mode
Escape character is '^]'.
DUT1#
```

### Related Commands

None

## 2.7.2 ip telnet server source address

### Command Purpose

To configure the source address of telnet server on your switch, use the telnet server source address command in Global Configuration. To restore the default value, use the no form of this command.

### Command Syntax

ip telnet server source address ( vrf *NAME* | ) *IP_ADDR*

no ip telnet server source address

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| vrf NAME | Specify a vrf to provide telnet server | A string with 1-31 characters |
| IP_ADDR | Configure IP address for telnet server working inband | IPv4 Address |

## Command Mode

Global Configuration

## Default

None

## Usage

You can use this command to modify the address which telnet server works on, and specify a vrf to provide telnet server. The source address can only be 0.0.0.0 or loopback interface's address, 0.0.0.0 indicates that the SSH server address is not specified.

## Examples

The following example shows how to specify telnet server source address:

```
Switch# configure terminal
Switch(config)# ip telnet server source address vrf vpn1 10.10.10.1
```

## Related Commands

None

# 2.7.3 ip telnet server source port

## Command Purpose

To configure the TCP port for telnet server working inband on your switch, use the telnet server source command in Global Configuration. To restore the default value, use the no form of this command.

## Command Syntax

ip telnet server source port *NUMBER*

no ip telnet server source port

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| port NUMBER | Configure TCP port for telnet server working inband | 1025-65535 |

## Command Mode

Global Configuration

## Default

None

## Usage

The CLI of "no telnet server source port" will configure TCP port for telnet server working inband with default value of 23.

## Examples

The following example shows how to set the TCP port for telnet server working inband on the switch :

```
Switch# configure terminal
Switch(config)# ip telnet server source port 2323
```

## Related Commands

None

## 2.7.4 ip telnet server source mgmt-if port

### Command Purpose

To configure the TCP port for telnet server working outband on your switch, use the telnet server source command in Global Configuration. To restore the default value, use the no form of this command.

### Command Syntax

ip telnet server source mgmt-if port *NUMBER*

no ip telnet server source mgmt-if port

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| mgmt-if port NUMBER | Configure TCP port for telnet server working outband | 1025-65535 |

### Command Mode

Global Configuration

### Default

None

### Usage

The CLI of "no telnet server sourc mgmt-if port" will configure TCP port for telnet server working outband with default value of 23.

### Examples

The following example shows how to set the TCP port for telnet server working outband on the switch :

```
Switch# configure terminal
Switch(config)# ip telnet server source mgmt-if port 2323
```

### Related Commands

None

## 2.8 SSH Commands

### 2.8.1 ip ssh server

### Command Purpose

To enable SSH service, use ip ssh server enable command in Global Configuration. To disable SSH service, use ip ssh server disable command.

### Command Syntax

ip ssh server ( enable | disable )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| enable | Turn on the SSH service | - |
| disable | Turn off the SSH service | - |

### Command Mode

Global Configuration

### Default

SSH service is enabled.

### Usage

None

### Examples

The following example enables the SSH service on your switch:

```
Switch# configure terminal
Switch(config)# ip ssh server enable
```

### Related Commands

show ip ssh server status

## 2.8.2 ip ssh server authentication-retries

### Command Purpose

To configure Secure Shell (SSH) authentication retry times on your switch, use the ip ssh server authentication-retries command in Global Configuration. To restore the default value, use the no form of this command.

### Command Syntax

ip ssh server authentication-retries *COUNT*

no ip ssh server authentication-retries

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| COUNT | The number of retries, with a maximum of 6 authentication retries | 1-6 |

### Command Mode

Global Configuration

### Default

The default is 6.

### Usage

None

### Examples

The following examples configure SSH authentication retry times on your switch:

```
Switch# configure terminal
Switch(config)# ip ssh server authentication-retries 3
```

### Related Commands

show ip ssh server status

## 2.8.3 ip ssh server authentication-timeout

### Command Purpose

To configure Secure Shell (SSH) authentication timeout on your switch, use the ip ssh server authentication-timeout command in Global Configuration. To restore the default value, use the no form of this command.

### Command Syntax

ip ssh server authentication-timeout *SECONDS*

no ip ssh server authentication-timeout

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SECONDS | The number of seconds until timeout disconnects | 1-120 seconds |

### Command Mode

Global Configuration

### Default

The default is 120 seconds.

### Usage

None

### Examples

The following examples configure SSH authentication timeout on your switch:

```
Switch# configure terminal
Switch(config)# ip ssh server authentication-timeout 100
```

### Related Commands

show ip ssh server status

## 2.8.4 ip ssh server authentication-type

### Command Purpose

To configure Secure Shell (SSH) authentication type on your switch, use the ip ssh server authentication-type command in Global Configuration. To restore the default value, use the no form of this command.

### Command Syntax

ip ssh server authentication-type ( all | { password | public-key | rsa } )

no ip ssh server authentication-type

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| all | Enable all authentication type | - |
| password | Enable password authentication | - |
| public-key | Enable SSHv2 public key authentication | - |
| rsa | Enable SSHv1 rsa authentication | - |

### Command Mode

Global Configuration

### Default

The default authentication type is all.

### Usage

None

### Examples

The following examples configure SSH authentication type on the switch:

```
Switch# configure terminal
Switch(config)# ip ssh server authentication-type password
```

### Related Commands

show ip ssh server status

## 2.8.5 ip ssh server host-key rsa key

### Command Purpose

To configure Secure Shell (SSH) host-key on your switch, use the ip ssh server host-key rsa key command in Global Configuration. To restore the default value, use the no form of this command.

### Command Syntax

ip ssh server host-key rsa key *KEYNAME*

no ip ssh server host-key rsa

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| KEYNAME | The key value for host key | Up to 32 characters |

### Command Mode

Global Configuration

### Default

None

### Usage

Host-key is used to combining public key to generate a session. When SSH login,modifing host-key can cause connection closed.

### Examples

The following examples configure SSH host key on your switch:

```
Switch# configure terminal
Switch(config)# ip ssh server host-key rsa key KEY1
```

### Related Commands

show ip ssh server status

## 2.8.6 ip ssh server rekey-interval

### Command Purpose

To configure Secure Shell (SSH) rekey interval on your switch, use the ip ssh server rekey-interval command in Global Configuration. To restore the default value, use the no form of this command.

### Command Syntax

ip ssh server rekey-interval *MINUTE*

no ip ssh server rekey-interval

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MINUTE | The rekey interval in minutes | 1-1440 minutes |

### Command Mode

Global Configuration

### Default

The default interval is 60 minutes.

### Usage

None

### Examples

The following examples configure SSH rekey interval on your switch:

```
Switch# configure terminal
Switch(config)# ip ssh server rekey-interval 30
```

### Related Commands

show ip ssh server status

## 2.8.7 ip ssh server version

### Command Purpose

To configure Secure Shell (SSH) version on your switch, use the ip ssh server version command in Global Configuration. To restore the default value, use the no form of this command.

### Command Syntax

ip ssh server version ( 1 | 2 | all )

no ip ssh server version

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| 1 | Switch runs only SSH Version 1 | - |
| 2 | Switch runs only SSH Version 2 | - |
| all | Version 1 and Version 2 are both supported | - |

### Command Mode

Global Configuration

### Default

The default SSH version is 2.

### Usage

You can use this command with the 2 keyword to ensure that your switch will not inadvertently establish a weaker SSH Version 1 connection.

### Examples

The following example shows that only SSH Version 1 support is configured:

```
Switch# configure terminal
Switch(config)# ip ssh server version 1
```

### Related Commands

show ip ssh server status

## 2.8.8 ip ssh server source address

### Command Purpose

To configure the source address of Secure Shell (SSH) server on your switch, use the ip ssh server source command in Global Configuration. To restore the default value, use the no form of this command.

### Command Syntax

ip ssh server source address { vrf *NAME* | } *IP_ADDR*

no ip ssh server source address

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| vrf NAME | Specify a vrf to provide SSH server | Up to 31 characters |
| IP_ADDR | Configure IP address for SSH server working inband | IPv4 Address |

### Command Mode

Global Configuration

## Default

None

## Usage

You can use this command to modify the address which SSH server works on, and specify a vrf to provide SSH server. The source address can only be 0.0.0.0 or loopback interface's address, 0.0.0.0 indicates that the SSH server address is not specified.

## Examples

The following example shows how to set SSH server inbind address :

```
Switch# configure terminal
Switch(config)# ip ssh server source address 10.10.10.1
```

## Related Commands

ip ssh server

# 2.8.9 ip ssh server source port

## Command Purpose

To configure the TCP port for SSH server working inband on your switch, use the ip ssh server source command in Global Configuration. To restore the default value, use the no form of this command.

## Command Syntax

ip ssh server source port *NUMBER*

no ip ssh server source port

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| port NUMBER | Configure TCP port for SSH server working inband | 1025-65535 |

### Command Mode

Global Configuration

### Default

None

### Usage

The CLI of "no ip ssh server source port" will configure TCP port for SSH server working inband with default value of 22.

### Examples

The following example shows the special port is configured:

```
Switch# configure terminal
Switch(config)# ip ssh server source port 2222
```

### Related Commands

ip ssh server

## 2.8.10 ip ssh server source mgmt-if port

### Command Purpose

To configure the TCP port for SSH server working outband on your switch, use the ip ssh server source command in Global Configuration. To restore the default value, use the no form of this command.

### Command Syntax

ip ssh server source mgmt-if port *NUMBER*

no ip ssh server source mgmt-if port

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| mgmt-if port NUMBER | Configure TCP port for SSH server working outband | 1025-65535 |

### Command Mode

Global Configuration

### Default

None

### Usage

The CLI of "no ip ssh server source mgmt-if port" will configure TCP port for SSH server working outband with default value of 22.

### Examples

The following example shows the special port is configured:

```
Switch# configure terminal
Switch(config)# ip ssh server source mgmt-if port 2222
```

### Related Commands

ip ssh server

## 2.8.11 show ip ssh server status

### Command Purpose

To display the version and configuration data for Secure Shell (SSH), use the show ip ssh server status command in Privileged EXEC mode.

### Command Syntax

show ip ssh server status

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following example shows the current SSH configurations:

```
Switch# show ip ssh server status
 SSH server enabled
 Version: 1.99
 Authentication timeout: 33 second(s)
 Authentication retries: 6 time(s)
 Server key lifetime: 60 minute(s)
 Authentication type: password,  public-key
```

### Related Commands

show ip ssh server session

## 2.8.12 rsa key generate

### Command Purpose

To create a key by system, use the rsa key generate command in Global Configuration.

### Command Syntax

rsa key *KEYNAME* generate

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| KEYNAME | The name of the key | Up to 32 characters |

### Command Mode

Global Configuration

### Default

None

### Usage

Use the rsa key command to create a key by system.

### Examples

The following example creates a key named KEY1:

```
Switch# configure terminal
Switch(config)# rsa key KEY1 generate
Generating RSA private key, 1024 bit long modulus
Please waiting for a moment: done!
Public exponent is 65537 (0x10001)
Generate RSA key successfully
Switch(config)#
```

### Related Commands

show rsa keys

## 2.8.13 rsa key

### Command Purpose

To create a key, use the rsa key command in Global Configuration.

### Command Syntax

rsa key *KEYNAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| KEYNAME | The name of the key | Up to 32 characters |

### Command Mode

Global Configuration

### Default

None

### Usage

Use the rsa key command to create a key.

### Examples

The following example creates a key named KEY1:

```
Switch# configure terminal
Switch(config)# rsa key KEY1
Switch(config-rsa-key)#
```

### Related Commands

show rsa keys

## 2.8.14 key format

### Command Purpose

To specify the key format, use the key format command in RSA key configuration mode.

### Command Syntax

key format ( der | pem )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| der | The format is der | - |
| pem | The format is pem | - |

### Command Mode

Rsa Key Configuration

### Default

The default key format is DER.

### Usage

None

### Examples

The following example specify the key format of KEY1 as der :

```
Switch# configure terminal
Switch(config)# rsa key KEY1
Switch(config-rsa-key)# key format der
```

### Related Commands

rsa key

## 2.8.15 key string end

### Command Purpose

To exit the rsa key configuration mode to Global Configuration and apply all rsa key configurations, use the key string end command in RSA key configuration mode.

### Command Syntax

key string end

### Command Mode

Rsa Key Configuration

### Default

None

### Usage

None

### Examples

The following example shows exit the rsa key configuration mode :

```
Switch# configure terminal
Switch(config)# rsa key KEY1
Switch(config-rsa-key)# key string end
Switch(config)#
```

### Related Commands

rsa key

## 2.8.16 key type

### Command Purpose

To specify the key type, use the key type command in RSA key configuration mode.

### Command Syntax

key type ( public | private )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| public | Specify the key as a public key | - |
| private | Specify the key as a private key | - |

### Command Mode

Rsa Key Configuration

### Default

None

### Usage

None

### Examples

The following example specifies the key type of KEY1 as public key:

```
Switch# configure terminal
Switch(config)# rsa key KEY1
Switch(config-rsa-key)# key type public
```

### Related Commands

rsa key

## 2.8.17 reset

### Command Purpose

To clear all key configurations, use the reset command in RSA key configuration mode.

### Command Syntax

reset

### Command Mode

Rsa Key Configuration

### Default

None

### Usage

None

### Examples

The following example shows to clear all configurations for the key KEY1:

```
Switch# configure terminal
Switch(config)# rsa key KEY1
Switch(config-rsa-key)# reset
```

### Related Commands

rsa key

## 2.8.18 validate

### Command Purpose

To check the validation of the key strings, use the validate command in RSA key configuration mode.

### Command Syntax

validate

### Command Mode

Rsa Key Configuration

### Default

None

### Usage

None

### Examples

The following example shows to validate key strings of the key KEY1:

```
Switch# configure terminal
Switch(config)# rsa key KEY1
Switch(config-rsa-key)# validate
```

### Related Commands

rsa key

## 2.8.19 KEYLINE

### Command Purpose

To add key strings from the screen directly, type any strings in RSA key configuration mode except the keywords in this mode.

### Command Syntax

*KEYLINE*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| KEYLINE | key line | key line string |

### Command Mode

Rsa Key Configuration

### Default

None

### Usage

Type any key string.

### Examples

The following example shows to type a key string of the key KEY1:

```
Switch# configure terminal
Switch(config)# rsa key KEY1
Switch(config-rsa-key)# 00302017 4A7D385B 1234EF29 335FC973
Switch(config-rsa-key)# 2DD50A37 C4F4B0FD 9DADE748 429618D5
```

### Related Commands

validate

# 2.8.20 rsa key export

## Command Purpose

To export the key file to a specified destination, use the rsa key export command in Global Configuration.

## Command Syntax

rsa key *KEYNAME* export url *DEST_FILE* ( public | private ) ( der | der-hex | pem | ssh1 | ssh2 )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| KEYNAME | Specify the key name to display | Up to 32 characters |
| DEST_FILE | The destination file path and name | The full path and file name , up to 255 characters |
| public | Specify the key as a public key | - |
| private | Specify the key as a private key | - |
| der | DER format | - |
| der-hex | DER HEX format | - |
| pem | PEM format | - |
| ssh1 | SSHv1 format | - |
| ssh2 | Specify the key format | - |

## Command Mode

Global Configuration

## Default

None

## Usage

Use the rsa key generate command to generate a key.

## Examples

The following example shows to export the key KEY1 to flash as a public key:

```
Switch# configure terminal
Switch(config)# rsa key KEY1 export url flash:/key1.pub public ssh2
```

The following example shows to export the key KEY2 to flash as a private key:

```
Switch# configure terminal
Switch(config)# rsa key KEY2 export url flash:/key1 private ssh1
```

## Related Commands

rsa key generate

rsa key import

# 2.8.21 rsa key import

## Command Purpose

To import the key file from a specified source, use the rsa key import command in Global Configuration.

## Command Syntax

rsa key *KEYNAME* import url *SRC_FILE* ( public | private ) ( der | der-hex | pem | ssh1 | ssh2 )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| KEYNAME | Specify the key name to display | Up to 32 characters |
| SRC_FILE | The destination file path and name | The full path and file name , up to 255 characters |
| public | Specify the key as a public key | - |
| private | Specify the key as a private key | - |
| der | DER format | - |
| der-hex | DER HEX format | - |
| pem | PEM format | - |
| ssh1 | SSHv1 format | - |

| | | |
|---|---|---|
| ssh2 | Specify the key format | - |

## Command Mode

Global Configuration

## Default

None

## Usage

Use the rsa key to generate command to generate a key.

## Examples

The following example shows to import the key KEY1 to flash as a public key:

```
Switch# configure terminal
Switch(config)# rsa key KEY1 import url flash:/key1.pub public ssh2
```

The following example shows to import the key KEY2 to flash as a private key:

```
Switch# configure terminal
Switch(config)# rsa key KEY2 import url flash:/key1 private ssh1
```

## Related Commands

rsa key generate

rsa key export

# 2.8.22 rsa key import

## Command Purpose

To import the key file from a specified source, use the rsa key import command in Global Configuration.

## Command Syntax

rsa key *KEYNAME* import url *SRC_FILE* ( public | private ) ( der | der-hex | pem | ssh1 | ssh2 )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| KEYNAME | Specify the key name to display | Up to 32 characters |
| SRC_FILE | The destination file path and name | The full path and file name , up to 255 characters |
| public | Specify the key as a public key | - |
| private | Specify the key as a private key | - |
| der | DER format | - |
| der-hex | DER HEX format | - |
| pem | PEM format | - |
| ssh1 | SSHv1 format | - |
| ssh2 | Specify the key format | - |

## Command Mode

Global Configuration

## Default

None

## Usage

Use the rsa key to generate command to generate a key.

## Examples

The following example shows to import the key KEY1 to flash as a public key:

```
Switch# configure terminal
Switch(config)# rsa key KEY1 import url flash:/key1.pub public ssh2
```

The following example shows to import the key KEY2 to flash as a private key:

```
Switch# configure terminal
Switch(config)# rsa key KEY2 import url flash:/key1 private ssh1
```

## Related Commands

rsa key generate

rsa key export

## 2.8.23 ip ssh server algorithm encryption

### Command Purpose

The command is used to specify the encryption algorithms that can be used by the SSH server

### Command Syntax

ip ssh server algorithm encryption [all | 3des-cbc | aes128-cbc | aes128-ctr | aes192-cbc | aes192-ctr | aes256-cbc | aes256-ctr | blowfish-cbc | cast128-cbc | chacha20-poly1305]

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| 3des-cbc | 3des-cbc encryption algorithm | - |
| aes128-cbc | Aes128-cbc encryption algorithm | - |
| aes128-ctr | Aes128-ctr encryption algorithm | |
| aes192-cbc | Aes192-cbc encryption algorithm | - |
| aes192-ctr | Aes192-ctr encryption algorithm | - |
| aes256-cbc | Aes256-cbc encryption algorithm | - |
| aes256-ctr | Aes256-ctr encryption algorithm | - |
| all | All encryption algorithms t | - |
| blowfish-cbc | Blowfish-cbc encryption algorithm | - |
| cast128-cbc | Cast128-cbc encryption algorithm | - |
| chacha20-poly1305 | Chacha20-poly1305 encryption algorithm | - |

### Command Mode

Global Configuration

### Default

all

### Usage

The command is used to specify the encryption algorithms that can be used by the SSH server

### Examples

The following example specifies that the SSH server uses aes128-cbc as the encapsulated encryption algorithm.

```
Switch# configure terminal
Switch(config)# ip ssh server algorithm encryption aes128-cbc
```

### Related Commands

ip ssh server algorithm key-exchange

ip ssh server algorithm mac

## 2.8.24 ip ssh server algorithm key-exchange

### Command Purpose

The command is used to specify the Key exchange encryption algorithms that can be used by the SSH server

### Command Syntax

ip ssh server algorithm key-exchange [ all | curve25519-sha256 | dh-group-exchange-sha1 |dh-group-exchange-sha256 |dh-group1-sha1 | ecdh-sha2-nistp256 | ecdh-sha2-nistp384 | ecdh-sha2-nistp521 ]

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| all | All key exchagne algorithms | - |
| aes128-cbc | Aes128-cbc encryption algorithm | - |

| | | |
|---|---|---|
| curve25519-sha256 | Curve25519-sha256 key exchagne algorithm | - |
| dh-group-exchange-sha1 | Diffie-hellman-group-exchange-sha1 key exchagne algorithm | - |
| dh-group-exchange-sha256 | Diffie-hellman-group-exchange-sha256 key exchagne algorithm | - |
| dh-group1-sha1 | Diffie-hellman-group1-sha1 key exchagne algorithm | - |
| dh-group14-sha1 | Diffie-hellman-group14-sha1 key exchagne algorithm | - |
| ecdh-sha2-nistp256 | Ecdh-sha2-nistp256 key exchagne algorithm | - |
| ecdh-sha2-nistp384 | Ecdh-sha2-nistp384 key exchagne algorithm | - |
| ecdh-sha2-nistp521 | Ecdh-sha2-nistp521 key exchagne algorithm | - |

## Command Mode

Global Configuration

## Default

None

## Usage

The command is used to specify the Key-exchange algorithms that can be used by the SSH server

## Examples

The following example specifies that the SSH server uses aes128-cbc as the key-exchange encryption algorithm.

```
Switch# configure terminal
Switch(config)# ip ssh server algorithm key-exchange aes128-cbc
```

## Related Commands

ip ssh server algorithm encryption

ip ssh server algorithm mac

# 2.8.25 ip ssh server algorithm mac

## Command Purpose

The command is used to specify the mac encryption algorithms that can be used by the SSH server

## Command Syntax

ip ssh server algorithm mac [ all | hmac-md5 | hmac-md5-96 | hmac-md5-96-etm | hmac-md5-etm | hmac-ripemd160 | hmac-ripemd160-etm | hmac-sha1 | hmac-sha1-96 | hmac-sha1-96-etm | hmac-sha1-etm | hmac-sha2-256 | hmac-sha2-256-etm | hmac-sha2-512 | hmac-sha2-512-etm | umac-128 | umac-128-etm | umac-64 | umac-64-etm]

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| all | All MAC algorithms | - |
| hmac-md5 | Hmac-md5 algorithm | - |
| hmac-md5-96 | Hmac-md5-96 algorithm | - |
| hmac-md5-96-etm | Hmac-md5-96-etm algorithm | - |
| hmac-md5-etm | Hmac-md5-etm algorithm | - |
| hmac-ripemd160 | Hmac-ripemd160 algorithm | - |
| hmac-ripemd160-etm | Hmac-ripemd160-etm algorithm | - |
| hmac-sha1 | Hmac-sha1 algorithm | - |
| hmac-sha1-96 | Hmac-sha1-96 algorithm | - |
| hmac-sha1-96-etm | Hmac-sha1-96-etm algorithm | - |
| hmac-sha1-etm | Hmac-sha1-etm algorithm | - |
| hmac-sha2-256 | Hmac-sha2-256 algorithm | - |
| hmac-sha2-256-etm | Hmac-sha2-256-etm algorithm | - |
| hmac-sha2-512 | Hmac-sha2-512 algorithm | - |

| | | |
|---|---|---|
| hmac-sha2-512-etm | Hmac-sha2-512-etm algorithm | - |
| umac-128 | Umac-128 algorithm | - |
| umac-128-etm | Umac-128-etm algorithm | - |
| umac-64 | Umac-64 algorithm | - |
| umac-64-etm | Umac-64-etm algorithm | - |

### Command Mode

Global Configuration

### Default

None

### Usage

The command is used to specify the mac encryption algorithms that can be used by the SSH server

### Examples

The following example specifies that the SSH server uses aes128-cbc as the mac encryption algorithm.

```
Switch# configure terminal
Switch(config)# ip ssh server algorithm mac hmac-sha2-256-etm
```

### Related Commands

ip ssh server algorithm encryption

ip ssh server algorithm key-exchange

## 2.8.26 ip ssh server secure-certificate load

### Command Purpose

The command is used to load or cancel the specified CA certificate. Use the 'no' form to restore to default configuration.

### Command Syntax

ip ssh server secure-certificate load *FILENAME*

no ip ssh server secure-certificate load

### Command Mode

Privileged mode

### Default

None

### Usage

This command is used to display the ciphersuite currently used by SSL, the TSLv3.0 ciphersuite will always be open.

### Examples

The following example shows how to load a certificate with the file name 'enhance.pub' in the flash:/directory.

```
Switch# ip ssh server secure-certificate load flash:/enhance.pub
```

### Related Commands

none

## 2.8.27 ip ssh client algorithm host-key

### Command Purpose

When the switch acts as an SSH client, use this command to specify the host key algorithm that can be used when negotiating encryption algorithms between the switch and the server.

## Command Syntax

ip ssh client algorithm host-key [all | ecdsa-sha2-nistp256 | ssh-ed25519 | ssh-rsa]

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| all | All supported host key algorithms | |
| ecdsa-sha2-nistp256 | Using the ecdsa-sha2-nistp256 algorithm | |
| ssh-ed25519 | Using the ssh-ed25519 algorithm | |
| ssh-rsa | Using the ssh-rsa algorithm | |

## Command Mode

Global Configuration

## Default

None

## Usage

Use this command to specify the host key algorithms that can be used as SSH clients for the switch

## Example

When specifying a switch as an SSH client, the ssh ed25519 algorithm can be used:

```
Switch(config)# ip ssh client algorithm host-key ssh-ed25519
```

## Related Commands

None

# 2.8.28 ip ssh server algorithm host-key

## Command Purpose

When the switch acts as an SSH server, use this command to specify the type of host key algorithm that can be used when negotiating encryption algorithms with the client.

## Command Syntax

ip ssh server algorithm host-key [all | ecdsa-sha2-nistp256 | ssh-ed25519 | ssh-rsa]

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| all | All supported host key algorithms | |
| ecdsa-sha2-nistp256 | Using the ecdsa-sha2-nistp256 algorithm | |
| ssh-ed25519 | Using the ssh-ed25519 algorithm | |
| ssh-rsa | Using the ssh-rsa algorithm | |

## Command Mode

Global Configuration

## Default

None

## Usage

When the switch acts as an SSH server, use this command to specify the type of host key algorithm that can be used when negotiating encryption algorithms with the client.

## Example

When is the switch as an SSH server, the ssh ed25519 algorithm can be used:

```
Switch(config)# ip ssh server algorithm host-key ssh-ed25519
```

### Related Commands

ip ssh server enable

## 2.8.29 show rsa key

### Command Purpose

To display the details of the keys, use the show rsa key command in Privileged EXEC mode.

### Command Syntax

show rsa key *KEYNAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| KEYNAME | Specify the key name to display | Up to 32 characters |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following example displays the detailed information of the key named “KEY1”:

```
Switch# show rsa key KEY1
RSA key information:
============================================================
Name: KEY1
Type: private
Modulus: 1024 bit
```

```
Usage count: 0
Private key DER code:
30820258
    0201
      00
    028180
      9B3E9726 6405BD54 692F172A901F3879 C947366E 5703D282 AA31707F 214D38C9
```

### Related Commands

show rsa keys

## 2.8.30 show rsa keys

### Command Purpose

To display the brief information of all the keys, use the show rsa keys command in Privileged EXEC mode.

### Command Syntax

show rsa keys

### Command Mode

Privileged EXEC

### Default

None

### Usage

Use the rsa key generate command to generate a key.

### Examples

The following example displays the brief information of the keys:

```
Switch# show rsa keys
Name                              Type     Usage   Modulus
=============================================================
```

```
key1                            private  0       1024
key2                            public   0       1024
```

### Related Commands

show rsa key

# 2.9 Time&Timezone Commands

## 2.9.1 clock set datetime

### Command Purpose

Use this command to set system current date and time on the Switch.

### Command Syntax

clock set datetime *HH:MM:SS MONTH DAY YEAR*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| HH:MM:SS | Specify the time in hours (24-hour format), minutes, and seconds. The time specified is relative to the configured time zone | HH:MM:SS in 24-hour format. |
| MONTH | Specify the month by name | Should be in range 1 to 12 |
| DAY | Specify the day by date in the month | Should be in range 1 to 31 |
| YEAR | Specify the year | Should be in range 1993 to 2035 |

### Command Mode

Global Configuration

### Default

The default time is based from UTC.

### Usage

If no other source of time is available, you can manually configure the time and date after the system is restarted. The time remains accurate until the next system restart. We recommend that you use manual configuration only as a last resort. If you have an outside source to which the switch can synchronize, you do not need to manually set the system clock.

### Examples

This example shows how to manually set the system clock to 1：32 p.m. on July 23, 2014:

```
Switch# configure terminal
Switch(config)# clock set 13:32:00 23 7 2014
```

### Related Commands

show clock

## 2.9.2 clock set timezone

### Command Purpose

Use this command to set the time zone on the Switch.

To restore to the default time of UTC, use the no form of this command.

### Command Syntax

clock set timezone *ZONE* ( add | minus ) hours-offset [ minutes-offset ] [ seconds-offset ]

no clock set timezone

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ZONE | Specify the zone name | the length should be [3, 32), and only [a-zA-Z_] is supported, and the first and last character must be alphabet. |

| | | |
|---|---|---|
| add | Specify the time offset is positive from UTC | - |
| minus | Specify the time offset is negative from UTC | - |
| HOUR_OFFSET | Specify the time offset in hours | 0-18 |
| MINUTES_OFFSET | [optional]Specify the time offset in minutes, should be in range 0 to 59 | 0-59 |
| SECCONDS_OFFSET | [optional]Specify the time offset in seconds | 0-59 |

## Command Mode

Global Configuration

## Default

The default time zone should be UTC.

## Usage

None

## Examples

The following example sets the Atlantic Canada time zone is 3.5 hours less than UTC:

```
Switch# configure terminal
Switch(config)# clock set timezone Canada minus 3 30
```

The following example sets the time zone named ZZZ is 5 hours faster than UTC:

```
Switch# configure terminal
Switch(config)# clock set timezone ZZZ add 5
```

## Related Commands

show clock (detail)

## 2.9.3 clock set summer-time

### Command Purpose

Use this command to set summer time (daylight saving time) in areas where it starts and ends on a particular day each year(recurring) or on specified year(date).

To restore to the default time of UTC, use the no form of this command.

### Command Syntax

clock set summer-time *ZONE* recurring start-time end-time offset

clock set summer-time *ZONE* date start-time end-time offset

no clock set summer-time

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ZONE | Specify the summer zone name | The length should be [3, 32), and only [a-zA-Z_] is supported, and the first and last character must be alphabet. |
| recurring | Specify that summer time starts and ends on a particular day of the week each year | - |
| date | Specify that summer time starts and ends on a particular day of the specified year | - |
| START_TIME | Specify the start time of summer time | For recurring summer time, the format should be month, day, hh:mm:ss or (first \| second \| third \| fourth \| last) DAY <1-12> HH:MM:SS, while for date summer time, the format should be month, day, year, hh:mm:ss |

| | | |
|---|---|---|
| END_TIME | Specify the end time of summer time | For recurring summer time, the format should be month, day, hh:mm:ss or (first \| second \| third \| fourth \| last) DAY <1-12> HH:MM:SS, while for date summer time, the format should be month, day, year, hh:mm:ss |
| OFFSET | For offset, specify the number of minutes to add during summer time. The default is 60. | 1-120 minutes |

## Command Mode

Global Configuration

## Default

Summer time should be disabled by default.

## Usage

The first part of the clock summer-time global configuration command specifies when summer time begins, and the second part specifies when it ends. All times are relative to the local time zone. The start time is relative to standard time. The end time is relative to summer time. If the starting month is after the ending month, the system assumes that you are in the southern hemisphere.

## Examples

This example shows how to specify that summer time starts on june 1st at 0200 and ends on the October 31 at 0200:

```
Switch# configure terminal
Switch(config)# clock set summer-time stime recurring 6 1 02:00:00 10 31 02:00:00
120
```

This example shows how to specify that summer time starts on March the second Wednesday at 0200 and ends on the August the last Friday at 0100:

```
Switch# configure terminal
Switch(config)# clock set summer-time stime recurring second Wed 3 02:0:0 last Fri
8 01:0:0 60
```

### Related Commands

show clock (detail)

## 2.9.4 show clock

### Command Purpose

Use this command to display the current time and date configuration.

### Command Syntax

show clock ( detail | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| detail | Display the configured timezone and summer time information in addition to current date and time | - |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example displays current time and date in detail:

```
Switch#show clock detail
10:43:00 beijing Fri Oct 25 2013
Time zone: (GMT + 08:00:00)  beijing
```

### Related Commands

show clock

## 2.9.5 show timezones

### Command Purpose

Use this command to display all the timezones in world.

### Command Syntax

show timezons

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example displays all the current timezones:

```
Switch#show timezones
(GMT+00:06:04)    Europe/Andorra
(GMT+03:41:12)    Asia/Dubai
(GMT+04:36:48)    Asia/Kabul
(GMT-04:07:12)    America/Antigua
(GMT-04:12:16)    America/Anguilla
(GMT+01:19:20)    Europe/Tirane
(GMT+02:58:00)    Asia/Yerevan
(GMT-04:36:00)    America/Curacao
(GMT+00:52:56)    Africa/Luanda
(GMT+11:06:24)    Antarctica/McMurdo    McMurdo Station, Ross Island
============================================================
(GMT+00:00:00)    Antarctica/South_Pole Amundsen-Scott Station, South Pole
```

```
(GMT-04:32:32)    Antarctica/Rothera    Rothera Station, Adelaide Island
(GMT-04:16:24)    Antarctica/Palmer     Palmer Station, Anvers Island
```

### Related Commands

show clock

## 2.10 License Commands

### 2.10.1 generate device identifier

#### Command Purpose

To generate device identifier, use this command in Privileged EXEC mode.

#### Command Syntax

generate device identifier ( mgmt-if | ) *GURLNAME*

generate device identifier ( *GFILENAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| mgmt-if | Management port | - |
| GURLNAME | URL name | - |
| GFILENAME | local file name | - |

#### Command Mode

Privileged EXEC

#### Default

None

#### Usage

This command will generate the unique device identifier (UDI) on the current device, customer can get license for the current device form the vendor with UDI.

### Examples

The following example shows how to generate UDI:

```
Switch# generate device identifier mgmt-if tftp://10.10.38.160/device.udi
```

### Related Commands

None

## 2.10.2 show license

### Command Purpose

To show license on the device, use the show license command in Privileged EXEC mode.

### Command Syntax

show license ( *GFILENAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| GFILENAME | local file name | - |

### Command Mode

Privileged EXEC

### Default

None

### Usage

This command will show the license on the current device.

### Examples

The following example shows how to show license:

```
Switch# show lincese
License files:
```

```
=========================================================================
flash:/ma.lic:
  Created Time: Fri Dec  6 17:22:23 CST 2013
  Vendor:       Vendor1
  Customer:     Customer1
  Device MAC:   00:1E:08:09:03:00
  Feature Set:  QINQ MVR ERPS MEF ETHOAM
                VPWS VPLS HVPLS SMLK TPOAM
                OSPF PIM_SM IGMP VRF MPLS
                LDP BGP RSVP OSPF_TE EXTEND_ACL
                PTP BFD SSM IPV6 OSPF6
                PIM_SM6 MVR6 RIPNG TUNNEL_V6
```

### Related Commands

None

## 2.11 HTTP commands Commands

### 2.11.1 service http

#### Command Purpose

To enable HTTP service, use service http enable command in Global Configuration.

To disable HTTP service, use service http disable command.

#### Command Syntax

service http ( enable | disable )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| enable | Turn on the HTTP service | - |
| disable | Turn off the HTTP service | - |

#### Command Mode

Global Configuration

#### Default

HTTP service is disabled.

### Usage

The WEB image should be loaded first.

### Examples

The following example shows how to enable HTTP service:

```
Switch# configure terminal
Switch(config)# service http enable
```

### Related Commands

http server load

http timeout

## 2.11.2 service https

### Command Purpose

To enable HTTPS service, use service http enable command in Global Configuration.
To disable HTTPS service, use service http disable command.

### Command Syntax

service https ( enable | disable )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| enable | Turn on the HTTPS service | - |
| disable | Turn off the HTTPS service | - |

### Command Mode

Global Configuration

### Default

HTTPS service is disabled.

### Usage

The WEB image should be loaded first.

### Examples

The following example shows how to enable HTTPS service:

```
Switch# configure terminal
Switch(config)# service https enable
```

### Related Commands

http server load

http timeout

## 2.11.3 http server load

### Command Purpose

To load WEB image, user the http server load command .

### Command Syntax

http server load *FILENAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| FILENAME | Name of WEB image | - |

### Command Mode

Global Configuration

### Default

None

### Usage

None

### Examples

The following example shows how to specify web image:

```
Switch# configure terminal
Switch(config)# http server load flash:/webImage.bin
```

### Related Commands

service http enable

service https enable

http timeout

## 2.11.4 http server secure-certificate load

### Command Purpose

To load ssl certificate, use the command .

### Command Syntax

http server secure-certificate load *GFILENAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| GFILENAME | Path of ssl certificate | - |

### Command Mode

Global Configuration

### Default

HTTPS load system default certificate

### Usage

None

### Examples

The following example shows how to specify ssl certificate

```
Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# http server secure-certificate load flash:/server.pem
```

### Related Commands

service https enable

## 2.11.5 http timeout

### Command Purpose

To configure the expire time of online web users.

### Command Syntax

http timeout *TIMEOUT*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| TIMEOUT | Online web user expire time. | The range is [1,60], unit is minute. |

### Command Mode

Global Configuration

### Default

20min.

### Usage

None

### Examples

The following example shows how to configure http timeout:

```
Switch# configure terminal
Switch(config)# http timeout 30
```

### Related Commands

http server load

service http enable

service https enable

## 2.11.6 http server source address

### Command Purpose

To configure the source address of WEB server on your switch, use the http server source address command in Global Configuration. To restore the default value, use the no form of this command.

### Command Syntax

http server source address ( vrf *NAME* | ) *A.B.C.D*

no http server source address

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| vrf NAME | Specify a vrf to provide WEB server | A string with 1-31 characters |
| A.B.C.D | Configure IP address for WEB server working | - |

### Command Mode

Global Configuration

### Default

None

## Usage

You can use this command to modify the address which WEB server works on, and specify a vrf to provide WEB server. The source address can only be 0.0.0.0 or loopback interface's address, 0.0.0.0 indicates that the WEB server address is not specified.

## Examples

The following example shows how to set inband http server address:

```
Switch# configure terminal
Switch(config)# http server source address  10.10.10.1
```

## Related Commands

http server load

service http enable

service https enable

# 2.11.7 http server source port

## Command Purpose

To configure the TCP port for HTTP server working inband on your switch, use the http server source port command in Global Configuration. To restore the default value, use the no form of this command.

## Command Syntax

http server source port *PORT*

no http server source port

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PORT | Configure TCP port for HTTP server working inband | 1025-65535 |

### Command Mode

Global Configuration

### Default

80

### Usage

The CLI of "no http server source port" will configure TCP port for HTTP server working inband with default value of 80.

### Examples

The following example shows how to set inband http server TCP port:

```
Switch# configure terminal
Switch(config)# http server source port 1080
```

### Related Commands

http server load

service http enable

service https enable

## 2.11.8 http server source ssl-port

### Command Purpose

To configure the TCP port for HTTPS server working inband on your switch, use the http server source ssl-port command in Global Configuration. To restore the default value, use the no form of this command.

### Command Syntax

http server source ssl-port *PORT*

no http server source ssl-port

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PORT | Configure TCP port for HTTPS server working inband | 1025-65535 |

## Command Mode

Global Configuration

## Default

443

## Usage

The CLI of "no http server source ssl-port" will configure TCP port for HTTPS server working inband with default value of 443.

## Examples

The following example shows how to set inband https server TCP port:

```
Switch# configure terminal
Switch(config)# http server source port 10443

Switch# configure terminal
Switch(config)# http server source ssl-port 10443
```

## Related Commands

http server load

service http enable

service https enable

# 2.11.9 http server source mgmt-if port

## Command Purpose

To configure the TCP port for HTTP server working outband on your switch, use the http server source mgmt-if port command in Global Configuration. To restore the default value, use the no form of this command.

## Command Syntax

http server source mgmt-if port *PORT*

no http server source mgmt-if port

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PORT | Configure TCP port for HTTP server working outband | 1025-65535 |

## Command Mode

Global Configuration

## Default

80

## Usage

The CLI of "no http server source mgmt-if port" will configure TCP port for HTTP server working outband with default value of 80.

## Examples

The following example shows how to set outband http server TCP port:

```
Switch# configure terminal
Switch(config)# http server source mgmt-if port 1080
```

## Related Commands

http server load

service http enable

service https enable

## 2.11.10 http server source mgmt-if ssl-port

### Command Purpose

To configure the TCP port for HTTPS server working outband on your switch, use the http server source mgmt-if ssl-port command in Global Configuration. To restore the default value, use the no form of this command.

### Command Syntax

http server source mgmt-if ssl-port *PORT*

no http server source mgmt-if port

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PORT | Configure TCP port for HTTPS server working outband | 1025-65535 |

### Command Mode

Global Configuration

### Default

443

### Usage

The CLI of "no http server source mgmt-if ssl-port" will configure TCP port for HTTPS server working outband with default value of 443.

### Examples

The following example shows how to set outband https server TCP port:

```
Switch# configure terminal
Switch(config)# http server source port 10443
```

### Related Commands

http server load

service http enable

service https enable

## 2.11.11 http server ssl minimum-version

### Command Purpose

To configure the minimum tls version for HTTPS service. To restore the default value, use the no form of this command.

### Command Syntax

http server ssl minimum-version ( tls-1-0 | tls-1-1 | tls-1-2 )

no http server ssl minimum-version

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| tls-1-0 | TLSv1.0 | - |
| tls-1-1 | TLSv1.1 | - |
| tls-1-2 | TLSv1.2 | - |

### Command Mode

Global Configuration

### Default

tls-1-2

### Usage

The CLI of “http server ssl minimum-version” will take effect only restart https service.

### Examples

The following example shows how to set ssl minimum version

```
DUT1(config)# http server ssl minimum-version tls-1-1
```

### Related Commands

service https enable

## 2.11.12 http server ciphersuite

### Command Purpose

The command is used to specify the encryption suite for SSL (TLSv1.3 ciphersuite always be open).

Use the 'no' command to restore to default configuration (Open all ciphersuite).

### Command Syntax

http server ciphersuite [aes | aes128-gcm-sha256 | aes128-sha | aes128-sha256 | aes256-gcm-sha384 | aes256-sha | aes256-sha256 | all | camellia | dhe-dss-aes128-gcm-sha256 | dhe-dss-aes128-sha256 | dhe-dss-aes256-sha | dhe-rsa-aes128-gcm-sha256 | dhe-rsa-aes128-sha | dhe-rsa-aes128-sha256 | dhe-rsa-aes256-sha | dhe-rsa-aes256-sha256 | ecdhe-ecdsa-aes128-gcm-sha256 | ecdhe-ecdsa-aes128-sha | ecdhe-ecdsa-aes128-sha256 | ecdhe-ecdsa-aes256-gcm-sha384 | ecdhe-ecdsa-aes256-sha | ecdhe-ecdsa-aes256-sha384 | ecdhe-rsa-aes128-gcm-sha256 | ecdhe-rsa-aes128-sha | ecdhe-rsa-aes128-sha256 | ecdhe-rsa-aes256-gcm-sha384 | ecdhe-rsa-aes256-sha | ecdhe-rsa-aes256-sha384 | kedh-plus-aesgcm]

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| all | Open all ciphersuite(default) | - |
| aes | AES ciphersuite | - |
| aes128-gcm-sha256 | AES128-GCM-SHA256 ciphersuite | - |
| aes128-sha | AES128-SHA ciphersuite | - |
| aes128-sha256 | AES256-GCM-SHA384 ciphersuite | - |
| aes256-gcm-sha384 | Hmac-ripemd160 algorithm | - |
| aes256-sha | AES256-SHA ciphersuite | - |
| aes256-sha256 | AES256-SHA256 ciphersuite | - |
| camellia | CAMELLIA ciphersuite | - |

| | | |
|---|---|---|
| dhe-dss-aes128-gcm-sha256 | DHE-DSS-AES128-GCM-SHA256 ciphersuite | - |
| dhe-dss-aes128-sha256 | DHE-DSS-AES128-SHA256 ciphersuite | - |
| dhe-dss-aes256-sha | DHE-DSS-AES256-SHA ciphersuite | - |
| dhe-rsa-aes128-gcm-sha256 | DHE-RSA-AES128-GCM-SHA256 ciphersuite | - |
| dhe-rsa-aes128-sha | DHE-RSA-AES128-SHA ciphersuite | - |
| dhe-rsa-aes128-sha256 | DHE-RSA-AES128-SHA256 ciphersuite | - |
| dhe-rsa-aes256-sha | DHE-RSA-AES256-SHA ciphersuite | - |
| dhe-rsa-aes256-sha256 | DHE-RSA-AES256-SHA256 ciphersuite | - |
| ecdhe-ecdsa-aes128-gcm-sha256 | ECDHE-ECDSA-AES128-GCM-SHA256 ciphersuite | - |
| ecdhe-ecdsa-aes128-sha | ECDHE-ECDSA-AES128-SHA ciphersuite | - |
| ecdhe-ecdsa-aes128-sha256 | ECDHE-ECDSA-AES128-SHA256 ciphersuite | |
| ecdhe-ecdsa-aes256-gcm-sha384 | ECDHE-ECDSA-AES256-GCM-SHA384 ciphersuite | |
| ecdhe-ecdsa-aes256-sha | ECDHE-ECDSA-AES256-SHA ciphersuite | |
| ecdhe-ecdsa-aes256-sha384 | ECDHE-ECDSA-AES256-SHA384 ciphersuite | |
| ecdhe-rsa-aes128-gcm-sha256 | ECDHE-RSA-AES128-GCM-SHA256 ciphersuite | |
| ecdhe-rsa-aes128-sha | ECDHE-RSA-AES128-SHA ciphersuite | |
| ecdhe-rsa-aes128-sha256 | ECDHE-RSA-AES128-SHA256 ciphersuite | |
| ecdhe-rsa-aes256-gcm-sha384 | ECDHE-RSA-AES256-GCM-SHA384 ciphersuite | |
| ecdhe-rsa-aes256-sha | ECDHE-RSA-AES256-SHA ciphersuite | |
| ecdhe-rsa-aes256-sha384 | ECDHE-RSA-AES256-SHA384 ciphersuite | |
| kedh-plus-aesgcm | kEDH+AESGCM ciphersuite | |

## Command Mode

Global Configuration

## Default

None

## Usage

The command is used to specify the encryption suite for SSL,For safety reasons, the TSLv3.0 ciphersuite will always be open.

## Examples

The following example specifies that the http server uses ecdhe-rsa-aes128-sha256 as the SSL algorithm.

```
Switch# configure terminal
Switch(config)# http server ciphersuite ecdhe-rsa-aes128-sha256
```

## Related Commands

show http server ciphersuite

# 2.11.13 http authentication aaa

## Command Purpose

To configure the AAA method list for web login on your switch, use the http authentication aaa command in Global Configuration. To restore the default value, use the no form of this command.

## Command Syntax

http authentication ( local | aaa ( login-authentication | exec-authorization ) ( default | *LISTNAME* ) )

no http authentication ( aaa ( login-authentication | exec-authorization ) )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| local | Configure web login authentication by local | - |

| | | |
|---|---|---|
| aaa | Configure web login authentication by AAA | - |
| login-authentication | Configure web login authentication method list | - |
| exec-authorization | Configure web login authorization method list | - |
| default | Set method list name default | - |
| LISTNAME | Set method list name | Up to 31 characters |

## Command Mode

Global Configuration

## Default

default web login method is local

## Usage

The CLI of "http authentication (local |aaa (login-authentication|exec-authorization) (default|LISTNAME))" can only be configured when AAA is enable.

## Examples

The following example shows how to set web AAA login method to be default:

```
Switch# configure terminal
Switch(config)# http authentication aaa login-authentication default
```

## Related Commands

aaa new-model

aaa authentication login

aaa authorization exec

# 2.11.14 Show http server ciphersuite

## Command Purpose

This command is used to display the ciphersuite currently used by SSL.

## Command Syntax

show http server ciphersuite

## Command Mode

Privileged mode

## Default

None

## Usage

This command is used to display the ciphersuite currently used by SSL, the TSLv3.0 ciphersuite will always be open.

## Examples

The following example how to display the ciphersuite currently used by SSL.

```
Switch# configure terminal
Switch(config)# http server ciphersuite ecdhe-rsa-aes128-sha256
Switch# show http server ciphersuite
CIPHER-LIST = TLS_AES_256_GCM_SHA384:TLS_CHACHA20_POLY1305_SHA256:TLS_AES_128_GC
M_SHA256:ECDHE-RSA-AES128-SHA256

Switch#
```

## Related Commands

http server ciphersuite

# 2.12 RPC-API commands Commands

## 2.12.1 service rpc-api

### Command Purpose

To enable RPC-API service, use service rpc-api enable command in Global Configuration. To disable RPC-API service, use service rpc-api disable command.

### Command Syntax

service rpc-api ( enable ( port *PORT* | ssl ( ssl-port *SSLPORT* | ) | ) ( vrf *NAME* | ) | disable )

service rpc-api disable

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| enable | Turn on the RPC-API service | - |
| disable | Turn off the RPC-API service | - |
| PORT | TCP port number.<br>TCP port number.<br>By default, the RPC-API service listens on TCP port 80 (HTTP) | 1025-65535 |
| vrf NAME | VPN Routing/Forwarding instance | A string with 1-31 characters |
| ssl | Enable SSL (HTTPS) | - |
| SSLPORT | TCP port number.<br>TCP port number.<br>By default, the RPC-API service listens on TCP port 443 (HTTPS) | 1025-65535 |

### Command Mode

Global Configuration

### Default

Disabled.

### Usage

None

### Examples

The following example shows how to enable RPC-API service:

```
Switch# configure terminal
Switch(config)# service rpc-api enable port 2000
```

### Related Commands

show services rpc-api

service rpc-api auth-mode

## 2.12.2 service rpc-api auth-mode

### Command Purpose

To enable RPC-API HTTP Basic authentication.

### Command Syntax

service rpc-api auth-mode basic

no service rpc-api auth-mode

### Command Mode

Global Configuration

### Default

Disabled.

### Usage

Once enable or disable RPC-API HTTP Basic authentication, and users want to continue to use RPC-API service, users must re-enable it.

### Examples

The following example shows how to enable RPC-API HTTP Basic authentication:

```
Switch# configure terminal
Switch(config)# service rpc-api auth-mode basic
```

### Related Commands

service rpc-api enable

show services rpc-api

## 2.12.3 show services rpc-api

### Command Purpose

To show RPC-API configuration information.

### Command Syntax

show services rpc-api

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following example shows the configuration information:

```
Switch(config)# show services rpc-api
RPC API services configuration:
HTTP server:    shutdown, port: 80, authentication mode: none
```

### Related Commands

service rpc-api enable

# 2.13 DIAG Commands

## 2.13.1 diagnostic-information discard

### Command Purpose

Use this command to enable the function of diagnostic-information discard.

### Command Syntax

diagnostic-information discard enable

no diagnostic-information discard enable

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| enable | enable | The string of enable. |

### Command Mode

Global Configuration

### Default

no diagnostic-information discard enable

### Usage

The command uses to enable the function of diagnostic-information discard.

### Examples

The following example shows how to enable the function of diagnostic-information discard:

```
Switch(config)# diagnostic-information discard enable
```

The following example shows how to disable the function of diagnostic-information discard:

```
Switch(config)# no diagnostic-information discard enable
```

### Related Commands

N/A

## 2.13.2 show diagnostic-information discard

### Command Purpose

Use this command to display the situation of packet discard.

### Command Syntax

show diagnostic-information discard

clear diagnostic-information discard

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| discard | discard | The string of discard. |

### Command Mode

Privileged EXEC

### Default

None

### Usage

The command uses to dispaly the situation of packet discard.

### Examples

The following example shows how to display the situation of packet discard:

```
Switch# show diagnostic-information discard
Diagnostic-Information Discard:
```

```
Drop-Reason                    Description
-------------------------------+-----------------------------------
CTC_DROP_TTL_CHK               TTL check fail
CTC_DROP_ACL_DENY              Acl deny
CTC_DROP_PKT_ERR               Packet check error
CTC_DROP_ISOLATE_CHK           Port isolate check fail
CTC_DROP_TRANSIT_DISABLE       Transit disable
CTC_DROP_IP_CHK                Ip address or packet check fail
CTC_DROP_VLAN_FILTER           Vlan filtering
CTC_DROP_STP_CHK               Stp check fail
CTC_DROP_CHKSUM_ERR            Checksum error
CTC_DROP_PARSER_ERR            Parser error
CTC_DROP_TRAFFIC_MANAGER       Trafic manager check fail
CTC_DROP_NET_RX                Netrx check fail
CTC_DROP_NET_TX                Nettx check fail
Others                         Other drop reasons
```

The following example shows how to clear packet discard:

```
Switch# clear diagnostic-information discard
```

## Related Commands

N/A

# 3 Ethernet Commands

## 3.1 Interface Commands

### 3.1.1 bandwidth

#### Command Purpose

Use this command to set the bandwidth of the port.

To return the bandwidth to default value, use the no form of this command.

#### Command Syntax

bandwidth *BANDWIDTH*

no bandwidth

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| BANDWIDTH | port bandwidth | 1-100000000, unit：kbps |

#### Command Mode

Interface Configuration

#### Default

None

#### Usage

None

#### Examples

The following example set the bandwidth of the port:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# bandwidth 1000
```

The following example returns the bandwidth to default value:

```
Switch# configure terminal
Switch(config-if)# no bandwidth
```

### Related Commands

duplex

speed

## 3.1.2 clear counters

### Command Purpose

Use this command to clear the counters on the physical interface.

### Command Syntax

clear counters ( *IFNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | Only clear the specified interface statistics | Support physical/aggregation ports |

### Command Mode

Privileged EXEC

### Default

None

### Usage

The clear counters command clears all current interface counters from the interface unless you specify optional arguments that clear only a specific interface type from a specific interface number.

## Examples

The following example clears the counters on all interfaces:

```
Switch# clear counters
```

The following example clears the counters on the interface eth-0-1:

```
Switch# clear counters eth-0-1
```

The following example clears the counters on the agg1:

```
Switch# clear counters agg1
```

## Related Commands

None

# 3.1.3 description

## Command Purpose

Use this command to set the description on the interface.

To remove the description on the interface, use the no form of this command.

## Command Syntax

description *LINE*

no description

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LINE | The description on the interface | should be no more than 240 characters, and the character can not include '?' |

## Command Mode

Interface Configuration

## Default

None

## Usage

None

## Examples

The following example sets the description on the interface:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# description Ethernet
```

The following example removes the description on the interface:

```
Switch# configure terminal
Switch(config-if)# no description
```

## Related Commands

None

# 3.1.4 duplex

## Command Purpose

Use the duplex interface configuration command to specify the duplex mode of operation for a port. Use the no form of this command to return the port to its default value.

## Command Syntax

duplex ( auto | full | half )

no duplex

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| auto | Enable automatic duplex configuration; port automatically detects whether it should run in full-duplex or half-duplex mode, depending on the attached device mode | - |
| full | Enable full-duplex mode | - |

| | | |
|---|---|---|
| half | Enable half-duplex mode (only for interfaces operating at 10 or 100 Mb/s). You can not configure half-duplex mode for interfaces operating at 1000 or10,000 Mb/s | - |

## Command Mode

Interface Configuration

## Default

auto

## Usage

The command is not allowed to be set on 10G port or optical mode of combo port.

## Examples

The following example sets the duplex mode to auto:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# duplex auto
```

The following example sets the duplex mode to full:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# duplex full
```

The following example returns the duplex mode to default:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no duplex
```

## Related Commands

bandwidth

speed

## 3.1.5 speed

### Command Purpose

Use the speed interface configuration command to specify the speed of port. Use the no of this command to return the port to its default value.

### Command Syntax

speed ( 10 | 100 | 1000 | *2G5* | *5G* | *10G* | *25G* | *40G* | *50G* | *100G* | auto )

no speed

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| auto | Port automatically detects the speed it should run | - |
| 10 | Port runs at 10 Mb/s | - |
| 100 | Port runs at 100 Mb/s | - |
| 1000 | Port runs at 1000 Mb/s | - |
| 2G5 | Port runs at 2.5Gb/s | - |
| 5G | Port runs at 5Gb/s | - |
| 10G | Port runs at 10Gb/s | - |
| 25G | Port runs at 25Gb/s | - |
| 40G | Port runs at 40Gb/s | - |
| 50G | Port runs at 50Gb/s | - |
| 100G | Port runs at 100Gb/s | - |

### Command Mode

Interface Configuration

### Default

auto

### Usage

The command is not allowed to be set on optical mode of combo port.

## Examples

This example shows how to set the speed on a port to 1000 Mb/s:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# speed 1000
```

This example shows how to return the speed on a port to default value:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no speed
```

## Related Commands

bandwidth

duplex

# 3.1.6 group-speed

## Command Purpose

Use the group-speed interface configuration command to specify the speed of group port. After any port of the group uses this command, all ports of the same group will be configured to the same speed.

## Command Syntax

group-speed ( 1000 | *10G* | *25G* | default )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| 1000 | Port runs at 1000 Mb/s | - |
| 10G | Port runs at 10Gb/s | - |
| 25G | Port runs at 25Gb/s | - |
| default | Port runs at default speed | - |

## Command Mode

Interface Configuration

## Default

None

## Usage

The command is only used by group port, anyone port of the group uses this command, all port of the same group will be configured to the same speed.

## Examples

This example shows how to set the speed on a port of group to 1000 Mb/s:

```
Switch# configure terminal
Switch(config)# interface eth-0-49
Switch(config-if)# group-speed 1000
% Warning: Speed of Port eth-0-49, eth-0-50, eth-0-51, eth-0-52 will all be
switched to 1000M after entering this CLI
```

## Related Commands

show group-id info

bandwidth

duplex

# 3.1.7 interface

## Command Purpose

Use this command to enter interface mode.

## Command Syntax

interface *IFNAME*

no interface *IFNAME*

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| IFNAME | The name of interface, i.e. eth-0-1, agg1, vlan1,loopback1.<br>Only vlan interface is supported to be removed by the "no interface" command. | Support all interface types |

## Command Mode

Global Configuration

## Default

None

## Usage

The interface name can be either a port name (i.e. eth-0-1) or link-agg name (i.e. agg1) or vlan name (i.e. vlan2) or loop-back name (i.e. loopback10) .

## Examples

The following example enters the interface mode for eth-0-1:

```
Switch(config)# interface eth-0-1
```

The following example enters the interface mode for agg1:

```
Switch(config)# interface agg1
```

The following example enters the interface mode for vlan2:

```
Switch(config)# interface vlan2
```

## Related Commands

exit

## 3.1.8 interface range

### Command Purpose

Use this command to operate a list of interfaces, the interface include physical port, vlan interface, linkagg interface and loopback interface.

### Command Syntax

interface range *IFNAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | Interface range | Support all interface types can be separate by comma, dash |

### Command Mode

Global Configuration

### Default

None

### Usage

None

### Examples

The following example operate a list of physical interface:

```
Switch(config)# interface range eth-0-1 - 24
Switch(config-if-range)# shutdown
```

The following example operate a list of vlan interface:

```
Switch(config)# interface range vlan 1 - 20
Switch(config-if-range)# shutdown
```

The following example operate a list of linkagg interface:

```
Switch(config)# interface range agg 10 - 20
Switch(config-if-range)# shutdown
```

The following example operate a list of loopback interface:

```
Switch(config)# interface range loopback 0 - 5
Switch(config-if-range)# shutdown
```

### Related Commands

None

## 3.1.9 interface range create vlan

### Command Purpose

Use this command to create a list of vlan interface.

### Command Syntax

interface range create vlan *VLAN_RANGE*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_RANGE | VLAN ID range | VLAN ID range is 1-4094, can be separate by comma, dash |

### Command Mode

Global Configuration

### Default

None

### Usage

None

### Examples

The following example create vlan interface 10 to 20:

```
Switch(config)# interface range create vlan 10 - 20
Switch(config-if-range)# shutdown
```

### Related Commands

None

## 3.1.10 jumboframe

### Command Purpose

Use this command to enable jumbo frame. To disable jumbo frame, use the no form of this command.

### Command Syntax

jumboframe enable

no jumboframe enable

### Command Mode

Interface Configuration

### Default

None

### Usage

Jumboframe is disabled by default. The max frame which can be transmitted is 1534 bytes. When enable jumboframe, the max frame can be 9600 bytes.

### Examples

The following example enables the jumboframe:

```
Switch(config)# interface eth-0-1
Switch(config-if)# jumboframe enable
```

The following example disables the jumboframe:

```
Switch(config-if)# no jumboframe enable
```

## Related Commands

None

# 3.1.11 media-type

## Command Purpose

Use the media-type interface configuration command to select a media type for an interface. Use the no form of this command restore to the default value.

## Command Syntax

media-type ( auto-select | rj45 | sfp )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| auto-select | Enable the switch to dynamically select the type based on which one first links up | - |
| rj45 | Select the RJ-45 interface | - |
| sfp | Select the small form-factor pluggable (SFP) module interface | - |

## Command Mode

Interface Configuration

## Default

Auto-select

## Usage

By default, we use auto-select mode.

## Examples

The following example shows how to configure the interface as a rj45 media:

```
Switch(config)# interface eth-0-1
Switch(config-if)# media-type rj45
```

The following example shows how to restore to default value:

```
Switch(config-if)# no media-type
```

### Related Commands

None

## 3.1.12 unidirectional

### Command Purpose

Use the unidirectional interface configuration command to enable/disable unidirectional function.

### Command Syntax

unidirectional ( enable | disable )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| enable | enable unidirectional function | - |
| disable | disable unidirectional function | - |

### Command Mode

Interface Configuration

### Default

disable unidirectional function

### Usage

Enable unidirectional function will force enable the interface TX function and force disable the interface RX function.

Only fiber port support the unidirectional function, and in 1000M speed mode, duplex must be forced to full mode.

### Examples

The following example shows how to enable unidirectional function:

```
Switch(config)# interface eth-0-1
Switch(config-if)# unidirectional enable
```

The following example shows how to disable unidirectional function:

```
Switch(config-if)# unidirectional disable
```

### Related Commands

None

## 3.1.13 shutdown

### Command Purpose

Use the shutdown interface configuration command to admin down an interface. Use the no form of this command to admin up an interface.

### Command Syntax

shutdown

no shutdown

### Command Mode

Interface Configuration

### Default

None

### Usage

None

## Examples

The following example shows how to shutdown a port:

```
Switch(config)# interface eth-0-1
Switch(config-if)# shutdown
```

The following example shows how to admin up a port:

```
Switch(config-if)# no shutdown
```

## Related Commands

None

# 3.1.14 split interface

## Command Purpose

Use the command to split physic port to 10G port. Use the no form of this command to un-split the physic port.

## Command Syntax

split interface *IFNAME* ( 10giga | 40giga )

no split interface

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | the physic port need to split | Support physical ports |
| 10giga | split physic port to four 10G port | - |
| 40giga | split physic port to one 10G port | - |

## Command Mode

Global Configuration

## Default

None

## Usage

Need save configuration and reboot to make command take effect

## Examples

The following example shows how to split interface to four 10G port:

```
Switch# configure terminal
Switch(config)# split interface eth-0-1 10giga
```

## Related Commands

None

# 3.1.15 load-interval

## Command Purpose

Use the load-interval interface configuration command to specify the interval when calculating speed of an interface. Use the no of this command to return the port to its default value.

## Command Syntax

load-interval *SECONDS*

no load-interval

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SECONDS | Load interval | 5-600, unit:second |

## Command Mode

Interface Configuration

## Default

300 seconds

## Usage

Load-interval must be in increments of 5 second and its default value is 300 second.

## Examples

This example shows how to set the load-interval on a port to 600 second:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# load-interval 600
```

This example shows how to return the load-interval on a port to default value:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no load-interval
```

## Related Commands

show interface

# 3.1.16 vlan dot1q tag native

## Command Purpose

Use the vlan dot1q tag native global configuration command to configure the edge switch so that all packets going out an 802.1Q trunk, including the native VLAN.

Use this command to enable tagging all native vlan.

## Command Syntax

vlan dot1q tag native

no vlan dot1q tag native

## Command Mode

Interface Configuration

## Default

None

## Usage

Use this command to enable tagging native. If enabled, the packet in native vlan will be tagged with the native vlan. Otherwise, it will be untagged.

## Examples

This example shows how to tag native for trunk port:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# vlan dot1q tag native
```

This example shows how to disable tagging native for trunk port:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no vlan dot1q tag native
```

## Related Commands

None

# 3.1.17 show interface

## Command Purpose

Use this command to display the configurations and statistics on all interfaces or an interface.

## Command Syntax

show interface ( *IFNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | The interface name | eth:Physical interface<br>agg:Aggregation interface<br>loopback:Loopback interface<br>vlan:Vlan interface<br>tunnel:Tunnel interface<br>null:Null interface |

## Command Mode

Privileged EXEC

## Default

None

## Usage

The OAM statistics can only display when port is 10G mode.

## Examples

This example shows how to display the configurations and statistics on the interface eth-0-1:

```
Switch# show interface eth-0-1
Interface eth-0-1
  Interface current state: UP
  Hardware is Ethernet, address is 001e.080a.5102 (bia 001e.080a.5102)
  Bandwidth 1000000 kbits
  Index 1 , Metric 1 , Encapsulation ARPA
  Speed - 1000Mb/s , Duplex - Full  , Media type is 1000BASE_T_SFP
  Up count: 0
  Down count: 0
  Link type is autonegotiation
  Admin input flow-control is off, output flow-control is off
  Oper input flow-control is off, output flow-control is off
  The Maximum Frame Size is 1632 bytes
  VRF binding: not bound
  ARP timeout 01:00:00,  ARP retry interval 1s
  ARP Proxy is disabled, Local ARP Proxy is disabled
    5 minute input rate 0 bits/sec, 0 packets/sec
    5 minute output rate 0 bits/sec, 0 packets/sec
    0 packets input, 0 bytes
    Received 0 unicast, 0 broadcast, 0 multicast
    0 runts, 0 giants, 0 input errors, 0 CRC
    0 frame, 0 overrun, 0 pause input
    24 packets output, 2160 bytes
    Transmitted 0 unicast, 24 broadcast, 0 multicast
    0 underruns, 0 output errors, 0 pause output
    0 output discard
    5 minute input utility rate 0.00%
    5 minute output utility rate 0.00%
```

## Related Commands

show interface status

# 3.1.18 show interface status

## Command Purpose

Use this command to display the brief information on all Ethernet and link aggregation interfaces.

## Command Syntax

show interface ( *IFNAME* | ) status

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | The interface name | Support aggregation and physical ports |

## Command Mode

Privileged EXEC

## Default

None

## Usage

This command will not show VLAN and tunnel interfaces' information.

## Examples

This example shows how to display the brief information on all Ethernet and LAG interfaces:

```
Switch# show interface status
Port       Status     Duplex   Speed    Mode    Type     Description
------------------------------------------------------------------
eth-0-1    down       a-full   a-1000   ACCESS  1000BASE_T
eth-0-2    down       a-full   a-1000   ACCESS  1000BASE_T
eth-0-3    admin down auto     auto    ACCESS  1000BASE_T
```

```
eth-0-4    admin down auto     auto    ACCESS  1000BASE_T
eth-0-5    up         a-full   a-1000   routed  1000BASE_T
eth-0-6    up         a-full   a-100     ACCESS  1000BASE_T
eth-0-7    admin down auto     auto     ACCESS  1000BASE_T
eth-0-8    admin down auto     auto     ACCESS  1000BASE_T
eth-0-9    down       a-full   a-1000    ACCESS  1000BASE_T
eth-0-10   down       a-full   a-1000    ACCESS  1000BASE_T
eth-0-11   admin down auto     auto     ACCESS  1000BASE_T
eth-0-12   admin down auto     auto     ACCESS  1000BASE_T
eth-0-13   admin down auto     auto     ACCESS  1000BASE_T
eth-0-14   admin down auto     auto     ACCESS  1000BASE_T
eth-0-15   admin down auto     auto     ACCESS  1000BASE_T
eth-0-16   admin down auto     auto     ACCESS  1000BASE_T
eth-0-17   admin down auto     auto     ACCESS  1000BASE_T
eth-0-18   admin down auto     auto     ACCESS  1000BASE_T
eth-0-19   admin down auto     auto     ACCESS  1000BASE_T
eth-0-20   admin down auto     auto     ACCESS  1000BASE_T
```

### Related Commands

None

## 3.1.19 show interface summary

### Command Purpose

Use this command to display the summary on all interfaces or an interface.

### Command Syntax

show interface ( *IFNAME* | ) summary

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | The interface name | Support all interface types |

### Command Mode

Privileged EXEC

### Default

None

## Usage

This command will display the summary on all interfaces or an interface in the form of list.

## Examples

This example shows how to display the summary on the interface eth-0-1:

```
Switch# show interface eth-0-1 summary
RXBS: rx rate (bits/sec)        RXPS: rx rate (pkts/sec)
RXUTI: rx utility rate
TXBS: tx rate (bits/sec)        TXPS: tx rate (pkts/sec)
TXUTI: tx utility rate

Interface    Link  RXBS          RXPS          RXUTI         TXBS          TXPS
TXUTI
-------------------------------------------------------------------------------
-----------
eth-0-1      DOWN  0             0             0.00%         0             0
0.00%
```

## Related Commands

show interface

# 3.1.20 show ip interface

## Command Purpose

Use this command to show layer3 interface information.

## Command Syntax

show ip interface ( *IFNAME* | )

show ip interface brief

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | The interface name, can be eth, vlan or agg | Support all interface types |

## Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows the vlan interface information:

```
Switch# show interface vlan10
Interface vlan10
  Interface current state: DOWN
  Hardware is VLAN, address is 8633.d260.6500 (bia 8633.d260.6500)
  Bandwidth 1000000 kbits
  Index 4098 , Metric 1 , Encapsulation ARPA
  The maximum transmit unit (MTU) is 1500 bytes
  VRF binding: not bound
  Label switching is disabled
  No virtual circuit configured
  VRRP master of :  VRRP is not configured on this interface
  ARP timeout 01:00:00,  ARP retry interval 1s
```

### Related Commands

None

## 3.1.21 switchport

### Command Purpose

Use this command to configure a port to a bridge (layer 2) or routing (layer 3) mode.

### Command Syntax

switchport

no switchport

### Command Mode

Interface Configuration

### Default

Switchport

### Usage

When using this command to change the mode of a port, all bridge or routing configurations of this port will be cleared and not restored. By default, the port is a switchport.

### Examples

This example shows how to configure a port to bridge mode:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# switchport
```

This example shows how to configure a port to routing mode:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport
```

### Related Commands

None

## 3.1.22 switchport access allowed

### Command Purpose

Use this command to configure whether the specified VLAN flow can pass this access port.

### Command Syntax

switchport access allowed vlan ( add | remove ) *VLAN_ID*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| add | Allow the traffic from the vlan to pass the access port | - |
| remove | Not allow the traffic from the vlan to pass the access port | - |
| VLAN_ID | Vlan list connected with '-' and ',', for example, "1-10,15,20,30-40" | 1-4094 |

## Command Mode

Interface Configuration

## Default

1

## Usage

This command is used to allow the traffic from the specific VLAN to pass the access port.

## Examples

This example shows how to configure the specified VLAN flow pass through the port:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# switchport access allowed vlan add 10
```

This example shows how to allow the traffic from the vlan11 to pass the port:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# switchport access allowed vlan add 11
```

This example shows how to refuse the traffic from the vlan12 to pass the port:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# switchport access allowed vlan remove 12
```

### Related Commands

switchport trunk allowed vlan (add vid | remove vid| all | none)

## 3.1.23 switchport access vlan

### Command Purpose

Use this command to set the default VLAN for access port.

### Command Syntax

switchport access vlan *VLAN_ID*

no switchport access vlan

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan id | 2-4094 |

### Command Mode

Interface Configuration

### Default

1

### Usage

The port should be an access port by switchport mode access command before add to vlan by this command.

### Examples

This example shows how to configure the access port to add to default vlan 10:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# switchport mode access
Switch(config-if)# switchport access vlan 10
```

This example shows how to configure the access port to restore to default vlan 1:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport access vlan
```

### Related Commands

switchport trunk native

## 3.1.24 switchport mode access

### Command Purpose

Use this command to configure the port work in access mode.

### Command Syntax

switchport mode access

### Command Mode

Interface Configuration

### Default

Access Port

### Usage

The access mode is usually used to connect the port to a terminal device, such as a PC.

When the mode is changed, both the MAC learnt dynamically and configured statically on the port will be cleared.

### Examples

This example shows how to set the switchport mode to access:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# switchport mode access
```

### Related Commands

switchport mode trunk

## 3.1.25 switchport mode trunk

### Command Purpose

Use this command to configure the port work in trunk mode.

### Command Syntax

switchport mode trunk

### Command Mode

Interface Configuration

### Default

Access Port

### Usage

The trunk mode is usually used to connect the port with other switch.

The trunk mode is can also used to connect the port with host device.

When the mode is changed, both the MAC learnt dynamically and configured statically on the port will be cleared.

### Examples

This example shows how to return the port to default vlan 1:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# switchport mode trunk
```

### Related Commands

switchport mode access

## 3.1.26 switchport mode dot1q-tunnel

### Command Purpose

Use this command to configure the port as QINQ port.

### Command Syntax

switchport mode dot1q-tunnel

### Command Mode

Interface Configuration

### Default

Access Port

### Usage

When port mode changed, all the dynamic FDB will be cleared.

### Examples

This example shows how to configure the port to QINQ mode:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# switchport mode dot1q-tunnel
```

### Related Commands

switchport mode trunk

## 3.1.27 switchport trunk allowed

### Command Purpose

Use this command to configure whether the specified VLAN flow can pass this trunk port.

Use this command to allow traffic from specified VLAN to transmit the trunk port.

To remove this setting, use the no form of this command.

## Command Syntax

switchport trunk allowed vlan ( add *VLAN_ID* | remove *VLAN_ID* | all | none )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| add VLAN_ID | allow the traffic from the specified vlan to transmit the trunk port. Vlan list connected with '-' and ',', for example, "1-10,15,20,30-40" | 1-4094 |
| remove VLAN_ID | do not allow the traffic from the specified vlan to transmit the trunk port. Vlan list connected with '-' and ',', for example, "1-10,15,20,30-40" | 1-4094 |
| all | allow the traffic from all the vlan to transmit the trunk port | - |
| none | do not allow the traffic from all the vlan to transmit the trunk port | - |

## Command Mode

Interface Configuration

## Default

1

## Usage

This command is used to allow traffic from specified VLAN to transmit the trunk port.

## Examples

This example shows how to configure the specified VLAN flow pass through the port:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# switchport trunk allowed vlan add 10
```

This example shows how to refuse traffic fromthe specified VLAN to transmit the trunk port:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# switchport trunk allowed vlan remove 11,12
```

This example shows how to allow traffic from all vlan to transmit the trunk port:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# switchport trunk allowed vlan all
```

This example shows how to refuse traffic from all vlan to transmit the trunk port:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# switchport trunk allowed vlan none
```

### Related Commands

switchport access allowed vlan (add | remove) vid

## 3.1.28 switchport trunk native vlan

### Command Purpose

Use this command to set the default VLAN for trunk port.

### Command Syntax

switchport trunk native vlan *VLAN_ID*

no switchport trunk native vlan

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan id | 2-4094 |

### Command Mode

Interface Configuration

## Default

1

## Usage

The port should be a trunk port by switchport mode trunk command before add to vlan by this command.

## Examples

This example shows how to configure default vlan 10 for trunk port:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# switchport mode trunk
Switch(config-if)# switchport trunk native vlan 10
```

This example shows how to configure the trunk port to restore to default vlan 1:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport trunk native vlan
```

## Related Commands

switchport access vlan vid

# 3.1.29 switchport port-bridge enable

## Command Purpose

Use this command to enable port-bridge, allow homologous and homologous translate.

## Command Syntax

switchport port-bridge enable

no switchport port-bridge enable

### Command Mode

Interface Configuration

### Default

None

### Usage

None

### Examples

This example shows how to enable port-bridge:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# switchport port-bridge enable
```

### Related Commands

port-bridge enable

## 3.1.30 port-bridge enable

### Command Purpose

Use this command to enable port-bridge suppoort multicast and broadcast.

### Command Syntax

port-bridge enable

no port-bridge enable

### Command Mode

Global Configuration

## Default

None

## Usage

None

## Examples

This example shows how to enable port-bridge support multicast and broadcast:

```
Switch# configure terminal
Switch(config)# port-bridge enable
```

## Related Commands

switchport port-bridge enable

# 3.1.31 port-xconnect

## Command Purpose

Use this command to set port cross connect destination interface.Use the no form of this command remove destination interface.

## Command Syntax

port-xconnect destination-interface ( *IFPHYSICAL* | *IFAGG* )

no port-xconnect destination-interface

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFPHYSICAL | Physical port | N/A |
| IFAGG | Aggregate port | - |

## Command Mode

Interface Configuration

### Default

None

### Usage

None

### Examples

This example shows how to set eth-0-1 port-xconnect destination interface to eth-0-2:

```
Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# interface eth-0-1
Switch(config-if)# port-xconnect destination-interface eth-0-2
```

### Related Commands

None

## 3.1.32 carrier up-hold-time interval

### Command Purpose

Use this command to set port up hold time.Use the no form of this command remove port up hold time.

### Command Syntax

carrier up-hold-time interval *TIME*

no carrier up-hold-time interval

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| TIME | up hold time | 0-3600000,unit is millisecond |

### Command Mode

Interface Configuration

### Default

0

### Usage

None

### Examples

This example shows how to set 300ms for eth-0-1 up hold time:

```
Switch(config)# interface eth-0-1
Switch(config-if)# carrier up-hold-time interval 300
```

### Related Commands

None

## 3.1.33 carrier down-hold-time interval

### Command Purpose

Use this command to set port down hold time.Use the no form of this command remove port down hold time.

### Command Syntax

carrier down-hold-time interval *TIME*

no carrier down-hold-time interval

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| TIME | down hold time | 0-3600000,unit is millisecond |

### Command Mode

Interface Configuration

### Default

0

### Usage

None

### Examples

This example shows how to set 300ms for eth-0-1 down hold time:

```
Switch(config)# interface eth-0-1
Switch(config-if)# carrier down-hold-time interval 300
```

### Related Commands

None

## 3.1.34 mtu

### Command Purpose

Use this command to configure the maximum transmit unit for this interface.

### Command Syntax

mtu *VALUE*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VALUE | MTU | 68-9216 |

### Command Mode

Interface Configuration

### Default

1500

## Usage

This command is only allowed to be used in layer3 interface.

## Examples

This example shows how to configure MTU 1600 for VLAN interface 10:

```
Switch# configure terminal
Switch(config)# interface vlan10
Switch(config-if)#mtu 1600
```

## Related Commands

None

# 3.1.35 wavelength freq

## Command Purpose

Use this command to configure the wavelength of tunable fiber used on this interface.Use the no form of this command restore to the default value.Each wavelength corresponds to a fixed frequency and the command sets the wavelength by configuring the frequency.

## Command Syntax

wavelength freq *FREQ*

no wavelength freq

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| FREQ | fiber frequency | 19110-19615,step is 5 |

## Command Mode

Interface Configuration

## Default

19340

## Usage

The configurations of this command only effective when the tunable fiber is inserted on this interface.

## Examples

This example shows how to configure wavelength freq 19120 for interface 10:

```
Switch# configure terminal
Switch(config)# interface eth-0-10
Switch(config-if)#wavelength freq 19120
```

## Related Commands

None

# 3.1.36 fec

## Command Purpose

Use this command to set fec function for a port. And use the no form of this command to unset fec function for a port.

## Command Syntax

fec ( none | baser | rs )

no fec

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| none | fec none | - |
| baser | fec baser | - |
| rs | fec rs | - |

## Command Mode

Interface Configuration

## Default

no fec

## Usage

FEC is support on 10G/40G/25G/50G/100G physical interface

## Examples

The following example shows how to enable fec rs function for a port:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if-eth-0-1)# fec  rs
```

The following example shows how to disable fec function for a port:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if-eth-0-1)# fec none
```

The following example shows how to set default fec function for a port:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if-eth-0-1)# no fec
```

## Related Commands

None

# 3.1.37 mdi

## Command Purpose

Use this command to set MDI crossover mode for ethernet port. And use the no form of this command to unset MDI mode for ethernet port

## Command Syntax

mdi ( across | auto | normal )

no mdi

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| auto | automatic MDI crossover | - |
| across | Copper media forced to MDIX | - |

| | | |
|---|---|---|
| normal | Copper media forced to MDI | - |

## Command Mode

Interface Configuration

## Default

auto

## Usage

MDI is support on ethernet interface

## Examples

The following example shows how to set automatic MDI crossover:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if-eth-0-1)# mdi auto
```

The following example shows how to set MDIX mode:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if-eth-0-1)# mdi across
```

The following example shows how to set MDI mode:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if-eth-0-1)# mdi normal
```

## Related Commands

None

# 3.2 Interface Errdisable Commands

## 3.2.1 errdisable detect

### Command Purpose

Use the interface errdisable detects configuration command to enable errdisable detection. Use the no form of this command to disable errdisable detection.

### Command Syntax

errdisable detect reason ( link-flap | fdb-loop | udld )

no errdisable detect reason ( link-flap | fdb-loop | udld )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| link-flap | Enable detect Link flap error | - |
| fdb-loop | Enable detect FDB error | - |
| udld | Enable detect UDLD error | - |

### Command Mode

Global Configuration

### Default

link-flap Enable

fdb-loop Enable

udld Enable

### Usage

None

### Examples

This example shows how to enable errdisable detect link flap:

```
Switch# configure terminal
Switch(config)# errdisable detect reason link-flap
```

This example shows how to disable errdisable detect link flap:

```
Switch# configure terminal
Switch(config)# no errdisable detect reason link-flap
```

### Related Commands

show errdisable detect

## 3.2.2 errdisable recovery interval

### Command Purpose

Use this command to set the specified timer to recover from the errdisable state. Use the no form of this command to restore to the default interval.

### Command Syntax

errdisable recovery interval *RANGE*

no errdisable recovery interval

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| RANGE | Recovery interval range | 30-86400, unit:second |

### Command Mode

Global Configuration

### Default

300 seconds

### Usage

Default recovery interval is 300 seconds.The change of interval will not affect already started errdisable recovery timer.If not enable errdisable recovery, the port will not revoery automatic.

## Examples

This example shows how to set errdisable recovery to 30 seconds:

```
Switch# configure terminal
Switch(config)# errdisable recovery interval 30
```

This example shows how to set errdisable recovery to default values:

```
Switch# configure terminal
Switch(config)# no errdisable recovery interval
```

## Related Commands

errdisable recovery reason

show errdisable recovery

# 3.2.3 errdisable fdb-loop count

## Command Purpose

Use this command to set FDB-loop check parameter. Use the no form of this command to restore to the default count.

## Command Syntax

errdisable fdb-loop count *COUNT*

no errdisable fdb-loop count

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| COUNT | Set the FDB-loop times, default 10. | 3-50 |

## Command Mode

Global Configuration

## Default

10

## Usage

Period is 60s.

## Examples

This example shows how to set count 5:

```
Switch# configure terminal
Switch(config)# errdisable fdb-loop count 5
```

## Related Commands

errdisable recovery reason

show errdisable recovery

show errdisable fdb-loop

# 3.2.4 errdisable fdb-loop exclude-vlan

## Command Purpose

Use this command to set FDB-loop vlan white list. Use the no form of this command to detect the specified vlan.

## Command Syntax

errdisable fdb-loop exclude-vlan *VLAN_LIST*

no errdisable fdb-loop exclude-vlan

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_LIST | Set the vlan list that not need FDB-loop detect | Connected with '-' and ',', for example, "1-10,15,20,30-40" |

## Command Mode

Global Configuration

## Default

None

## Usage

None

## Examples

This example shows how to set exclude-vlan 1,5-7:

```
Switch# configure terminal
Switch(config)# errdisable fdb-loop exclude-vlan 1,5-7
```

## Related Commands

show errdisable fdb-loop

# 3.2.5 errdisable recovery reason

## Command Purpose

Use this command to enable error disable detection for a specified cause or all cause. Use the no form of this command to disable the error disable feature.

## Command Syntax

errdisable recovery reason ( all | bpduguard | bpduloop | port-security | link-flap | link-monitor-failure | oam-remote-failure | udld | fdb-loop | loopback-detection )

no errdisable recovery reason ( all | bpduguard | bpduloop | port-security | link-flap | link-monitor-failure | oam-remote-failure | udld | fdb-loop | loopback-detection )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| all | Enable timer to recover from all reason | - |
| bpduguard | Enable timer to recover from BPDU Guard error disable state | - |

| | | |
|---|---|---|
| bpduloop | Enable timer to recover from BPDU Loopback error disable state | - |
| port-security | Enable timer to recover from Port security failure | - |
| link-flap | Enable timer to recover from Link flap failure | - |
| link-monitor-failure | Enable timer to recover from link monitoring failure | - |
| oam-remote-failure | Enable timer to recover from OAM detected remote failure | - |
| udld | Enable timer to recover from UDLD failure | - |
| fdb-loop | Enable timer to recover from FDB loop failure | - |
| loopback-detection | Enable timer to recover from loopback detection error disable state | - |
| cfm-failure | Enable timer to recover from cfm failure error disable state | - |

## Command Mode

Global Configuration

## Default

Disabled

## Usage

The change of reason will not affect those interfaces have already enter errdisable state.

## Examples

This example shows how to enable link flap errdisable recovery:

```
Switch# configure terminal
Switch(config)# errdisable recovery reason link-flap
```

This example shows how to disable link flap errdisable recovery:

```
Switch# configure terminal
Switch(config)# no errdisable recovery reason link-flap
```

### Related Commands

errdisable recovery interval

show errdisable recovery

## 3.2.6 errdisable flap

### Command Purpose

Use this command to set the parameters for link-flap error disable. Use the no form of this command to restore to default value.

### Command Syntax

errdisable flap reason link-flap *COUNT SECONDS*

no errdisable flap reason link-flap *COUNT SECONDS*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| link-flap | Configure link flap conditions | - |
| COUNT | Max flap count | 1-100, unit:times |
| SECONDS | Flap count time in seconds | 1-120, unit:second |

### Command Mode

Global Configuration

### Default

count : 10, seconds :10

### Usage

Only the link flap can be detected. <1-100> is the threshold of flap count, and <1-120> is the count time in seconds for flap count. If the errdisable detect link flap is enabled, will result in link flap errdisable, otherwise, will only print a message in log.

### Examples

This example shows how to set link flap conditions to 20 times in 60 seconds:

```
Switch# configure terminal
Switch(config)# errdisable flap reason link-flap 20 60
```

This example shows how to disable link flap conditions to default:

```
Switch# configure terminal
Switch(config)# no errdisable flap reason link-flap
```

### Related Commands

show errdisable flap

## 3.2.7 show errdisable detect

### Command Purpose

Use this command to display the error disable detection reason.

### Command Syntax

show errdisable detect

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to display the error disable detection reason:

```
DUT1# show errdisable detect
ErrDisable Reason        Detection status
-----------------        ----------------
bpduguard                Enabled
bpduloop                 Enabled
link-monitor-failure     Enabled
oam-remote-failure       Enabled
port-security            Enabled
link-flap                Enabled
monitor-link             Enabled
udld                     Disabled
fdb-loop                 Disabled
loopback-detection       Enabled
reload-delay             Enabled
dual-active-conflict     Enabled
cfm-failure              Enabled
```

### Related Commands

errdisable detect

## 3.2.8 show errdisable recovery

### Command Purpose

Use this command to display the error disable recovery timer.

### Command Syntax

show errdisable recovery

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

## Examples

This example shows how to display the error disable recovery:

```
Switch# show errdisable recovery
ErrDisable Reason        Timer Status
-----------------        --------------
bpduguard                Disabled
bpduloop                 Disabled
link-monitor-failure     Disabled
oam-remote-failure       Disabled
port-security            Disabled
link-flap                Disabled
udld                     Disabled
fdb-loop                 Disabled
loopback-detection       Disabled
dual-active-conflict     Disabled
cfm-failure              Disabled

Timer interval: 300 seconds
```

## Related Commands

errdisable recovery interval

errdisable recovery reason

# 3.2.9 show errdisable flap

## Command Purpose

Use this command to display error disable link flap parameters.

## Command Syntax

show errdisable flap

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to display the flap configuration:

```
Switch# show errdisable flap
ErrDisable Reason        Flaps     Time (sec)
-----------------        ------    ----------
link-flap                10        10
```

## Related Commands

errdisable flap

# 3.2.10 show errdisable fdb-loop

## Command Purpose

Use this command to display error disable fdb-loop parameters.

## Command Syntax

show errdisable fdb-loop

## Command Mode

Privileged EXEC

## Default

None

## Usage

When mac address migrates from one port to another port for 10 times in one minute, this mac address is considered as flapping and switch would print a flapping log for users. The log would be printed every 10 minutes.

## Examples

This example shows how to display the fdb-loop configuration:

```
Switch# show errdisable fdb-loop
Errdisable FDB loop information
------------------------------------------------------------------------
Exclude VLAN-list                  : N/A
Detecting count                    : 10
Detecting period                   : 60s
Printing log period                : 600s
```

## Related Commands

None

# 3.2.11 errdisable fdb-loop trust

## Command Purpose

Use this command to set trust mode on interface， and this interface would not be set error disable by fdb-loop detection.

Use the no form of this command to disable the error disable feature.

## Command Syntax

errdisable fdb-loop trust

no errdisable fdb-loop trust

## Command Mode

Interface Configuration

## Default

None

## Usage

None

### Examples

This example shows how to set trust mode on interface for fdb flap:

```
DUT1(config)# interface eth-0-1
DUT1(config-if)# errdisable fdb-loop trust
```

This example shows how to unset trust mode on interface for fdb flap:

```
DUT1(config)# interface eth-0-1
DUT1(config-if)# no errdisable fdb-loop trust
```

### Related Commands

None

## 3.3 MAC Address Table Commands

### 3.3.1 mac-address-table aging-time

### Command Purpose

Use the mac-address-table aging-time global configuration command on the switch to set the length of time that a dynamic entry remains in the MAC address table after the entry is used or updated. Use the no form of this command to return to the default setting. The aging time applies to all VLANs.

### Command Syntax

*mac_address-table* aging-time *SECONDS*

no *mac_address-table* aging-time

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SECONDS | Aging time. | 0，10-1000000，0 means that MAC aging function does not work，unit:second |

### Command Mode

Global Configuration

### Default

The default is 300 seconds

### Usage

If packets are not received continuously, user can increase the aging time to make the system recording the dynamic entries for a longer time. Increasing the time can reduce the possibility of flooding when the hosts send again.

### Examples

This example shows how to set the aging time to 200 seconds for all VLANs:

```
Switch# configure terminal
Switch(config)# mac-address-table aging-time 200
```

### Related Commands

show mac address-table aging-time

## 3.3.2 mac-address-table hardware-learning

### Command Purpose

Use the mac-address-table hardware-learning enable global configuration command on the switch to study FDB without software. Use the no form of this command to return to the default setting.

### Command Syntax

*mac_address-table* hardware-learning enable

no *mac_address-table* hardware-learning enable

### Command Mode

Global Configuration

## Default

Disable

## Usage

Hardware learning is more faster than software learning.

## Examples

This example shows how to enable hardware learning:

```
Switch# configure terminal
Switch(config)# mac-address-table hardware-learning enable
```

## Related Commands

None

# 3.3.3 mac-address-table forward

## Command Purpose

Use the mac-address-table forward global configuration command on the switch to add static addresses to the MAC address table. Use the no form of this command to remove static entries from the table.

## Command Syntax

*mac_address-table MAC_ADDR* forward ( *IFNAME* | eps *EPS_ID* | remote-vtep *REMOTE_VTEP_ID* | smart-link *SMART_LINK_ID* ) vlan *VLAN_ID*

no *mac_address-table MAC_ADDR* forward ( *IFNAME* | eps *EPS_ID* | remote-vtep *REMOTE_VTEP_ID* | smart-link *SMART_LINK_ID* ) vlan *VLAN_ID*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MAC_ADDR | Destination MAC address (unicast or multicast) to add to the address table. Packets with this destination address received in the specified VLAN are forwarded to the specified interface | Mac address in HHHH.HHHH.HHHH format |
| IFNAME | Interface to which the received packet is forwarded. | Valid interfaces include physical ports and link aggregation ports |
| VLAN_ID | Specify the VLAN for which the packet with the specified MAC address is received. | 1-4094 |
| EPS_ID | EPS protection group. | 1-2048 |
| REMOTE_VTEP_ID | Remote VTEP | 1-65535 |
| SMART_LINK_ID | Smart-Link Group | 1-16 |

## Command Mode

Global Configuration

## Default

None

## Usage

The static address entries which are added by this command are not aged.

## Examples

This example shows how to add the static address c2f3220a12f4 to the MAC address table When a packet is received in VLAN 4 with this MAC address as its destination, the packet is forwarded to the specified interface:

```
Switch# configure terminal
Switch(config)# mac-address-table c2f3.220a.12f4 forward eth-0-1 vlan 4
```

## Related Commands

show mac address-table

## 3.3.4 mac-address-table discard

### Command Purpose

Use the mac-address-table discard global configuration command on the switch to enable unicast MAC address filtering and to configure the switch to drop traffic with a specific source or destination MAC address. Use the no form of this command to return to the default setting.

### Command Syntax

*mac_address-table MAC_ADDR* discard

no *mac_address-table MAC_ADDR* discard

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MAC_ADDR | Source or Destination MAC address (unicast) to add to the address filtering table | - |

### Command Mode

Global Configuration

### Default

None

### Usage

Follow these guidelines when using this feature:

Multicast MAC addresses, broadcast MAC addresses, and router MAC addresses are not supported. Packets that are forwarded to the CPU are also not supported.

### Examples

This example shows how to enable unicast MAC address filtering and to configure the switch to drop packets that have a source or destination address of c2f3220a12f4 When a packet is received with this MAC address as its source or destination, the packet is dropped:

```
Switch# configure terminal
Switch(config)# mac-address-table c2f3.220a.12f4 discard
```

## Related Commands

mac-address-table forward

# 3.3.5 mac-address-table overwrite

## Command Purpose

Use this command to convert dynamic MAC entries to static entries.

## Command Syntax

mac-address-table dynamic-mac overwrite static （interface IFNAME | vlan VLAN_ID）

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| interface IFNAME | Interface name | Support physical/aggregation ports |
| vlan VLAN_ID | Vlan ID. | 1-4094 |

## Command Mode

Global Configuration

## Default

None

## Usage

After completing the dynamic MAC address learning, use this command to convert the dynamic entries into a static entries.

## Examples

This example shows how to convert all dynamic entries in the current MAC-ADDRESS-TABLE to static entries:

```
Switch# configure terminal
Switch(config)# mac-address-table dynamic-mac overwrite static
```

### Related Commands

show mac address-table

## 3.3.6 clear mac address-table

### Command Purpose

Use the clear mac address-table privileged EXEC command on the switch to delete all dynamic(or static, or multicast) addresses, or all dynamic(or static, or multicast) addresses on a particular interface, or all dynamic(or static, or multicast) addresses on a particular VLAN from the MAC address table.

### Command Syntax

clear mac address-table ( static | dynamic | multicast ) { address *MAC_ADDR* | interface *IFNAME* | vlan *VLAN_ID* }

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| dynamic | Delete the dynamic MAC address | - |
| static | Delete the static MAC address | - |
| multicast | Delete the multicast MAC address | - |
| address MAC_ADDR | Delete the specified MAC address | Mac address in HHHH.HHHH.HHHH format |
| interface IFNAME | Delete all MAC addresses on the specified physical port or link aggregation port | Support physical/aggregation ports |
| vlan VLAN_ID | Delete all MAC addresses for the specified VLAN. | 1-4094 |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to remove a specific MAC address from the dynamic address table:

```
Switch# clear mac address-table dynamic address 0008.0070.0007
```

### Related Commands

show mac address-table

## 3.3.7 port-bridge

### Command Purpose

Use this command to support to forward packets with the src-mac and dset-mac learned by the same port.

### Command Syntax

switchport port-bridge enable

no switchport port-bridge enable

### Command Mode

Interface Configuration

### Default

None

### Usage

None

### Examples

This example shows how to enable port-bridge function:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport port-bridge enable
```

### Related Commands

None

## 3.3.8 show mac address-table aging-time

### Command Purpose

Use the show mac address-table aging-time privileged EXEC command to display the aging time of all address table instances on all VLANs.

### Command Syntax

show mac address-table aging-time

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

## Examples

This is an example of output from the show mac address-table aging-time command:

```
Switch# show mac address-table aging-time
MAC address table aging time is 300 seconds
```

## Related Commands

mac-address-table aging-time

# 3.3.9 show mac address-table

## Command Purpose

Use the show mac address-table privileged EXEC command to display a specific MAC address table static and dynamic entry or the MAC address table static and dynamic entries on a specific interface or VLAN.

## Command Syntax

show mac address-table ( dynamic | static | multicast | ) ( address *MAC_ADDR* | interface *IFNAME* | vlan *VLAN_ID* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| dynamic | Display the dynamic MAC address | - |
| static | Display the static MAC address | - |
| multicast | Display the multicast MAC address | - |
| address MAC_ADDR | Display the specified MAC address | Mac address in HHHH.HHHH.HHHH format |
| interface IFNAME | Display all MAC addresses on the specified physical port or link aggregation port | Support physical/aggregation ports |
| vlan VLAN_ID | Display all MAC addresses for the specified VLAN. | 1-4094 |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This is an example of output from the show mac address-table command:

```
Switch# show mac address-table
          Mac Address Table
------------------------------------------
(*)  - Security Entry      (M)  - MLAG Entry
(MO) - MLAG Output Entry   (MI) - MLAG Input Entry
Vlan    Mac Address        Type         Ports
----    -----------        --------     -----
1       0000.0000.0001     static        eth-0-2
1       0000.0001.0003     static(*)    eth-0-1
1       0000.0001.0002     static(*)    eth-0-1
2       26fc.72e5.0100     dynamic(*)     eth-0-9
1       0100.0000.0001     static        eth-0-2
```

## Related Commands

mac-address-table

# 3.3.10 show mac address-table hardware

## Command Purpose

Use the show mac address-table hardware privileged EXEC command to display a specific MAC address table static and dynamic entry or the MAC address table static and dynamic entries on a specific interface or VLAN in hardware.

## Command Syntax

show mac address-table hardware ( dynamic | static | ) ( address *MAC_ADDR* | interface *IFNAME* | vlan *VLAN_ID* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| dynamic | Display the dynamic MAC address | - |
| static | Display the static MAC address | - |
| address MAC_ADDR | Display the specified MAC address | Mac address in HHHH.HHHH.HHHH format |
| interface IFNAME | Display all MAC addresses on the specified physical port or link aggregation port | Support physical/aggregation ports |
| vlan VLAN_ID | Display all MAC addresses for the specified VLAN. | 1-4094 |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This is an example of output from the show mac address-table hardware command:

```
Switch# show mac address-table hardware
          Mac Address Table
------------------------------------------
(*)  - Security Entry     (M)  - MLAG Entry
(MO) - MLAG Output Entry  (MI) - MLAG Input Entry
Vlan    Mac Address       Type        Ports
----    -----------       --------    -----
1       0000.0000.0001    static       eth-0-2
1       0000.0001.0003    static(*)   eth-0-1
1       0000.0001.0002    static(*)   eth-0-1
2       26fc.72e5.0100    dynamic(*)    eth-0-9
1       0100.0000.0001    static       eth-0-2
```

## Related Commands

mac-address-table

# 3.3.11 show mac address-table count

## Command Purpose

Use the show mac address-table count privileged EXEC command to display the number of addresses present in all VLANs.

## Command Syntax

show mac address-table count

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This is an example of output from the show mac address-table count command:

```
Switch# show mac address-table count
Dynamic Address Count  :    0    (Security: 0)
Static  Address Count  :    0    (Security: 0)
Blackhole Address Count:    1
Total Mac Addresses    :    1    (Security: 0)
```

## Related Commands

show mac address-table

## 3.3.12 show mac address-table hardware count

### Command Purpose

Use the show mac address-table count privileged EXEC command to display the number of addresses present in all VLANs in hardware.

### Command Syntax

show mac address-table hardware count

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This is an example of output from the show mac address-table hardware count command:

```
Switch# show mac address-table hardware count
MAC address count in hardware table:
(Include MAC security entry)
-----------------------------------------
Dynamic Address Count  :    0
Static  Address Count  :    0
Total Mac Addresses    :    0
```

### Related Commands

show mac address-table hardware

## 3.3.13 show mac address-table add-fdb-fail

### Command Purpose

Use the show mac address-table add-fdb-fail privileged EXEC command to display all failed static FDB entries when adding FDB table in chip for hash conflict.

### Command Syntax

show mac address-table add-fdb-fail

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This is an example of output from the show mac address-table add-fdb-fail command:

```
Switch# show mac address-table add-fdb-fail
Vlan    Mac Address       Type        Ports
----------------------------------------------------
1       0000.0000.0001    static      eth-0-1
1       0000.0000.0002    static      eth-0-2
```

### Related Commands

show mac address-table

## 3.3.14 show mac-filter address-table

### Command Purpose

Use the show mac-filter address-table privileged EXEC command to display the number of filter addresses present in all VLANs.

### Command Syntax

show mac-filter address-table

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This is an example of output from the show mac-filter address-table command:

```
Switch# show mac-filter address-table
     MAC Filter Address Table
---------------------------------
 Current count       : 0
 Max count           : 128
 Left count          : 128
 Filter address list :
---------------------------------
```

### Related Commands

show mac address-table

## 3.3.15 show resource mac-filter

### Command Purpose

Use this command to display the resource statistic used by mac-filter.

### Command Syntax

show resource mac-filter

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following is sample output from the show resource mac-filter command:

```
Switch# show resource mac-filter
MAC-FILTER
Resource                        Used          Capability
================================================================
Blackhole MAC Addresses         0             128
```

### Related Commands

show resource static-fdb

## 3.3.16 show resource static-fdb

### Command Purpose

Use this command to display the resource statistic used by static FDB.

### Command Syntax

show resource static-fdb

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following is sample output from the show resource static-fdb command:

```
Switch# show resource static-fdb
STATIC-FDB
Resource                          Used          Capability
=============================================================
Static FDB                        0             1024
```

### Related Commands

show resource mac-filter

## 3.4 VLAN Commands

### 3.4.1 vlan database

### Command Purpose

Use this command to enter VLAN configure mode.

### Command Syntax

vlan database

### Command Mode

Global Configuration

### Default

None

### Usage

When you try to create or remove VLAN, you must use this command to enter VLAN configure mode first. To exit VLAN configure mode, use exit command.

### Examples

This example shows how to enter VLAN configure mode:

```
Switch# configure terminal
Switch(config)# vlan database
Switch(config-vlan)#
```

This example shows how to exit VLAN configure mode:

```
Switch# configure terminal
Switch(config)# vlan database
Switch(config-vlan)# exit
Switch(config)#
```

### Related Commands

exit

## 3.4.2 vlan

### Command Purpose

Use the vlan VLAN configuration command to configure VLAN characteristics for a VLAN in the VLAN database. Use the no form of this command to delete a VLAN.

### Command Syntax

vlan *VLAN_ID* ( name *NAME* | ) ( state ( enable | disable ) | )

no vlan *VLAN_ID*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan id | 1-4094 |
| NAME | the name for specific vlan, | A string with no more than 128 characters |
| enable | set the operational state of the VLAN to enable, and it is enabled by default | - |
| disable | set the operational state of the VLAN to disable | - |

## Command Mode

VLAN Configuration

## Default

VLAN 1 is the default VLAN and all ports have been added to it by default.

## Usage

Default VLAN 1 can not be removed.

## Examples

This example shows how to create VLAN 11 and named it to “vlan11”:

```
Switch# configure terminal
Switch(config)# vlan database
Switch(config-vlan)# vlan 11 name vlan11 state enable
```

This example shows how to remove VLAN 11:

```
Switch# configure terminal
Switch(config)# vlan database
Switch(config-vlan)# no vlan 11
```

## Related Commands

vlan VLAN_LIST

show vlan vlan

show vlan all

## 3.4.3 vlan VLAN_LIST

### Command Purpose

Use the vlan VLAN_LIST configuration command to add a normal-range VLANs to the VLAN database.

### Command Syntax

vlan *VLAN_LIST*

no vlan *VLAN_LIST*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_LIST | vlan list | vlan list connected with '-' and ',', for example, "1-10,15,20,30-40" |

### Command Mode

VLAN Configuration

### Default

Vlan 1 is the default vlan and all ports have been added to it by default.

### Usage

The vlan list should be connected with '-' and ',', the value should be in the range of <1-4094> and should be ascending order.

Default VLAN 1 can not be removed.

### Examples

This example shows how to add vlans of "100,200,300-400":

```
Switch# configure terminal
Switch(config)# vlan database
Switch(config-vlan)# vlan 100,200,300-400
```

This example shows how to remove vlans of "100,200,300-400":

```
Switch# configure terminal
Switch(config)# vlan database
Switch(config-vlan)# no vlan 100,200,300-400
```

### Related Commands

vlan <1-4094>

show vlan vlan

show vlan all

## 3.4.4 show vlan

### Command Purpose

Use this command to display specific vlan information.

### Command Syntax

show vlan *VLAN_ID*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan id | 1-4094 |

### Command Mode

Privileged EXEC

### Default

None

### Usage

This command is used to display VLAN property including name, state, stp id, DSCP, member ports.

### Examples

This example shows how to display the information on VLAN 11:

```
Switch# show vlan 11
VLAN ID  Name                             State   STP ID  Member ports

                                                          (u)-Untagged, (t)-Tagged
======= ================================ ======= ======= ========================
11      VLAN0011                         ACTIVE  0       eth-0-3(u) eth-0-4(t)
```

### Related Commands

show vlan all

## 3.4.5 show vlan all

### Command Purpose

Use this command to show the information of all the VLAN.

### Command Syntax

show vlan all

### Command Mode

Privileged EXEC

### Default

None

### Usage

This command is used to display all VLAN property including name, state, stp id, DSCP, member ports.

### Examples

This example shows how to display the information on VLAN all:

```
Switch# show vlan all
VLAN ID  Name                             State   STP ID  Member ports

                                                          (u)-Untagged, (t)-Tagged
======= ================================ ======= ======= ========================
```

```
1       default                          ACTIVE  0       eth-0-1(u) eth-0-2(u)
                                                         eth-0-4(t) eth-0-5(u)
11      VLAN0011                         ACTIVE  0       eth-0-3(u) eth-0-4(t)
```

### Related Commands

show vlan vlan

## 3.4.6 show vlan brief

### Command Purpose

Use this command to show the brief information on VLAN.

### Command Syntax

show vlan brief

### Command Mode

Privileged EXEC

### Default

None

### Usage

This command is used to display all VLAN information for all bridges, including static and dynamic.

### Examples

This example shows how to display the brief information on VLAN:

```
Switch# show vlan brief
VLAN ID  Name                             State   STP ID  Member ports
                                                         (u)-Untagged, (t)-Tagged
======= ================================ ======= ======= ========================
1       default                          ACTIVE  0       eth-0-1(u) eth-0-2(u)
                                                         eth-0-4(u) eth-0-5(u)
10      VLAN0010                         ACTIVE  0       eth-0-3(u)
```

### Related Commands

show vlan vlan

## 3.4.7 show interface switchport

### Command Purpose

Use this command to show the vlan configurations on all bridge ports or a bridge port.

### Command Syntax

show interface switchport { interface *IFNAME* | }

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | Interface name | Support aggregation and physical ports |

### Command Mode

Privileged EXEC

### Default

None

### Usage

This command is used to display one or all VLAN's L2 configurations.

### Examples

This example shows how to display the vlan configurations on all bridge ports or a bridge port:

```
Switch# show interface switchport interface eth-0-1
 Interface name          : eth-0-1
 Switchport mode         : access
 Ingress filter          : enable
 Acceptable frame types  : vlan-untagged only
 Default Vlan            : 1
```

```
Configured Vlans        : 1

Interface name          : eth-0-2
Switchport mode         : access
Ingress filter          : enable
Acceptable frame types  : vlan-untagged only
Default Vlan            : 1
Configured Vlans        : 1
```

### Related Commands

switchport mode access

switchport mode trunk

## 3.4.8 switchport access allowed

### Command Purpose

Use this command to allow or remove the access port to the specifid vlan

### Command Syntax

switchport access allowed vlan ( add | remove ) *VLAN_ID_LIST*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| add | add the port to the specified vlan | - |
| remove | remove the port from the specified vlan | - |
| VLAN_ID_LIST | vlan list | Connected with '-' and ',', for example, "1-10,15,20,30-40" |

### Command Mode

Interface Configuration

### Default

None

## Usage

This command used to allow or forbid the port transmit in specified vlan.

## Examples

This example shows how to add the access port to vlan11:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# switchport access allowed vlan add 11
```

This example shows how to remove the access port to vlan12:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# switchport access allowed vlan remove 12
```

## Related Commands

switchport trunk allowed

# 3.4.9 switchport access vlan

## Command Purpose

Use this command to add port to a specified.Use the no form of this command to add port to vlan1.

## Command Syntax

switchport access vlan *VLAN_ID*

no switchport access vlan

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan id | 2-4094 |

## Command Mode

Interface Configuration

### Default

All ports are default in vlan 1

### Usage

Used the switchport mode access command to switch the port to access mode before use this command.

### Examples

This example shows how to add the access port to vlan11:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# switchport access vlan 11
```

This example shows how to revert the port to vlan1:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport access vlan
```

### Related Commands

switchport mode access

## 3.4.10 switchport mode access

### Command Purpose

Use this command to swith port to access mode.

### Command Syntax

switchport mode access

### Command Mode

Interface Configuration

### Default

None

### Usage

Access mode used to connect terminal, e.g:PC.The FDB on the port will be cleared when switch the port mode.

### Examples

This example shows how to set the port to access mode:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# switchport mode access
```

### Related Commands

switchport mode trunk

## 3.4.11 switchport mode trunk

### Command Purpose

Use this command to swith port to trunk mode.

### Command Syntax

switchport mode trunk

### Command Mode

Interface Configuration

### Default

None

### Usage

Trunk mode used to connect swith device or terminal.The FDB on the port will be cleared when switch the port mode.

### Examples

This example shows how to set the port to trunk mode:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# switchport mode trunk
```

### Related Commands

switchport mode access

## 3.4.12 switchport trunk allowed

### Command Purpose

Use this command to allow or remove the trunk port to the specifid vlan

### Command Syntax

switchport trunk allowed vlan ( add *VLAN_ID_LIST* / *remove VLAN_ID_LIST* | all | none )

no switchport trunk

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID_LIST | vlan list | Connected with '-' and ',', for example, "1-10,15,20,30-40" |
| add | add the port to the specified vlan | - |
| remove | remove the port from the specified vlan | - |
| all | add the port to all vlans | - |
| none | remove the port from all vlans | - |

## Command Mode

Interface Configuration

## Default

None

## Usage

This command used to allow or forbid the port transmit in specified vlan.

## Examples

This example shows how to add the port in vlan11,12:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# switchport trunk allowed vlan add 11,12
```

This example shows how to remove the port from vlan11,12:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# switchport trunk allowed vlan remove 11,12
```

This example shows how to allow the port transmit in all vlan:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# switchport trunk allowed vlan all
```

This example shows how to forbid the port transmit in all vlan:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# switchport trunk allowed vlan none
```

## Related Commands

switchport access allowed

## 3.4.13 switchport trunk native

### Command Purpose

Use this command to configure the default VLAN for this trunk port.

### Command Syntax

switchport trunk native vlan *VLAN_ID*

no switchport trunk native vlan

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | An existing Vlan id | 2-4094 |

### Command Mode

Interface Configuration

### Default

vlan 1

### Usage

This command is used to set the native VLAN for sending and receiving untagged traffic.

### Examples

This example shows how to set the native vlan to vlan 10 on the interface:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# switchport trunk native vlan 10
```

This example shows how to return the native vlan to default on the interface:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport trunk native vlan
```

## Related Commands

switchport trunk allowed

# 3.4.14 switchport trunk unatgged vlan

## Command Purpose

Use this command to strip the packets vlan tag out of this port.

## Command Syntax

switchport trunk untagged vlan *VLAN_ID_LIST*

no switchport trunk untagged vlan *VLAN_ID_LIST*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID_LIST | vlan list | Connected with '-' and ',', for example, "1-10,15,20,30-40" |

## Command Mode

Interface Configuration

## Default

None

## Usage

None

## Examples

This example shows how to allocate the needing strip vlan tag on the interface.:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# switchport trunk untagged vlan 1-2
```

### Related Commands

None

## 3.4.15 vlan bridge disable

### Command Purpose

Use this command to disable bridge function on specific VLAN. To enable it, use the no form of this command.

### Command Syntax

vlan *VLAN_ID* bridge disable

no vlan vlan bridge disable

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan id | 1-4094 |

### Command Mode

VLAN Configuration

### Default

Vlan bridge enable

### Usage

None

### Examples

This example shows how to disable bridge function on VLAN 2:

```
Switch# configure terminal
Switch(config)# vlan database
Switch(config-vlan)# vlan 10 bridge disable
```

This example shows how to enable bridge function on VLAN 2:

```
Switch# configure terminal
Switch(config)# vlan database
Switch(config-vlan)# no vlan 10 bridge disable
```

### Related Commands

None

## 3.4.16 vlan statistics enable

### Command Purpose

Use this command to enable the statistics of VLAN.

To disable the statistics, use the no form of this command.

### Command Syntax

vlan *VLAN_ID* statistics enable

no vlan *VLAN_ID* statistics enable

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | An existing Vlan id | 1-4094 |

### Command Mode

VLAN Configuration

### Default

inactive

### Usage

none

### Examples

This example shows how to enable the statistics of vlan 2:

```
Switch# configure terminal
Switch(config)# vlan database
Switch(config-vlan)# vlan 2 statistics enable
```

This example shows how to disable the statistics of vlan 2:

```
Switch# configure terminal
Switch(config)# vlan database
Switch(config-vlan)#no vlan 2 statistics enable
```

### Related Commands

vlan statistics interval

clear vlan statistics

show vlan vlan statistics

## 3.4.17 vlan statistics interval

### Command Purpose

Use this command to set sample interval.

To restore to default value, use the no form of this command.

### Command Syntax

vlan statistics interval *VALUE*

no vlan statistics intval

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VALUE | Sample interval | 5-600, unit:second |

### Command Mode

VLAN Configuration

### Default

10s

### Usage

none

### Examples

This example shows how to set sample interval:

```
Switch# configure terminal
Switch(config)# vlan database
Switch(config-vlan)# vlan statistics interval 20
```

### Related Commands

vlan statistics enable

clear vlan statistics

show vlan vlan statistics

## 3.4.18 clear vlan statistics

### Command Purpose

Use this command to clear statistics information.

### Command Syntax

clear vlan *VLAN_ID* statistics

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | An existing Vlan id | 1-4094 |

### Command Mode

Privileged EXEC

### Default

none

### Usage

none

### Examples

This example shows how to clear vlan statistics:

```
Switch# clear vlan 2 statistics
```

### Related Commands

vlan statistics enable

vlan statistics interval

show vlan vlan statistics

## 3.4.19 show vlan statistics

### Command Purpose

Use this command to show statistics information.

### Command Syntax

show vlan *VLAN_ID* statistics

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | An existing Vlan id | 1-4094 |

### Command Mode

Privileged EXEC

### Default

none

### Usage

none

### Examples

This example shows how to show vlan statistics:

```
Switch# show vlan all statistics
 ------------------------------------------------------------------------------
VLANID  InPkts           OutPkts          InBytes            OutBytes
------------------------------------------------------------------------------
2       0                0                0                  0
```

### Related Commands

vlan statistics enable

vlan statistics interval

## 3.4.20 show resource vlan-stats

### Command Purpose

Use this command to show the resource statistic used by vlan statistics.

### Command Syntax

show resource vlan-stats

### Command Mode

Privileged EXEC

### Default

none

### Usage

none

### Examples

This example shows how to show resource used by vlan statistics:

```
Switch# show resource vlan-stats
VLAN-STATS
Resource                          Used          Capability
============================================================
Applied VLAN Stats Entry          1             128
```

### Related Commands

vlan statistics enable

## 3.5 Voice VLAN Commands

### 3.5.1 voice vlan

#### Command Purpose

Use this command to specific VLAN as VOICE VLAN.

#### Command Syntax

voice vlan *VLAN_ID*

no voice vlan

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan id | 2-4094 |

#### Command Mode

Global Configuration

#### Default

Voice VLAN is disable

#### Usage

This command is enabled VOICE VLAN.

#### Examples

This example shows how to enable VLAN 2 as VOICE VLAN:

```
Switch# configure terminal
Switch(config)# voice vlan 2
```

### Related Commands

None

## 3.5.2 voice vlan security enable

### Command Purpose

Use this command to enable VOICE VLAN security.

### Command Syntax

voice vlan security enable

no voice vlan security enable

### Command Mode

Global Configuration

### Default

By default the mode is security.

### Usage

If the security is enabled, all the packet that whose MAC is mismatched with OUI will be dropped in VOICE VLAN.

### Examples

This example shows how to enable security:

```
Switch# configure terminal
Switch(config)# voice vlan security enable
```

### Related Commands

show voice vlan state

## 3.5.3 voice vlan set cos to

### Command Purpose

Use this command to set COS for VOICE packet.

### Command Syntax

voice vlan set cos to *COS*

no voice vlan set cos

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| COS | cos value | 0-7 |

### Command Mode

Global Configuration

### Default

By default the phb is 5

### Usage

This command is used to set COS for VOICE packet in global configuration.

### Examples

This example shows how to set cos to 7:

```
Switch# configure terminal
Switch(config)# voice vlan set cos to 7
```

### Related Commands

show voice vlan state

## 3.5.4 voice vlan mac-address

### Command Purpose

Use this command to add OUI to system.

### Command Syntax

voice vlan mac-address *MAC MASK* description *LINE*

no voice vlan mac-address *MAC*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MAC | Source MAC address (unicast or multicast) to add to the address table | MAC Address in HHHH.HHHH.HHHH format |
| MASK | The MASK for the Source MAC | MAC Mask in HHHH.HHHH.HHHH format |
| LINE | The description for this OUI | Up to 63 characters |

### Command Mode

Global Configuration

### Default

There are 5 default OUI in the system.:

0003-6b00-0000 Cisco phone

000f-e200-0000 H3C Aolynk phone

00d0-1e00-0000 Pingtel phone

00e0-7500-0000 Polycom phone

00e0-bb00-0000 3Com phone

### Usage

This command is used to add OUI to system database. The packet will be considered as VOICE VLAN packet when the source MAC match the OUI.

### Examples

This example shows how to add OUI to system:

```
Switch# configure terminal
Switch(config)# voice vlan mac-address 0034.3400.0000 FFFF.FF00.0000 description
test
```

### Related Commands

show voice vlan state

## 3.5.5 voice vlan enable

### Command Purpose

Use this command to enable VOICE VLAN on port.

### Command Syntax

voice vlan enable

no voice vlan enable

### Command Mode

Interface Configuration

### Default

VOICE VLAN is disable on port

### Usage

This command is used to enable VOICE VLAN on port.

### Examples

This example shows how to enable VOICE VLAN on port:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# voice vlan enable
```

### Related Commands

show voice vlan state

## 3.5.6 show voice vlan state

### Command Purpose

Use this command to show the current status of VOICEC VLAN.

### Command Syntax

show voice vlan state

### Command Mode

Privileged EXEC

### Default

None

### Usage

This command is used to show the current status of VOICEC VLAN.

### Examples

This example shows how to show the current status of VOICEC VLAN:

```
Switch# show voice vlan state
```

### Related Commands

voice vlan enable

# 3.6 Link Aggregation Commands

## 3.6.1 channel-group

### Command Purpose

Use this command to assign a port to a channel group. Use the no form of this command to remove a port from a channel group.

### Command Syntax

channel-group *GROUP_NUMBER* mode ( active | passive )

no channel-group

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| GROUP_NUMBER | Channel group number | 1-63 |
| active | Enable initiation of LACP negotiation on a port | - |
| passive | Disable initiation of LACP negotiation on a port | - |

### Command Mode

Interface Configuration

### Default

None

### Usage

None

### Examples

This example shows how to assign a port to a channel group 1:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# channel-group 1 mode active
```

This example shows how to remove a port from an channel group 1:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no channel-group
```

### Related Commands

None

## 3.6.2 static-channel-group

### Command Purpose

Use this command to assign a port to a static channel group. Use the no form of this command to remove a port from a static channel group.

### Command Syntax

static-channel-group *GROUP_NUMBER*

no static-channel-group

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| GROUP_NUMBER | Channel group number | 0-63 |

### Command Mode

Interface Configuration

### Default

None

### Usage

None

### Examples

This example shows how to assign a port to a static channel group 1:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# static-channel-group 1
```

This example shows how to remove a port from a static channel group 1:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no static-channel-group
```

## Related Commands

None

# 3.6.3 distribute-weight

## Command Purpose

Use this command to configure the distribute-weight of member for the static channel group or the Link Aggregation Control Protocol (LACP). Use the no form of this command to return to the default setting.

## Command Syntax

distribute-weight *WEIGHT*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| WEIGHT | Distribute-weight | 1-256 |

## Command Mode

Interface Configuration

## Default

1

## Usage

Distribute-weight is only supported in non-selfing-healing of static load-balance-mode member port, and the total weights of member ports cannot exceed the maximum number of member ports.

## Examples

This example shows how to configure the distribute-weight 10 for member:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# static-channel-group 1
Switch(config-if)# distribute-weight 10
```

This example shows how to return to the default setting:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# static-channel-group 1
Switch(config-if)# no distribute-weight
```

## Related Commands

None

# 3.6.4 lacp max-active-linknumber

## Command Purpose

Use this command to configure the aggregator max active link number for the Link Aggregation Control Protocol (LACP). Use the no form of this command to return to the default setting.

## Command Syntax

lacp max-active-linknumber *NUMBER*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NUMBER | Max-active-linknumber | 1-255 |

## Command Mode

Interface Configuration

## Default

255

## Usage

Max-active-linknum is only supported in the aggregator of Link Aggregation Control Protocol (LACP)

## Examples

This example shows how to configure the max-active-linknumber 100 for the Link Aggregation Control Protocol (LACP) aggregator:

```
Switch# configure terminal
Switch(config)# interface agg1
Switch(config-if)# lacp max-active-linknumber 100
```

This example shows how to return to the default setting:

```
Switch# configure terminal
Switch(config)# interface agg1
Switch(config-if)# no lacp max-active-linknumber
```

## Related Commands

None

# 3.6.5 lacp preempt enable

## Command Purpose

Use this command to enable the aggregator of Aggregation Control Protocol (LACP) preemption. Use the no form of this command to return to the default setting.

## Command Syntax

lacp preempt enable

no lacp preempt enable

## Command Mode

Interface Configuration

## Default

Disabled

## Usage

lacp preempt enable is only supported in the aggregator of Link Aggregation Control Protocol (LACP)

## Examples

This example shows how to enable preempt for the Link Aggregation Control Protocol (LACP) aggregator:

```
Switch# configure terminal
Switch(config)# interface agg1
Switch(config-if)# lacp preempt enable
```

This example shows how to return to the default setting:

```
Switch# configure terminal
Switch(config)# interface agg1
Switch(config-if)# no lacp preempt enable
```

## Related Commands

None

# 3.6.6 lacp preempt delay

## Command Purpose

Use this command to config the aggregator of Aggregation Control Protocol (LACP) preempt delay. Use the no form of this command to return to the default setting.

## Command Syntax

lacp preempt delay *TIME*

no lacp preempt delay

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| TIME | preempt delay time | 0-180 |

### Command Mode

Interface Configuration

### Default

30

### Usage

lacp preempt delay is only supported in the aggregator of Link Aggregation Control Protocol (LACP), and take effect when preempt is enabled

### Examples

This example shows how to configure lacp preempt delay 100 for the Link Aggregation Control Protocol (LACP) aggregator:

```
Switch# configure terminal
Switch(config)# interface agg1
Switch(config-if)# lacp preempt delay 100
```

This example shows how to return to the default setting:

```
Switch# configure terminal
Switch(config)# interface agg1
Switch(config-if)# no lacp preempt delay
```

### Related Commands

None

## 3.6.7 lacp port-id extend

### Command Purpose

Use this command to configure the extension of LACP port numbers, and use the no form of this command to restore the default port priority value.

### Command Syntax

lacp port-id extend *Value*

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| VALUE | Extend value | 1-2 |

## Command Mode

Interface Configuration

## Default

none

## Usage

none

## Examples

The following example shows how to set the port extension value of the agg1 to 1:

```
Switch# configure terminal
Switch(config)# interface agg1
Switch(config-if)# lacp port-id extend 1
```

The following example shows how to restore the extended value of the agg1 to its default value

```
Switch# configure terminal
Switch(config)# interface agg1
Switch(config-if)# no lacp port-id extend
```

## Related Commands

none

# 3.6.8 lacp port-priority

## Command Purpose

Use this command to configure the port priority for the Link Aggregation Control Protocol (LACP). Use the no form of this command to return to the default setting.

## Command Syntax

lacp port-priority *PRIORITY*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PRIORITY | LACP port priority | 1-65535 |

## Command Mode

Interface Configuration

## Default

32768

## Usage

None

## Examples

This example shows how to configure the port priority 100 for the Link Aggregation Control Protocol (LACP) member:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# lacp port-priority 100
```

This example shows how to return to the default setting:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no lacp port-priority
```

## Related Commands

None

## 3.6.9 lacp timeout

### Command Purpose

Use this command to configure the port timeout for the Link Aggregation Control Protocol (LACP). Use the no form of this command to return to the default setting.

### Command Syntax

lacp timeout ( short | long )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| short | Set LACP short timeout | - |
| long | Set LACP long timeout | - |

### Command Mode

Interface Configuration

### Default

Long

### Usage

None

### Examples

This example shows how to configure the port timeout short for the Link Aggregation Control Protocol (LACP):

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# lacp timeout short
```

This example shows how to return to the default setting:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no lacp timeout
```

## Related Commands

None

# 3.6.10 lacp system-priority

## Command Purpose

Use this command to configure the system priority for the Link Aggregation Control Protocol (LACP). Use the no form of this command to return to the default setting.

## Command Syntax

lacp system-priority *PRIORITY*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PRIORITY | LACP system priority | 1-65535 |

## Command Mode

Global Configuration

## Default

32768

## Usage

None

## Examples

This example shows how to configure the system priority 100 for the Link Aggregation Control Protocol (LACP):

```
Switch# configure terminal
Switch(config)# lacp system-priority 100
```

This example shows how to return to the default setting:

```
Switch# configure terminal
Switch(config)# no lacp system-priority
```

## Related Commands

None

# 3.6.11 lacp mlag system-id

## Command Purpose

Use this command to configure the mlag system id for the Link Aggregation Control Protocol (LACP). Use the no form of this command to return to the default setting.

## Command Syntax

lacp mlag system-id *MAC*

no lacp mlag system-id

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MAC | LACP mlag system id | Mac address in HHHH.HHHH.HHHH format |

## Command Mode

Global Configuration

## Default

system route-mac

## Usage

None

## Examples

This example shows how to configure the mlag system id 1111.1111.1111 for the Link Aggregation Control Protocol (LACP):

```
Switch# configure terminal
Switch(config)# lacp mlag system-id 1111.1111.1111
```

This example shows how to return to the default setting:

```
Switch# configure terminal
Switch(config)# no lacp mlag system-id
```

### Related Commands

None

## 3.6.12 port-channel channel-group-number load-balance-mode dynamic

### Command Purpose

Use this command to enable dynamic load balance for the Link Aggregation Group (both static and dynamic aggregator). Use the no form of this command to return to the default setting.

### Command Syntax

port-channel *GROUP_NUMBER* load-balance-mode dynamic ( flow-number *FLOW_NUMBER* | )

no port-channel *GROUP_NUMBER* load-balance-mode

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| GROUP_NUMBER | Channel group number | 0-63 |
| FLOW_NUMBER | Flow Number, default value is 32, can be 32/64/128/256/512/1024/2048 | - |

### Command Mode

Global Configuration

### Default

None

## Usage

Before enable or disable the load-balance mode, the Link Aggregation Group should not be create.

## Examples

This example shows how to enable dynamic load balance for agg1:

```
Switch# configure terminal
Switch(config)# port-channel 1 load-balance-mode dynamic
```

## Related Commands

None

# 3.6.13 port-channel channel-group-number load-balance-mode resilient

## Command Purpose

Use this command to enable resilient load balance for the Link Aggregation Group(both static and dynamic aggregator). Use the no form of this command to return to the default setting.

## Command Syntax

port-channel *GROUP_NUMBER* load-balance-mode resilient ( flow-number *FLOW_NUMBER* | )

no port-channel channel-group-number load-balance-mode

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| GROUP_NUMBER | Channel group number | 0-63 |
| FLOW_NUMBER | Flow Number, default value is 32, can be 32/64/128/256 | - |

## Command Mode

Global Configuration

### Default

None

### Usage

Before enable or disable the load-balance mode, the Link Aggregation Group should not be create.

### Examples

This example shows how to enable resilient load balance for agg1:

```
Switch# configure terminal
Switch(config)# port-channel 1 load-balance-mode resilient
```

### Related Commands

None

## 3.6.14 port-channel channel-group-number load-balance-mode round-robin

### Command Purpose

Use this command to enable round-robin load balance for the Link Aggregation Group(both static and dynamic aggregator). Use the no form of this command to return to the default setting.

### Command Syntax

port-channel *GROUP_NUMBER* load-balance-mode round-robin ( flow-number *FLOW_NUMBER* | )

no port-channel *GROUP_NUMBER* load-balance-mode

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| GROUP_NUMBER | Channel group number | 0-63 |
| FLOW_NUMBER | Flow Number, default value is 24 | - |

## Command Mode

Global Configuration

## Default

None

## Usage

Before enable or disable the load-balance mode, the Link Aggregation Group should not be create.

## Examples

This example shows how to enable round-robin load balance for agg1:

```
Switch# configure terminal
Switch(config)# port-channel 1 load-balance-mode round-robin
```

## Related Commands

None

# 3.6.15 port-channel channel-group-number self-healing

## Command Purpose

Use this command to enable self-healing for the Link Aggregation Group(both static and dynamic aggregator). Use the no form of this command to return to the default setting.

## Command Syntax

port-channel *GROUP_NUMBER* self-healing

no port-channel *GROUP_NUMBER* self-healing

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| GROUP_NUMBER | Channel group number | 0-63 |

## Command Mode

Global Configuration

## Default

None

## Usage

Before enable or disable the self-healing, the Link Aggregation Group should not be create.

## Examples

This example shows how to enable self-healing for agg1:

```
Switch# configure terminal
Switch(config)# port-channel 1 self-healing
```

## Related Commands

None

# 3.6.16 port-channel channel-group-number static

## Command Purpose

Use this command to enable static load balance for the Link Aggregation Group (both static and dynamic aggregator). Use the no form of this command to return to the default setting.

## Command Syntax

port-channel *GROUP_NUMBER* load-balance-mode static ( flow-number *FLOW_NUMBER* | )

no port-channel *GROUP_NUMBER* load-balance-mode

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| GROUP_NUMBER | Channel group number | 0-63 |

| | | |
|---|---|---|
| FLOW_NUMBER | Flow Number, default value is 16, can be 1~24/32/64/128 | - |

## Command Mode

Global Configuration

## Default

None

## Usage

Before enable or disable the load-balance mode, the Link Aggregation Group should not be create.

## Examples

This example shows how to enable static load balance for agg1:

```
Switch# configure terminal
Switch(config)# port-channel 1 load-balance-mode static
```

## Related Commands

None

# 3.6.17 port-channel channel-group-number lacp-mode dynamic

## Command Purpose

Use this command to enable dynamic lacp for the Link Aggregation Group (only dynamic aggregator). Use the no form of this command to unset the setting.

## Command Syntax

port-channel *GROUP_NUMBER* lacp-mode dynamic

no port-channel *GROUP_NUMBER* lacp-mode

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| GROUP_NUMBER | Channel group number | 0-63 |

## Command Mode

Global Configuration

## Default

None

## Usage

Before enable or disable the dynamic lacp mode, the Link Aggregation Group should not be create.

## Examples

This example shows how to enable dynamic lacp-mode for agg1:

```
Switch# configure terminal
Switch(config)# port-channel 1 lacp-mode dynamic
```

## Related Commands

None

# 3.6.18 port-channel group-mode

## Command Purpose

Use this command to switch the Link Aggregation Group mode. Use the no form of this command to return to the default group mode(56). Lacp cannot use ID 0.

## Command Syntax

port-channel group-mode ( flexible | 8 | 16 | 32 | 56 )

no port-channel group-mode

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| flexible | Group mode flexible, the group range is 0~63 | - |
| 8 | Group mode 8, the group range is 0~7 | 8 |
| 16 | Group mode 16, the group range is 0~15 | 16 |
| 32 | Group mode 32, the group range is 0~31 | 32 |
| 56 | Group mode 32, the group range is 0~55 | 56 |

## Command Mode

Global Configuration

## Default

flexible

## Usage

The linkagg group-mode you specified will not take effect until you save configuration and reboot

## Examples

This example shows how to switch to group mode 32:

```
Switch# configure terminal
Switch(config)# port-channel group-mode 32
```

## Related Commands

None

# 3.6.19 show channel-group summary

## Command Purpose

Use this command to display a summary of all of the channel groups, or a specified channel group.

## Command Syntax

show channel-group ( channel-group-number | ) summary

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| channel-group-number | Channel group number | 0-63 |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to display a summary of all of the channel groups:

```
Switch# show channel-group summary
port-channel load-balance hash-arithmetic: xor
port-channel load-balance hash-field-select:
        ipsa ipda srcport dstport ip-protocol
port-channel group-mode: flexible

Flags:  s - Suspend           T - Standby
        D - Down/Admin down   B - In bundle
        R - Layer3            S - Layer2
        w - Wait              U - In use

Mode:   SLB  - Static load balance
        DLB  - Dynamic load balance
        RR   - Round robin load balance

        RLB  - Resilient load balance
Aggregator Name  Mode      Protocol     Ports
---------------+---------+------------+----------------------------------------
-------
agg4(SD)         SLB       Static       eth-0-10(D)
```

## Related Commands

None

# 3.6.20 show channel-group detail

## Command Purpose

Use this command to display detailed information of all of the channel groups, or a specified channel group.

## Command Syntax

show channel-group ( *GROUP_NUMBER* | ) detail

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| GROUP_NUMBER | Channel group number | 0-63 |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to display detailed information of the channel group 10:

```
Switch# show channel-group detail
                Channel-group listing:
                ----------------------


Group: 4
----------
Group state: L2
Ports: 1   Maxports: 16
Number of ports in bundle: 0 Max Channel-groups: 63
Protocol:   Static
                Ports in the group:
                -------------------

Port: eth-0-10
```

```
------------

Port state    : down Not-in-Bndl
Channel group : 4           Protocol : Static          Port-channel  : agg4
Port index    : 10
```

## Related Commands

None

# 3.6.21 show lacp internal

## Command Purpose

Use this command to display internal information of all of the channel groups, or a specified channel group.

## Command Syntax

show lacp ( *GROUP_NUMBER* | ) internal

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| GROUP_NUMBER | Channel group number | 0-63 |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to display internal information of all of the channel groups:

```
Switch# show lacp internal
Flags:  S - Device is requesting Slow LACPDUs
        F - Device is requesting Fast LACPDUs
```

```
       A - Device is in Active mode       P - Device is in Passive mode

Channel group 1
                           LACP port Admin   Oper    Port     Port
Port        Flags  State     Priority  key     Key     Number   State
eth-0-9     SA     bndl      32768     1       1       0x9      0x3d
```

## Related Commands

None

# 3.6.22 show lacp internal detail

## Command Purpose

Use this command to display detailed internal information of all of the channel groups, or a specified channel group.

## Command Syntax

show lacp ( *GROUP_NUMBER* | ) internal detail

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| GROUP_NUMBER | Channel group number | 0-63 |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to display detailed internal information of all of the channel groups:

```
Switch# show lacp internal detail
Flags:  S - Device is requesting Slow LACPDUs
        F - Device is requesting Fast LACPDUs
        A - Device is in Active mode       P - Device is in Passive mode
Channel group 1
Actor's information:

          Actor                  Actor        Actor
Port      System ID              Port Number  Flags
eth-0-9   32768,e0ef.1a32.7e00   0x9          SA

          LACP Actor         Actor         Actor
          Port Priority      Oper Key      Port State
          32768              1             0x4d

          Port State Flags Decode:
          Activity:   Timeout:   Aggregation:   Synchronization:
          Active      Long       Yes             Yes

          Collecting:   Distributing:   Defaulted:   Expired:
          No            No              Yes         No
```

## Related Commands

None

# 3.6.23 show lacp neighbor

## Command Purpose

Use this command to display neighbor information of all of the channel groups, or a specified channel group.

## Command Syntax

show lacp ( *GROUP_NUMBER* | ) neighbor

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| channel-group-numberGROUP_NUMBER | Channel group number | 0-63 |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to display neighbor information of all of the channel groups:

```
Switch# show lacp neighbor
Flags:  S - Device is requesting Slow LACPDUs
        F - Device is requesting Fast LACPDUs
        A - Device is in Active mode       P - Device is in Passive mode

Channel group 1 neighbors

Partner's information:

                LACP port                       Admin   Oper    Port      Port
Port      Flags  Priority   Dev ID               key     Key     Number    State
eth-0-9   FP     0          0000.0000.0000       0       0       0x0       0x46
```

## Related Commands

None

# 3.6.24 show lacp neighbor detail

## Command Purpose

Use this command to display detailed neighbor information of all of the channel groups, or a specified channel group.

## Command Syntax

show lacp ( *GROUP_NUMBER* | ) neighbor detail

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| GROUP_NUMBER | Channel group number | 0-63 |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to display detailed neighbor information of all of the channel groups:

```
Switch# show lacp neighbor detail
Flags:  S - Device is requesting Slow LACPDUs
        F - Device is requesting Fast LACPDUs
        A - Device is in Active mode       P - Device is in Passive mode
Channel group 1 neighbors
Partner's information:

          Partner                 Partner         Partner
Port      System ID               Port Number     Flags
eth-0-9   32768,0000.0000.0000    0x0             SP

          LACP Partner         Partner         Partner
          Port Priority        Oper Key        Port State
          0                    0               0x44

          Port State Flags Decode:
          Activity:   Timeout:   Aggregation:   Synchronization:
          Passive     Long       Yes             No

          Collecting:   Distributing:   Defaulted:   Expired:
          No            No              Yes          No
```

## Related Commands

None

# 3.6.25 show channel-group port

## Command Purpose

Use this command to display details of the LACP port of all of the channel groups, or a specified channel group, or a specified port.

## Command Syntax

show channel-group port ( *IFNAME* | )

show channel-group *GROUP_NUMBER* port

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | Interface name | Support physical ports |
| GROUP_NUMBER | Channel group number | 0-63 |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to display details of the LACP port of all of the channel group:

```
Switch# show channel-group port
                Channel-group listing:
                ----------------------

Group: 1
----------
                Ports in the group:
                -------------------
```

```
Port: eth-0-9
------------

Port state     : Up Sngl-port-Bndl Not-in-Bndl
Channel number : 1           Protocol : LACP          Channel-group  : agg1
Port index     : 9           Mode     : Active

Flags:  S - Device is sending Slow LACPDUs  F - Device is sending fast LACPDUs
        A - Device is in active mode        P - Device is in passive mode

Local information:
Actor                       LACP port     Admin     Oper    Port        Port
Port      Flags   State     Priority      Key       Key     Number      State
eth-0-9   SA      indep     32768         1         1       9         0x4d

Partner's information:

Actor             LACP port                     Oper   Port      Port
Port      Flags   Priority   Dev ID             Key    Number    State
eth-0-9   SP      0          0000.0000.0000     0      0       0x44
```

This example shows how to display details of the LACP port of a specified port:

```
Switch# show channel-group port eth-0-9
Port: eth-0-9
------------

Port state     : Up Sngl-port-Bndl Not-in-Bndl
Channel number : 1           Protocol : LACP          Channel-group  : agg1
Port index     : 9           Mode     : Active

Flags:  S - Device is sending Slow LACPDUs  F - Device is sending fast LACPDUs
        A - Device is in active mode        P - Device is in passive mode

Local information:
Actor                       LACP port     Admin     Oper    Port        Port
Port      Flags   State     Priority      Key       Key     Number      State
eth-0-9   SA      indep     32768         1         1       9         0x4d

Partner's information:

Actor             LACP port                     Oper   Port      Port
Port      Flags   Priority   Dev ID             Key    Number    State
eth-0-9   SP      0          0000.0000.0000     0      0       0x44
```

## Related Commands

None

## 3.6.26 show lacp counters

### Command Purpose

Use this command to display the packet traffic on all of the channel groups, or a specified channel group.

### Command Syntax

show lacp [ *GROUP_NUMBER* ] counters

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| GROUP_NUMBER | Channel group number | 0-63 |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to display the packet traffic on all of the channel groups:

```
Switch# show lacp counters
Traffic statistics
Port                    LACPDUs         Pkts err
                     Sent     Recv     Sent     Recv
-----------------------------------------------------------
Channel-group agg1
eth-0-9              27       0        0        0
```

### Related Commands

None

## 3.6.27 show lacp sys-id

### Command Purpose

Use this command to display the LACP system ID.

### Command Syntax

show lacp sys-id

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to display the LACP system ID:

```
Switch# show lacp sys-id
System ID: 32768,4600.0987.6c01
```

### Related Commands

None

## 3.6.28 clear lacp counters

### Command Purpose

Use this command to clear all counters of all of the channel groups, or a specified channel group.

## Command Syntax

clear lacp ( *GROUP_NUMBER* | ) counters

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| GROUP_NUMBER | Channel group number | 0-63 |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to clear all counters of all of the channel groups:

```
Switch# clear lacp counters
```

This example shows how to clear a specified channel group:

```
Switch# clear lacp 10 counters
```

## Related Commands

None

# 3.6.29 debug lacp

## Command Purpose

Use this command to specify the options for the displayed debugging information for LACP cli, LACP event, LACP ha, LACP packet, LACP sync and LACP timer. Use the no parameter with this command to disable all debugging.

## Command Syntax

debug lacp ( all | cli | event | ha | packet | sync | timer )

no debug lacp ( all | cli | event | ha | packet | sync | timer )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| all | All LACP debug information | - |
| cli | LACP commands debug information is displayed | - |
| event | LACP events debug information is displayed | - |
| ha | LACP high availability events debug information is displayed | - |
| packet | LACP packet contents debug information is displayed | - |
| sync | LACP synchronization debug information is displayed | - |
| timer(detail\|) | LACP timer expiry debug information is displayed | - |

## Command Mode

Privileged EXEC

## Default

Disabled

## Usage

None

## Examples

The following example displays information about the lacp packets that are received and sent out from the connected router:

```
Switch# debug lacp packet
```

### Related Commands

show debugging lacp

## 3.6.30 show debugging lacp

### Command Purpose

Use this command to display the LACP debugging status for these debugging options: LACP cli debugging, LACP event debugging, LACP ha debugging, LACP packet debugging, LACP sync debugging and LACP timer debugging.

### Command Syntax

show debugging lacp

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following is sample output from the show debugging lacp command:

```
Switch# show debuging lacp
LACP debugging status:
  LACP packet debugging is on
```

### Related Commands

debug lacp all

# 3.7 VLAN Classification Commands

## 3.7.1 vlan classifier activate

### Command Purpose

Use this command to apply vlan classifier group to an interface.

To remove it, use the no form of this command.

### Command Syntax

vlan classifier activate *GROUP_NUMBER* based ( ip | mac | protocol )

no vlan classifier activate

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| GROUP_NUMBER | VLAN classifier group id | 0-31, only group id 31 can be used for protocol |
| ip | Based on ip | - |
| mac | Based on MAC | - |
| protocol | Based on protocol | - |

### Command Mode

Interface Configuration

### Default

None

### Usage

An interface can only be applied by one vlan classifier group.

One vlan classifier group can apply more than one interface.

This command applies vlan classifier group to interface, and the interface can classify packets to different vlan according to the rule in vlan classifier group.

To create the rule, refer to vlan classifier rule command.

To create the group, refer to vlan classifier group command.

## Examples

This example shows how to apply vlan classifier group 1 to the interface:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# vlan classifier activate 1 based ip
```

This example shows how to remove the vlan classifier group 1 from the interface:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no vlan classifier activate
```

## Related Commands

vlan classifier group

vlan classifier rule

# 3.7.2 vlan classifier group

## Command Purpose

Use this command to add or delete rule to vlan classifier group. Use the no form of this command to delete the group.

## Command Syntax

vlan classifier group *GROUP_NUMBER* ( add | delete ) rule *RULE*

no vlan classifier group group

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| GROUP_NUMBER | VLAN classifier group id | 0-31, only group id 31 can be used for protocol |
| add | Add rule to vlan classifier group | - |
| delete | Delete rule to vlan classifier group | - |
| RULE | The id of rule | 0-4095 |

## Command Mode

Global Configuration

## Default

None

## Usage

To create the rule, refer to vlan classifier rule command.

To apply the vlan classifier group to an interface, refer to vlan classifier activate command.

When add a rule to the group by this command, the rule will be active immediately if the group has been applied to an interface already.

When delete a rule from the group by this command, the rule on this interface will be inactive immediately if the group is still applied to that interface.

The vlan classifier group will be deleted when the last rule on this group is deleted.

## Examples

This example shows how to add rule1 to vlan classifier group 1:

```
Switch# configure terminal
Switch(config)# vlan classifier group 1 add rule 1
```

This example shows how to delete rule1 from vlan classifier group 1:

```
Switch# configure terminal
Switch(config)# vlan classifier group 1 delete rule 1
```

This example shows how to delete vlan classifier group 1:

```
Switch# configure terminal
Switch(config)# no vlan classifier group 1
```

## Related Commands

vlan classifier activate

vlan classifier rule

## 3.7.3 vlan classifier rule

### Command Purpose

Use this command to create vlan classifier rule.

To remove the vlan classifier rule, use the no form of this command.

### Command Syntax

vlan classifier rule *RULE* ( ip *IP_ADDR* | ip *IP_ADDR/PREFIX-LENGTH* | ipv6 *IPV6_ADDR* | mac *MAC_ADDR* | protocol ( arp | ip | mpls | mpls-mcast | pppoe | rarp ) ) vlan *VLAN_ID*

no vlan classifier rule *RULE*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| RULE | The id of vlan classifier rule | 0-4095 |
| IP_ADDR | The source of ipv4 address in packets | IPv4 address |
| PREFIX-LENGTH | Prefix length for the ip address. | 1-32 |
| IPV6_ADDR | The source of ipv6 address in packets | IPv6 address |
| MAC_ADDR | The source of mac address in packets | Mac address in HHHH.HHHH.HHHH format |
| protocol | Specify an ethernet protocol classification | - |
| arp | Specifiy ARP protocol | - |
| ip | Specifiy IP protocol | - |
| mpls | Specifiy MPLS protocol | - |
| mpls-mcast | Specifiy MPLS multi cast protocol | - |
| pppoe | Specifiy PPPOE protocol | - |
| rarp | Specifiy RARP protocol | - |
| VLAN_ID | The vlan id to be assigned | 1-4094 |

### Command Mode

Global Configuration

### Default

None

### Usage

The rule will be effective only in inbound on interface.

The vlan id assigned by vlan classifier rule will be appended to the packets which match the rule.

To add this rule to vlan classifier group or apply the group to an interface, refer to vlan classifier group and vlan classifier activate command.

### Examples

This example shows how to create rule1 which will classify all ipv4 packets to vlan11:

```
Switch# configure terminal
Switch(config)# vlan classifier rule 1 protocol ip vlan 11
```

This example shows how to delete rule1:

```
Switch# configure terminal
Switch(config)# no vlan classifier rule 1
```

### Related Commands

vlan classifier group

vlan classifier activate

## 3.7.4 vlan classifier default-action

### Command Purpose

Use this command to set action when not hit vlan classifier rule. Use the no form of this command to restore default action.

### Command Syntax

vlan classifier default-action drop

no vlan classifier default-action drop

### Command Mode

Interface Configuration

### Default

None

### Usage

When packet input the port which enable vlan classifier and not hit any vlan classifier rule, the packet will be dropped.

### Examples

This example shows how to set default action drop:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# vlan classifier default-action drop
```

This example shows how to set default action not drop:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no vlan classifier default-action drop
```

### Related Commands

vlan classifier activate

## 3.7.5 show vlan classifier group

### Command Purpose

Use this command to show the information about vlan classifier group.

### Command Syntax

show vlan classifier group *GROUP_ID*

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| GROUP_ID | VLAN classifier group id | 0-31, only group id 31 can be used for protocol |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to display information about vlan classifier group 1:

```
Switch# show vlan classifier group 1
```

### Related Commands

show vlan classifier interface

show vlan classifier rule

## 3.7.6 show vlan classifier interface

### Command Purpose

Use this command to show the information about vlan classifier group on interface.

### Command Syntax

show vlan classifier interface group *GROUP_ID*

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| GROUP_ID | VLAN classifier group id | 0-31, only group id 31 can be used for protocol |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to display information about vlan classifier group 1 on interface:

```
Switch# show vlan classifier interface group 1
```

## Related Commands

show vlan classifier group

show vlan classifier rule

# 3.7.7 show vlan classifier rule

## Command Purpose

Use this command to show the information about vlan classifier rule.

## Command Syntax

show vlan classifier rule ( *RULE* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| RULE | The id of vlan classifier rule | 0-4095 |

## Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to display information about all the vlan classifier rules:

```
Switch# show vlan classifier rule
```

This example shows how to display information about the vlan classifier rule1:

```
Switch# show vlan classifier rule 1
```

### Related Commands

show vlan classifier group

show vlan classifier interface

## 3.7.8 show resource vlan-classification

### Command Purpose

Use this command to display the resource statistic used by vlan classification rules.

### Command Syntax

show resource vlan-classification

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following is sample output from the show resource vlan-classification command:

```
Switch# show resource vlan-classification
VLAN-CLASS
Resource                              Used          Capability
============================================================
MAC Based VLAN Classification    0             512
IPv4 Based VLAN Classification   0             512
```

### Related Commands

None

## 3.8 VLAN Mapping Commands

### 3.8.1 ethernet evc

### Command Purpose

Use this command to add or delete EVC table.

### Command Syntax

ethernet evc *WORD*

no ethernet evc *WORD*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| WORD | EVC name | Up to 16 characters |

### Command Mode

Global Configuration

### Default

None

### Usage

None

### Examples

Create ethernet evc evc_table:

```
Switch# configure terminal
Switch(config)# ethernet evc evc_table
Switch(config-evc)# dot1q mapped-vlan 10
```

### Related Commands

show ethernet evc NAME

## 3.8.2 dot1q mapped-vlan

### Command Purpose

Use this command to add evc entry to EVC table.

### Command Syntax

dot1q mapped-vlan *VLAN_ID*

no dot1q mapped-vlan

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Mapped vlan id | 1-4094 |

### Command Mode

EVC Configuration

### Default

None

## Usage

None

## Examples

Add EVC mapped-vlan entry, mapped vlan is 100:

```
Switch# configure terminal
Switch(config)# ethernet evc evc_table
Switch(config-evc)# dot1q mapped-vlan 100
```

## Related Commands

show ethernet evc NAME

# 3.8.3 dot1q mapped-double-vlan

## Command Purpose

Use this command to add evc entry with double vlans to EVC table.

## Command Syntax

dot1q mapped-double-vlan *INNER_VLAN_ID OUTER_VLAN_ID*

no dot1q mapped-double-vlan

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INNER_VLAN_ID | Mapped inner vlan id | 1-4094 |
| OUTER_VLAN_ID | Mapped outer vlan id | 1-4094 |

## Command Mode

EVC Configuration

## Default

None

## Usage

This command is only used for untagged packet

## Examples

Add EVC mapped-vlan entry, mapped inner vlan is 100, mapped outer vlan is 10:

```
Switch# configure terminal
Switch(config)# ethernet evc evc_table
Switch(config-evc)# dot1q mapped-double-vlan 100 10
```

## Related Commands

show ethernet evc NAME

# 3.8.4 vlan mapping table

## Command Purpose

Use this command to add or delete vlan mapping table.

## Command Syntax

vlan mapping table *WORD*

no vlan mapping table *WORD*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| WORD | The name of vlan mapping table | Up to 16 characters |

## Command Mode

Global Configuration

## Default

None

## Usage

None

## Examples

Create vlan mapping table VMT:

```
Switch# configure terminal
Switch(config)# vlan mapping table VMT
Switch(config-vlan-mapping)#
```

## Related Commands

show vlan mapping table WORD

# 3.8.5 raw vlan group

## Command Purpose

Use this command to create raw VLAN group.

## Command Syntax

raw vlan group *GROUP_ID* vlan *VLAN_LIST*

no raw vlan group *GROUP_ID*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| GROUP_ID | Raw vlan group id | 1-64 |
| VLAN_LIST | The VLAN ID list, example: 2-5,9-11 | vlan list connected with '-' and ',', for example, "1-10,15,20,30-40" |

## Command Mode

Global Configuration

## Default

None

## Usage

None

## Examples

Create raw VLAN group 1 and the VLAN list is from 10 to 20:

```
Switch# configure terminal
Switch(config)# raw vlan group 1 vlan 10-20
```

## Related Commands

show vlan mapping table WORD

# 3.8.6 raw-vlan

## Command Purpose

Use this command to add vlan mapping entry into vlan mapping table.

## Command Syntax

raw-vlan ( *VLAN_ID* | out-of-range | untagged | group *GROUP_ID* ) evc *WORD*

no raw-vlan ( *VLAN_ID* | out-of-range | untagged | group )

raw-vlan *INNER_VLAN OUTER_VLAN* egress-vlan ( untagged | *MAPPED_VLAN* )

raw-vlan *INNER_VLAN OUTER_VLAN* evc *WORD*

no raw-vlan *INNER_VLAN OUTER_VLAN* egress-vlan

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Raw vlan id, range from 1~4094, the format could be 1,2,3 or 1-20. | vlan list connected with '-' and ',', for example, "1-10,15,20,30-40" |
| out-of-range | Vlan id isn't specified | - |
| untagged | Untagged packet | - |
| group GROUP_ID | Raw VLAN group, The group will use less resource compare with VLAN range. | 1-64 |
| WORD | EVC name | Up to 16 characters |

| | | |
|---|---|---|
| INNER_VLAN | Inner vlan id | 1-4094 |
| OUTER_VLAN | Outer vlan id | 1-4094 |
| MAPPED_VLAN | Mapped vlan id | 1-4094 |

### Command Mode

VLAN Mapping Configuration

### Default

None

### Usage

None

### Examples

Add vlan mapping entry, raw vlan is from 10 to 20, mapped evc is evc_table:

```
Switch# configure terminal
Switch(config)# vlan mapping table VMT
Switch(config-vlan-mapping)# raw-vlan 10-20 evc evc_table
```

### Related Commands

show vlan mapping table WORD

## 3.8.7 dot1q ethertype

### Command Purpose

Use this command to set ethertype on interface.

### Command Syntax

dot1q ethertype *VALUE*

no dot1q ethertype

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VALUE | Specify The ethertype of VLAN tag. | The format is HEX, the default value is 0x8100 |

## Command Mode

Interface Configuration

## Default

None

## Usage

None

## Examples

Set ethertype to 0x9100:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# dot1q ethertype 9100
```

## Related Commands

None

# 3.8.8 show vlan mapping table

## Command Purpose

Use this command to display current vlan mapping table.

## Command Syntax

show vlan mapping table ( *WORD* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| WORD | The vlan mapping table to be displayed | Up to 16 characters |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example show all vlan mapping table existed in system:

```
Switch# show vlan mapping table
Table Name       EVC Name         Mapped VLAN  Forward Interface  Raw VLAN
================ ================ =========== ================== ==============
VMT              evc_table        100         n/a                10-20
VMT_double       evc_double       10(100)     n/a                untagged
VMT_forward      evc_forward      20          eth-0-9            30
```

## Related Commands

show vlan mapping table applied-interface

# 3.8.9 show vlan mapping table applied-interface

## Command Purpose

Use this command to display who is using the vlan mapping table of interface.

## Command Syntax

show vlan mapping table applied-interface

## Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example show which interface used the vlan mapping table:

```
Switch# show vlan mapping table applied-interface
 Table Name        Interface Name     Type
 ==============    ================  ================
 VMT                 eth-0-1             802.1Q-Tunnel
```

### Related Commands

show vlan mapping table WORD

## 3.8.10 switchport mode

### Command Purpose

Use this command to configure switchport mode

### Command Syntax

switchport mode ( access | trunk | dot1q-tunnel )

no switchport dot1q-tunnel

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| access | Configure this port to access port | - |
| trunk | Configure this port to trunk port | - |
| dot1q-tunnel | Configure this port to dot1q-tunnel port | - |

### Command Mode

Interface Configuration

### Default

None

### Usage

None

### Examples

This example shows how to configure a switchport to dot1q-tunnel port:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# switchport mode dot1q-tunnel
```

### Related Commands

show interface switchport

## 3.8.11 switchport dot1q-tunnel type

### Command Purpose

Use this command to configure dot1q-tunnel type.

### Command Syntax

switchport dot1q-tunnel type ( basic | selective )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| basic | Dot1q-tunnel basic type | - |
| selective | Dot1q-tunnel selective type | - |

### Command Mode

Interface Configuration

### Default

basic type

### Usage

None

### Examples

This command is used to configure dot1q-tunnel type:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# switchport dot1q-tunnel type selective
```

### Related Commands

show interface switchport

## 3.8.12 switchport dot1q-tunnel native

### Command Purpose

Use this command to configure a switch-port's default vlan.

### Command Syntax

switchport dot1q-tunnel native ( vlan | inner-vlan ) *VLAN_ID*

no switchport dot1q-tunnel native vlan

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| vlan | VLAN that will be added | - |
| inner-vlan | Untagged inner VLAN | - |
| VLAN_ID | Vlan Id | 1-4094 |

### Command Mode

Interface Configuration

### Default

None

### Usage

None

### Examples

Configure the eth-0-1 to dot1q-tunnel and configure this port's native to vlan 10:

```
Switch# configure terminal
Switch(config)# vlan database
Switch(config-vlan)# vlan 100
Switch(config-vlan)# exit
Switch(config)# interface eth-0-23
Switch(config-if)# switchport mode dot1q-tunnel
Switch(config-if)# switchport dot1q-tunnel native vlan 100
```

### Related Commands

None

## 3.8.13 switchport dot1q-tunnel allow vlan

### Command Purpose

Use this command to configure dot1q-tunnel allowed vlan.

### Command Syntax

switchport dot1q-tunnel allow vlan ( all | none | add *VLAN_ID* | remove *VLAN_ID* )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| all | Add all VLANs to the allowed VLAN list | - |
| none | Remove all VLANs from the allowed VLAN list | - |
| add VLAN_ID | Add VLANs to the allowed VLAN list | 1-4094 |
| remove VLAN_ID | Remove VLANs from the allowed VLAN list | 1-4094 |

### Command Mode

Interface Configuration

### Default

None

### Usage

None

### Examples

Configure dot1q-tunnel allowed vlan 100 on interface:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# switchport dot1q-tunnel allowed vlan add 100
```

### Related Commands

show vlan brief

## 3.8.14 switchport dot1q-tunnel vlan mapping table

### Command Purpose

Use this command to apply vlan mapping table on selective dot1q tunnel port.

### Command Syntax

switchport dot1q-tunnel vlan mapping table *WORD*

no switchport dot1q-tunnel vlan mapping table

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| WORD | VLAN mapping table name | Up to 16 characters |

### Command Mode

Interface Configuration

### Default

None

### Usage

Apply exist vlan mapping table on dot1q-tunnel port. The type of dot1q-tunnel port should be selective.

### Examples

The following is a sample that applying vlan mapping table on selective dot1q tunnel port:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# switchport dot1q-tunnel vlan mapping table mp
```

### Related Commands

show interface switchport

## 3.8.15 switchport dot1q-tunnel vlan mapping miss-forward

### Command Purpose

Use this command to set packet do normal forward when vlan mapping table is not matched on selective dot1q tunnel port.

### Command Syntax

switchport dot1q-tunnel vlan mapping miss-forward

no switchport dot1q-tunnel vlan mapping miss-forward

### Command Mode

Interface Configuration

### Default

None

### Usage

Need to swith the dot1q-tunnel port in selective type before config this command.

### Examples

The following is a sample that set packet do normal forward when vlan mapping table is not matched on selective dot1q tunnel port:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# switchport dot1q-tunnel vlan mapping miss-forward
```

### Related Commands

None

## 3.8.16 switchport trunk vlan-translation

### Command Purpose

Use this command to enable vlan translation.

### Command Syntax

switchport trunk vlan-translation

no switchport trunk vlan-translation

### Command Mode

Interface Configuration

### Default

None

## Usage

Use this command to enable vlan translation on trunk port. Only trunk port can enable vlan translation.

## Examples

The following is a sample that enabling vlan translation on trunk port:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# switchport mode trunk
Switch(config-if)# switchport trunk vlan-translation
```

## Related Commands

show interface switchport

# 3.8.17 switchport trunk vlan-translation mapping table

## Command Purpose

Use this command to apply vlan mapping table on vlan translation port.

## Command Syntax

switchport trunk vlan-translation mapping table *WORD*

no switchport trunk vlan-translation mapping table

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| WORD | VLAN mapping table name | Up to 16 characters |

## Command Mode

Interface Configuration

## Default

None

### Usage

Use this command to apply vlan mapping on vlan translation port.

### Examples

The following is a sample that applying vlan mapping on vlan translation port:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# switchport trunk vlan-translation vlan mapping table map_table
```

### Related Commands

show interface switchport

## 3.8.18 switchport trunk vlan-translation miss-forward

### Command Purpose

Use this command to allow the packet which not match vlan mapping table forward

### Command Syntax

switchport trunk vlan-translation mapping miss-forward

no switchport trunk vlan-translation mapping miss-forward

### Command Mode

Interface Configuration

### Default

None

### Usage

None

### Examples

The following is a sample that let the packet which not matched vlan mapping table forward:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# switchport trunk vlan-translation mapping miss-forward
```

### Related Commands

None

## 3.8.19 vlan dot1q tag native

### Command Purpose

Use this command to set tag the vlan on packet if in default vlan

### Command Syntax

vlan dot1q tag native

no vlan dot1q tag native

### Command Mode

Interface Configuration

### Default

None

### Usage

None

### Examples

The following is a sample that tag the vlan if in default vlan:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# vlan dot1q tag native
```

### Related Commands

None

## 3.8.20 show resource vlan-mapping

### Command Purpose

Use this command to display the resource statistic used by vlan mapping table.

### Command Syntax

show resource vlan-mapping

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following is sample output from the show resource vlan-mapping command:

```
Switch# show resource vlan-mapping
VLAN-MAPPING
Resource                        Used          Capability
============================================================
Applied VLAN Mapping Entry   0             1024
```

### Related Commands

None

# 3.9 GVRP Commands

## 3.9.1 gvrp

### Command Purpose

Using this command to enable GVRP on the switch . Use the 'no' form of this command to disable GVRP.

### Command Syntax

gvrp

no gvrp

### Command Mode

Global Configuration

### Default

Disable

### Usage

Use this command to globally enable the GVRP of the switch.

### Examples

Enable the GVRP of the switch.

```
Switch(config)# gvrp
```

### Related Commands

None

## 3.9.2 gvrp dynamic-vlan-creation

### Command Purpose

Enable the dynamic VLAN creation function using the “gvrp dynamic-vlan-creation” command, allowing the creation of dynamic VLANs. Use the 'no' form of this command to disable dynamic VLAN creation.

### Command Syntax

gvrp dynamic-vlan-creation

no gvrp dynamic-vlan-creation

### Command Mode

Global Configuration

### Default

Disable

### Usage

Enable the dynamic VLAN creation function using the “gvrp dynamic-vlan-creation” command, allowing the creation of dynamic VLANs.

### Examples

Enable dynamic VLAN creation for GVRP of the switch.

```
Switch(config)# gvrp dynamic-vlan-creation
```

### Related Commands

gvrp

## 3.9.3 gvrp interface

### Command Purpose

Enable the GVRP of the interface using the “gvrp interface” command. Use the 'no' form of this command to disable GVRP for the interface.

### Command Syntax

gvrp interface (all | interface IFNAME)

no gvrp interface (all | interface IFNAME)

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | The interface name that needs to enable GVRP functionality | - |

### Command Mode

Global Configuration

### Default

Disable

### Usage

Enable the GVRP of the interface using the “gvrp interface” command.

### Examples

Enable GVRP for interface eth-0-1.

```
Switch(config)# gvrp interface eth-0-1
```

### Related Commands

gvrp

## 3.9.4 gvrp registration

### Command Purpose

Use “gvrp registration” to configure the GVRP registration mode of the interface.

### Command Syntax

gvrp registration (fixed | forbidden | normal | restricted) IFNAME

Normal: The interface can transmit VLAN advertisements and can also receive and process VLAN advertisements from other devices. Upon receiving an advertisement, it will dynamically create the VLAN locally and register it to this interface.

Fixed: The interface will not transmit VLAN advertisements and will ignore all received VLAN advertisements. Only VLANs that are manually and statically configured on this interface are allowed to pass through.

Forbidden: The interface is prohibited from dynamically registering or unregistering VLANs and will not propagate any VLAN information except for VLAN 1. In other words, for a Trunk interface configured in Forbidden mode, even if it is set to allow all VLANs to pass, the actual VLAN that can pass through will only be VLAN 1.

### Command Mode

Global Configuration

### Default

normal

### Usage

Use the “gvrp registration” command to configure the GVRP registration mode of the interface.

### Examples

Configure the GVRP registration mode of interface eth-0-1 to be fixed.

```
Switch(config)# gvrp registration fixed eth-0-1
```

### Related Commands

gvrp

gvrp interface

## 3.9.5 gvrp timer

### Command Purpose

Use “gvrp timer” to configure timer parameters related to GVRP.

### Command Syntax

gvrp timer (join | leave | leaveall) TIMER_VALUE IFNAME

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| TIMER_VALUE | Timer value, unit: centisecond (cs) | - |
| IFNAME | Interface for configuring timer parameters | - |

### Command Mode

Global Configuration

### Default

Join：20；leave：60；leaveall：1000

### Usage

Use the "gvrp timer" command to configure the timer parameters of the interface.

Usage restrictions:

| Timer | Lower limit of value | upper limit of value |
|---|---|---|
| Join timer | 1cs | Less than one-third of the Leave timer value. |
| Leave timer | 3 times the Jion timer value | Less than the LeaveAll timer value |
| LeaveAll timer | Greater than the Leave timer value. | 2147483647 |

### Examples

Configure the GVRP leave timer value of interface eth-0-1 to 90 centiseconds (cs).

```
Switch(config)# gvrp registration fixed eth-0-1
```

### Related Commands

gvrp

gvrp interface

## 3.10 MSTP Commands

### 3.10.1 spanning-tree enable

### Command Purpose

Use this command to enable the Spanning Tree Protocol on a bridge. Use the no parameter to disable the Spanning Tree Protocol on the bridge.

### Command Syntax

spanning-tree enable

no spanning-tree enable

### Command Mode

Global Configuration

## Default

Disable

## Usage

None

## Examples

This example shows how to global enable stp:

```
Switch# configure terminal
Switch(config)# spanning-tree enable
```

This example shows how to global disable stp:

```
Switch# configure terminal
Switch(config)# no spanning-tree enable
```

## Related Commands

show spanning-stree

# 3.10.2 spanning-tree priority

## Command Purpose

Use this command to set the bridge priority for the common instance for the default bridge. Using a lower priority indicates a higher likelihood of the bridge becoming root. Use the no parameter with this command to reset it to the default value.

## Command Syntax

spanning-tree priority *PRIORITY*

no spanning-tree priority

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PRIORITY | Bridge priority | 0-61440 |

### Command Mode

Global Configuration

### Default

The default priority is 32678 (or hex 0x8000)

### Usage

This command is used to set the priority of the bridge. The priority values must be in multiples of 4096.

### Examples

This example shows how to set the bridge priority.:

```
Switch# configure terminal
Switch(config)# spanning-tree priority 4096
```

This example shows how to reset the bridge priority to default value:

```
Switch# configure terminal
Switch(config)# no spanning-tree priority
```

### Related Commands

show spanning-stree

## 3.10.3 spanning-tree instance priority

### Command Purpose

Use this command to set the default bridge priority for an MST instance to the value specified. Use the no parameter with this command to restore the default value of the default bridge priority.

### Command Syntax

spanning-tree instance *INSTANCE_ID* priority *PRIORITY*

no spanning-tree instance *INSTANCE_ID* priority

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INSTANCE_ID | Specify the instance ID | 1-4094 |
| PRIORITY | Specify the bridge priority | 0-61440 |

### Command Mode

Global Configuration

### Default

The default value of port priority for each instance is 32768.

### Usage

The lower the priority of the bridge, there is higher likelihood that the bridge becomes a root bridge or a designated bridge for the LAN. The permitted range of values is 0-61440. The priority values must be in multiples of 4096.

### Examples

This example shows how to set the priority for instance 1:

```
Switch# configure terminal
Switch(config)# spanning-tree instance 1 priority 0
```

### Related Commands

show spanning-stree

## 3.10.4 spanning-tree forward-time

### Command Purpose

Use this command to set the time after which (if this bridge is the root bridge) each port in the default bridge changes states to learning and forwarding. This value is used by all instances. Use the no parameter with this command to restore the default value of 15 seconds.

## Command Syntax

spanning-tree forward-time *SECONDS*

no spanning-tree forward-time

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SECONDS | Forwarding time delay, in seconds, for the default bridge | 2018/4/30 |

## Command Mode

Global Configuration

## Default

The default value is 15 seconds

## Usage

The allowable range for the forward time is 4-30 seconds. It is not advisable to set the value below 7 seconds.

## Examples

This example shows how to set the forward time to 16 seconds:

```
Switch# configure terminal
Switch(config)# spanning-tree forward-time 16
```

This example shows how to reset the forward time to default value:

```
Switch# configure terminal
Switch(config)# no spanning-tree forward-time
```

## Related Commands

show spanning-stree

## 3.10.5 spanning-tree hello-time

### Command Purpose

Use this command to set the hello-time, the time in seconds after which (if this bridge is the root bridge) all the default bridges in a bridged LAN exchange Bridge Protocol Data Units (BPDUs). A very low value of this parameter leads to excessive traffic on the network, while a higher value delays the detection of topology change. This value is used by all instances.

### Command Syntax

spanning-tree hello-time *SECONDS*

no spanning-tree hello-time

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SECONDS | Hello BPDU interval | 1-10, unit:second |

### Command Mode

Global Configuration

### Default

The default hello-time value is 2

### Usage

The allowable range of values is 1-10 seconds.

### Examples

This example shows how to set the hello time to 5 seconds:

```
Switch# configure terminal
Switch(config)# spanning-tree hello-time 5
```

This example shows how to reset the hello-time to default value:

```
Switch# configure terminal
Switch(config)# no spanning-tree hello-time
```

### Related Commands

show spanning-stree

## 3.10.6 spanning-tree max-age

### Command Purpose

Use this command to set the maximum age for the default bridge. Use the no parameter with this command to restore the default value of the maximum age.

### Command Syntax

spanning-tree max-age *SECONDS*

no spanning-tree max-age

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SECONDS | The maximum time, in seconds, to listen for the root bridge | 6-40 |

### Command Mode

Global Configuration

### Default

The default value of bridge maximum age is 20 seconds.

### Usage

Maximum age is the maximum time for which (if a bridge is the root bridge) a message is considered valid. This prevents the frames from looping indefinitely. The value of maximum age should be greater than twice the value of hello time plus 1, and less than twice the value of forward delay minus 1. The allowable range for maximum age is 6-40 seconds. Configure this value sufficiently high, so that a frame generated by root can be propagated to the leaf nodes without exceeding the maximum age.

## Examples

This example shows how to set the max age to 12 seconds:

```
Switch# configure terminal
Switch(config)# spanning-tree max-age 12
```

This example shows how to reset the max age to default value:

```
Switch# configure terminal
Switch(config)# no spanning-tree max-age
```

## Related Commands

show spanning-tree

# 3.10.7 spanning-tree max-hops

## Command Purpose

Use this command to specify the maximum allowed hops for a BPDU in an MST region. This parameter is used by all the instances of the MST. To restore the default value, use the no parameter with this command.

## Command Syntax

spanning-tree max-hops *NUMBER*

no spanning-tree max-hops

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NUMBER | Max hops | 1-40 |

## Command Mode

Global Configuration

## Default

The default maximum hops in an MST region are 20

## Usage

Specifying the maximum hops for a BPDU prevents the messages from looping indefinitely in the network. When a bridge receives an MST BPDU that has exceeded the allowed maximum hops, it discards the BPDU packets.

The configuration should be shown when the bridge is MSTP mode.

## Examples

This example shows how to set the max hops to 25:

```
Switch# configure terminal
Switch(config)# spanning-tree max-hops 25
```

This example shows how to reset the max hops to default value:

```
Switch# configure terminal
Switch(config)# no spanning-tree max-hops
```

## Related Commands

show spanning-tree

# 3.10.8 spanning-tree transmit-holdcount

## Command Purpose

Use this command to set the maximum number of transmissions of BPDUs in an MST region by the transmit state machine. Use the no parameter with this command to restore the default transmit hold-count value.

## Command Syntax

spanning-tree transmit-holdcount *NUMBER*

no spanning-tree transmit-holdcount

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NUMBER | Transmit hold-count value | 1-10 |

### Command Mode

Global Configuration

### Default

Transmit hold-count default value is 3

### Usage

None

### Examples

This example shows how to set hold count to 5:

```
Switch# configure terminal
Switch(config)# spanning-tree transmit-holdcount 5
```

This example shows how to reset the hold count to default value:

```
Switch# configure terminal
Switch(config)# no spanning-tree transmit-holdcount
```

### Related Commands

show spanning-tree

## 3.10.9 spanning-tree edgeport bpdu-guard (Global)

### Command Purpose

Use this command to enable the BPDU (Bridge Protocol Data Unit) Guard feature on a bridge globally.

Use the no parameter with this command to disable the BPDU Guard feature on a bridge globally.

### Command Syntax

spanning-tree edgeport bpdu-guard

no spanning-tree edgeport bpdu-guard

### Command Mode

Global Configuration

### Default

BPDU guard is disabled

### Usage

Use the show spanning-tree command to display the bridge and port configurations for the BPDU Guard feature. It shows both the administratively configured and currently running values of the BPDU guard.

### Examples

This example shows how to enable bpdu-guard globally:

```
Switch# configure terminal
Switch(config)# spanning-tree edgeport bpdu-guard
```

### Related Commands

show spanning-tree

## 3.10.10 spanning-tree edgeport bpdu-filter (Global)

### Command Purpose

Use this command to enable the edgeport BPDU filter for the bridge globally.

Use the no parameter with this command to disable the BPDU filter for the bridge globally.

### Command Syntax

spanning-tree edgeport bpdu-filter

no spanning-tree edgeport bpdu-filter

## Command Mode

Global Configuration

## Default

BPDU filter is disabled

## Usage

Use the show spanning tree command to display administratively configured and currently running values of the BPDU filter parameter for the bridge and port.

If bpdu-guard and bpdu-filter are all configed on port, bpdu-filter has a higher priority.

## Examples

This example shows how to enable bpdu-filter globally:

```
Switch# configure terminal
Switch(config)# spanning-tree edgeport bpdu-filter
```

## Related Commands

show spanning-tree

# 3.10.11 spanning-tree port

## Command Purpose

Use this command to enable or disable spanning tree protocol on specified port.

## Command Syntax

spanning-tree port ( enable | disable )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| enable | Enable spanning protocol on this port | - |
| disable | Disable spanning protocol on this port | - |

### Command Mode

Interface Configuration

### Default

The default spanning tree state of the port is enabled.

### Usage

None

### Examples

This example shows how to enable STP on port eth-0-1:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# spanning-tree port enable
```

This example shows how to disable STP on port eth-0-1:

```
Switch# configure terminal
Switch(config-if)# spanning-tree port disable
```

### Related Commands

show spanning-tree interface

## 3.10.12 spanning-tree port-priority

### Command Purpose

Use this command to set the port priority for a bridge. A lower priority indicates a greater likelihood of the bridge becoming root.

### Command Syntax

spanning-tree port-priority *PRIORITY*

no spanning-tree port-priority

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PRIORITY | Port priority | 0-240 |

### Command Mode

Interface Configuration

### Default

The default priority is 128

### Usage

None

### Examples

This example shows how to set the priority to 240 on port eth-0-1:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# spanning-tree port-priority 240
```

### Related Commands

show spanning-tree interface

## 3.10.13 spanning-tree pathcost-standard

### Command Purpose

Use this command to set the path cost standard associated with the default bridge-group. Use the no parameter with this command to set to default value.

### Command Syntax

spanning-tree pathcost-standard ( dot1d-1998 | dot1t )

no spanning-tree pathcost-standard

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| dot1d-1998 | IEEE 802.1D-1998 standard | - |

| | | |
|---|---|---|
| dot1t | IEEE 802.1T standard | - |

### Command Mode

Global Configuration

### Default

The default pathcost-standard is dot1t

### Usage

If the pathcost-standard is changed, cost of every port will be reset and auto-calculated.

### Examples

This example shows how to set the path cost standard:

```
Switch# configure terminal
Switch(config)# spanning-tree pathcost-standard dot1d-1998
Cost of every port has been reset and auto-calculation is available
```

### Related Commands

show spanning-tree

## 3.10.14 spanning-tree path-cost

### Command Purpose

Use this command to set the cost of a path associated with the default bridge-group. The lower the path cost, the greater likelihood of the bridge becoming root. Use the no parameter with this command to calculate path cost according to interface's speed.

### Command Syntax

spanning-tree path-cost *NUMBER*

no spanning-tree path-cost

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NUMBER | The cost to be assigned to the group. | The range is 1 to 200000000 for dot1t and 1-65535 for dot1d-1998 |

## Command Mode

Interface Configuration

## Default

The default path cost value is calculated according to interface's speed

## Usage

None

## Examples

This example shows how to set the STP path-cost to 123:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# spanning-tree path-cost 123
```

This example shows how to reset the STP path-cost to deafult value:

```
Switch# configure terminal
Switch(config-if)# no spanning-tree path-cost
```

## Related Commands

show spanning-tree interface

# 3.10.15 spanning-tree link-type

## Command Purpose

Use this command to enable or disable point-to-point or shared link types. Use the no parameter with this command to disable rapid transition.

## Command Syntax

spanning-tree link-type ( auto | point-to-point | shared )

no spanning-tree link-type

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| auto | Automatically detect link type | - |
| point-to-point | Enable point to point link | - |
| shared | Disable point to point link | - |

## Command Mode

Interface Configuration

## Default

The link type is auto detected

## Usage

None

## Examples

This example shows how to set the link type to shared on port eth-0-1:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# spanning-tree link-type shared
```

## Related Commands

show spanning-tree brief

## 3.10.16 spanning-tree edgeport

### Command Purpose

Use this command to set a port as an edge-port and to enable rapid transitions. Use the no parameter with this command to set a port to its default state (not an edge-port) and to disable rapid transitions.

### Command Syntax

spanning-tree edgeport

no spanning-tree edgeport

### Command Mode

Interface Configuration

### Default

The port is not an edge-port

### Usage

None

### Examples

This example shows how to set the port eth-0-1 to edgeport:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# spanning-tree edgeport
```

This example shows how to reset the port to an non-edgeport:

```
Switch# configure terminal
Switch(config-if)# no spanning-tree edgeport
```

### Related Commands

show spanning-tree interface

## 3.10.17 spanning-tree edgeport bpdu-guard (Interface)

### Command Purpose

Use this command to enable or disable the BPDU Guard feature on a port. Use the no parameter with this command to set the BPDU Guard feature on a port to default.

### Command Syntax

spanning-tree edgeport bpdu-guard ( enable | disable | default )

no spanning-tree edgeport bpdu-guard

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| enable | Enable edgeport bpdu-guard | - |
| disable | Disable edgeport bpdu-guard | - |
| default | Default | - |

### Command Mode

Interface Configuration

### Default

BPDU guard is disabled on port

### Usage

None

### Examples

This example shows how to change port to edgeport and enable bpdu-guard on port:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# spanning-tree edgeport
Switch(config-if)# spanning-tree edgeport bpdu-guard enable
```

### Related Commands

show spanning tree interface

## 3.10.18 spanning-tree edgeport bpdu-filter (Interface)

### Command Purpose

Use this command to set edgeport BPDU filter for the port. Use the no parameter with this command to revert the port BPDU filter value to default.

### Command Syntax

spanning-tree edgeport bpdu-filter ( enable | disable | default )

no spanning-tree edgeport bpdu-filter

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| enable | Enable edgeport bpdu-filter | - |
| disable | Disable edgeport bpdu-filter | - |
| default | Default | - |

### Command Mode

Interface Configuration

### Default

BPDU filter is disabled on port

### Usage

None

### Examples

This example shows how to enable bpdu-filter on port:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
```

```
Switch(config-if)# spanning-tree edgeport
Switch(config-if)# spanning-tree edgeport bpdu-filter
```

This example shows how to disable bpdu-filter on port:

```
Switch# configure terminal
Switch(config-if)# no spanning-tree edgeport bpdu-filter
```

### Related Commands

show spanning tree interface

## 3.10.19 spanning-tree guard root

### Command Purpose

Use this command to enable the Root Guard feature for the port. This feature disables reception of superior BPDUs. Use the no parameter with this command to disable the root guard feature for the port.

### Command Syntax

spanning-tree guard root

no spanning-tree guard root

### Command Mode

Interface Configuration

### Default

Root guard is disabled

### Usage

The Root Guard feature makes sure that the port on which it is enabled is a designated port. If a port with Root Guard enabled receives a superior BPDU, it goes to a Listening state (for STP) or discarding state (for RSTP and MSTP).

## Examples

This example shows how to enable the Root Guard feature for the port:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# spanning-tree guard root
```

This example shows how to disable the Root Guard feature for the port:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no spanning-tree guard root
```

## Related Commands

None

# 3.10.20 spanning-tree guard loop

## Command Purpose

Use this command to enable the loop guard feature for the port. This feature provides additional protection against Layer 2 forwarding loops. Use the no parameter with this command to disable the loop guard feature for the port.

## Command Syntax

spanning-tree guard loop

no spanning-tree guard loop

## Command Mode

Interface Configuration

## Default

Loop guard is disabled

### Usage

The loop guard feature should be enabled on the non-designated ports. When a port enables loop guard, and BPDUs are not received on a non-designated port after max_age, the port should move into the STP loop-inconsistent blocking state, instead of the listening / learning / forwarding state, and should not pass user traffic.

### Examples

This example shows how to enable the loop guard on the port:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# spanning-tree guard loop
```

This example shows how to disable the loop guard on the port:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no spanning-tree guard loop
```

### Related Commands

spanning-tree guard root

## 3.10.21 spanning-tree bpdu-loop

### Command Purpose

Use this command to enable the bpdu loop feature for the port. This feature provides additional protection against BPDU packet forwarding loops. Use the no parameter with this command to disable the loop guard feature for the port.

### Command Syntax

spanning-tree bpdu-loop

no spanning-tree bpdu-loop

### Command Mode

Global Configuration

## Default

BPDU loop is enabled

## Usage

When bpdu-loop enable, If an interface receives more than three bpdu packets in one second whose MACSA is interface's MAC, errdisable this interface by bpdu loop reason.

## Examples

This example shows how to enable the bpdu-loop:

```
Switch# configure terminal
Switch(config)# spanning-tree bpdu-loop
```

This example shows how to disable the bpdu-loop:

```
Switch# configure terminal
Switch(config)# no spanning-tree bpdu-loop
```

## Related Commands

None

# 3.10.22 spanning-tree force-version

## Command Purpose

Use this command to specify the version. A version identifier of less than a value of 2 enforces the spanning tree protocol. Although the command supports an input range of 0-3, for RSTP, the valid range is 0-2. Use the no parameter with this command to set the default protocol version.

## Command Syntax

spanning-tree force-version *NUMBER*

no spanning-tree force-version

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NUMBER | Version identifier. | 0 - STP, 1- Not supported, 2 - RSTP, 3 - MSTP |

## Command Mode

Interface Configuration

## Default

STP default 0, RSTP default 2, MSTP default 3

## Usage

None

## Examples

This example shows how to specify the version:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# spanning-tree force-version 1
```

This example shows how to reset the default version:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no spanning-tree force-version
```

## Related Commands

None

# 3.10.23 spanning-tree restricted-tcn

## Command Purpose

Use this command to set the restricted TCN value of the port to TRUE. Use the no parameter with this command to set the restricted TCN value of the port to FALSE.

## Command Syntax

spanning-tree restricted-tcn

no spanning-tree restricted-tcn

## Command Mode

Interface Configuration

## Default

The default restricted TCN value is FALSE

## Usage

None

## Examples

This example shows how to set the restricted TCN value of the port to TRUE:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# spanning-tree restricted-tcn
```

This example shows how to set the restricted TCN value of the port to FALSE:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no spanning-tree restricted-tcn
```

## Related Commands

None

# 3.10.24 spanning-tree restricted-role

## Command Purpose

Use this command to set the restricted-role value of the port to TRUE. Use the no parameter with this command to set the restricted-role value of the port to FALSE.

## Command Syntax

spanning-tree restricted-role

no spanning-tree restricted-role

## Command Mode

Interface Configuration

## Default

The default restricted-role value is FALSE

## Usage

None

## Examples

This example shows how to set the restricted-role value of the port to TRUE:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# spanning-tree restricted-role
```

This example shows how to set the restricted-role value of the port to FALSE:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no spanning-tree restricted-role
```

## Related Commands

None

# 3.10.25 spanning-tree tc-protection

## Command Purpose

Use this command to set the tc-protection value to TRUE. Use the no parameter with this command to set the tc-protection value to FALSE. If tc-protection is set,

the number of tc packets which can be processed every hello time interval shouldn't be greater than the number of tc-protection threshold.

### Command Syntax

spanning-tree tc-protection

no spanning-tree tc-protection

### Command Mode

Global Configuration

### Default

The default tc-protection value is FALSE

### Usage

None

### Examples

This example shows how to set the tc-protection value to TRUE:

```
Switch# configure terminal
Switch(config)# spanning-tree tc-protection
```

This example shows how to set the tc-protection value to FALSE:

```
Switch# configure terminal
Switch(config)# no spanning-tree tc-protection
```

### Related Commands

None

## 3.10.26 spanning-tree tc-protection threshold

### Command Purpose

Use this command to set the tc-protection threshold value. Use the no parameter with this command to set the tc-protection threshold value to 1. If tc-protection is

set, the number of tc packets which can be processed every hello time interval shouldn't be greater than the number of tc-protection threshold.

## Command Syntax

spanning-tree tc-protection threshold *NUMBER*

no spanning-tree tc-protection threshold

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NUMBER | Tc-protection threshole value, default 1 | 1-255 |

## Command Mode

Global Configuration

## Default

The default tc-protection threshold value is 1

## Usage

None

## Examples

This example shows how to set the tc-protection to 255:

```
Switch# configure terminal
Switch(config)# spanning-tree tc-protection threshold 255
```

This example shows how to reset the tc-protection to default value:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no spanning-tree tc-protection threshold
```

## Related Commands

None

# 3.10.27 spanning-tree mode

## Command Purpose

Use this command to set spanning tree mode.

## Command Syntax

spanning-tree mode ( stp | rstp | mstp )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| stp | spanning tree protocol | - |
| rstp | rapid spanning tree protocol | - |
| mstp | multiple spanning tree protocol | - |

## Command Mode

Global Configuration

## Default

The default spanning-tree mode is rstp

## Usage

None

## Examples

This example shows how to set the spanning tree mode to mstp:

```
Switch# configure terminal
Switch(config)# spanning-tree mode mstp
```

## Related Commands

None

# 3.10.28 spanning-tree instance port-priority

## Command Purpose

Use this command to set the port priority for a bridge group. Use the no parameter with this command to restore the default priority value.

## Command Syntax

spanning-tree instance *INSTANCE_ID* port-priority *PRIORITY*

no spanning-tree instance *INSTANCE_ID* port-priority

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INSTANCE_ID | Specify the identifier | 1-4094 |
| PRIORITY | Specify the port priority (a lower priority indicates greater likelihood of the interface becoming a root). The range is 0~240 | 0-240 |

## Command Mode

Interface Configuration

## Default

The default priority is 128

## Usage

The Multiple Spanning Tree Protocol uses port priority as a tiebreaker to determine which port should forward frame for a particular instance on a LAN, or which port should be the root port for an instance. A lower value implies a better priority. In the case of the same priority, the interface index will serve as the tiebreaker, with the lower-numbered interface being preferred over others.

The permitted range is 0-240. The priority values can only be set in increments of 16.

## Examples

This example shows how to set the port priority to 112 for instance 3:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# spanning-tree instance 3 port-priority 112
```

This example shows how to reset the port priority to defaule value for instance 3:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no spanning-tree instance 3 port-priority
```

## Related Commands

None

# 3.10.29 spanning-tree instance path-cost

## Command Purpose

Use this command to set the cost of a path associated with an interface. Use the no parameter with this command to restore the default cost value of the path.

## Command Syntax

spanning-tree instance *INSTANCE_ID* path-cost *COST*

no spanning-tree instance *INSTANCE_ID* path-cost

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INSTANCE_ID | Specify the identifier | 1-4094 |
| COST | Specify the cost of path | <1-200000000> for dot1t and <1-65535> for dot1d-1998 (a lower path-cost indicates a greater likelihood of the specified interface becoming a root) |

## Command Mode

Interface Configuration

## Default

Assuming a 10 Mb/s link speed, the default value is configured as 2,000,000

## Usage

Before you can use this command to set a path-cost in a VLAN configuration, you must explicitly add an MST instance to a port using the bridge-group instance command (see the example below).

## Examples

This example shows how to set the cost of a path associated with an interface:

```
Switch# configure terminal
Switch(config)# spanning-tree mst configuration
Switch(config-mst)# instance 3 vlan 3
Switch(config-mst)# exit
Switch(config)# interface eth-0-1
Switch(config-if)# switchport mode trunk
Switch(config-if)# switchport trunk allowed vlan add 3
Switch(config-if)# spanning-tree instance 3 path-cost 1000
Switch(config-mst)# exit
Switch(config)# interface eth-0-1
Switch(config-if)# switchport mode access
Switch(config-if)# switchport access vlan 3
Switch(config-if)# spanning-tree instance 3 path-cost 1000
```

## Related Commands

None

# 3.10.30 spanning-tree instance restricted-tcn

## Command Purpose

Use this command to set the restricted TCN value for the instance to TRUE. Use the no parameter with this command to set the restricted TCN value for the instance to FALSE.

## Command Syntax

spanning-tree instance *INSTANCE_ID* restricted-tcn

no spanning-tree instance *INSTANCE_ID* restricted-tcn

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INSTANCE_ID | Specify the instance ID | 1-4094 |

## Command Mode

Interface Configuration

## Default

The default restricted TCN value is FALSE

## Usage

None

## Examples

This example shows how to set the restricted TCN value for the instance to TRUE:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# spanning-tree instance 2 restricted-tcn
```

## Related Commands

None

# 3.10.31 spanning-tree instance restricted-role

## Command Purpose

Use this command to set the restricted role value for the instance to TRUE. Use the no parameter with this command to set the restricted role value for the instance to FALSE.

## Command Syntax

spanning-tree instance *INSTANCE_ID* restricted-role

no spanning-tree instance *INSTANCE_ID* restricted-role

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| INSTANCE_ID | Specify the instance ID | 1-4094 |

### Command Mode

Interface Configuration

### Default

The default restricted-role value is FALSE.

### Usage

None

### Examples

This example shows how to set the restricted role value for the instance to TRUE:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# spanning-tree instance 2 restricted-role
```

### Related Commands

None

## 3.10.32 spanning-tree mst configuration

### Command Purpose

Use this command to enter mst configuration mode.

### Command Syntax

spanning-tree mst configuraiton

### Command Mode

Global Configuration

## Default

None

## Usage

None

## Examples

This example shows how to enter into mst configuration mode:

```
Switch# configure terminal
Switch(config)# spanning-tree mst configuration
```

## Related Commands

None

# 3.10.33 instance

## Command Purpose

Use this command to create an mstp instance and map VLANs to an MST instance.

## Command Syntax

instance *INSTANCE_ID* vlan *VLAN_ID*

no instance *INSTANCE_ID* vlan *VLAN_ID*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INSTANCE_ID | Instance id, we support at most 64 instances | 1-4094 |
| VLAN_ID | The vlan associated with instance must be created first. | 1-4094 |

## Command Mode

MST Configuration

## Default

None

## Usage

When you map VLANs to an MST instance, the mapping is incremental, and the VLANs specified in the command are added to or removed from the VLANs that were previously mapped.

## Examples

This example shows how to map vlan 10 to instance 1:

```
Switch# configure terminal
Switch(config)# vlan database
Switch(config-vlan)# vlan 10
Switch(config-vlan)# exit
Switch(config)# spanning-tree Mst configuration
Switch(config-mst)# instance 1 vlan 10
```

## Related Commands

None

# 3.10.34 region

## Command Purpose

Use this command to create mstp region.

## Command Syntax

region *NAME*

no region *NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | Specify the region name. | The name string has a maximum length of 32 characters and is case sensitive |

## Command Mode

MST Configuration

## Default

The default region name is an empty string

## Usage

None

## Examples

This example shows how to set the region to Switch :

```
Switch# configure terminal
Switch(config)# vlan database
Switch(config-vlan)# vlan 10
Switch(config-vlan)# exit
Switch(config)# spanning-tree mst configuration
Switch(config-mst)# region Switch
```

## Related Commands

None

# 3.10.35 revision

## Command Purpose

Use this command to create an mstp revision number.

## Command Syntax

revision *NUMBER*

no revision *NUMBER*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NUMBER | Specify the configuration revision number. | 0-65535 |

### Command Mode

MST Configuration

### Default

Default value is 0

### Usage

None

### Examples

This example shows how to set the revision number to 1:

```
Switch# configure terminal
Switch(config)# spanning-tree mst configuration
Switch(config-mst)# revision 1
```

### Related Commands

None

## 3.10.36 clear spanning-tree detected protocols

### Command Purpose

Use this command to clear the detected protocols for a specific bridge or interface.

### Command Syntax

clear spanning-tree detected protocols ( interface *IFNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| interface IFNAME | Specify the name of the interface on which protocols have to be cleared | - |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to clear the detected protocols for a specific bridge or interface eth-0-1:

```
Switch# clear spanning-tree detected protocols interface eth-0-1
```

### Related Commands

None

## 3.10.37 clear spanning-tree disabled-port

### Command Purpose

Use this command to clear all spanning tree protocol disabled port.

### Command Syntax

clear spanning-tree disabled-port

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to clear all spanning tree protocol disabled port:

```
Switch# clear spanning-tree disabled-port
```

### Related Commands

None

## 3.10.38 show spanning-tree

### Command Purpose

Use this command to show the state of the spanning tree. This command only shows up interface's state.

### Command Syntax

show spanning-tree

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to show the state of spanning tree:

```
Switch# show spanning-tree
  Bridge up - Spanning Tree Enabled
 Mode - Multiple spanning tree protocol
 Path Cost Standard - dot1t
 CIST Root Path Cost 0 - CIST Root Port 0 -  CIST Bridge Priority 32768
 Forward Delay 15 - Hello Time 2 - Max Age 20 - Max-hops 20
 Tx Hold Count 6
 CIST Root Id 80008afa58e9cb00
 CIST Reg Root Id 80008afa58e9cb00
 CIST Bridge Id 80008afa58e9cb00
 Edgeport bpdu-filter disabled
 Edgeport bpdu-guard disabled
 eth-0-1: Port 1 - Id 8001 - Role Designated - State Forwarding
 eth-0-1: Designated External Path Cost 0 -Internal Path Cost 0
 eth-0-1: Configured Path Cost 20000 - Add type Explicit ref count 1
 eth-0-1: Designated Port Id 8001 - CIST Priority 128
 eth-0-1: CIST Root 80008afa58e9cb00
 eth-0-1: Regional Root 80008afa58e9cb00
 eth-0-1: Designated Bridge 80008afa58e9cb00
 eth-0-1: Message Age 0 - Max Age 20
 eth-0-1: CIST Hello Time 2 - Forward Delay 15
 eth-0-1: CIST Forward Timer 0 - Msg Age Timer 0 - Hello Timer 0 - topo change t
imer 0
 eth-0-1: Forward-transitions 2
 eth-0-1: BPDU sent 373 - BPDU received 0
 eth-0-1: Version Multiple spanning tree protocol - Received None - Send MSTP
 eth-0-1: No edgeport configured - Current edgeport off
 eth-0-1: Edgeport bpdu-guard  Default - Current edgeport bpdu-guard off
 eth-0-1: Edgeport bpdu-filter Default - Current edgeport bpdu-filter off
 eth-0-1: No root guard configured - Current root guard off
 eth-0-1: No loop guard configured - Current loop guard off
 eth-0-1: Configured Link Type auto - Current point-to-point
```

### Related Commands

None

## 3.10.39 show spanning-tree interface

### Command Purpose

Use this command to show the state of the spanning tree of the specified interface.

### Command Syntax

show spanning-tree interface *IFNAME* ( brief | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | Specify the name of the interface | - |
| brief | The brief spanning-tree information | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following is an output of this command displaying the state of the spanning tree of the interface eth-0-1:

```
Switch# show spanning-tree interface eth-0-1
 Bridge up - Spanning Tree Enabled
 Mode - Multiple spanning tree protocol
 Path Cost Standard - dot1t
 CIST Root Path Cost 0 - CIST Root Port 0 -  CIST Bridge Priority 32768
 Forward Delay 15 - Hello Time 2 - Max Age 20 - Max-hops 20
 Tx Hold Count 6
 CIST Root Id 80008afa58e9cb00
 CIST Reg Root Id 80008afa58e9cb00
 CIST Bridge Id 80008afa58e9cb00
 Edgeport bpdu-filter disabled
 Edgeport bpdu-guard disabled
 eth-0-1: Port 1 - Id 8001 - Role Designated - State Forwarding
 eth-0-1: Designated External Path Cost 0 -Internal Path Cost 0
 eth-0-1: Configured Path Cost 20000 - Add type Explicit ref count 1
 eth-0-1: Designated Port Id 8001 - CIST Priority 128
 eth-0-1: CIST Root 80008afa58e9cb00
 eth-0-1: Regional Root 80008afa58e9cb00
 eth-0-1: Designated Bridge 80008afa58e9cb00
 eth-0-1: Message Age 0 - Max Age 20
 eth-0-1: CIST Hello Time 2 - Forward Delay 15
 eth-0-1: CIST Forward Timer 0 - Msg Age Timer 0 - Hello Timer 0 - topo change t
imer 0
 eth-0-1: Forward-transitions 2
 eth-0-1: BPDU sent 352 - BPDU received 0
```

```
eth-0-1: Version Multiple spanning tree protocol - Received None - Send MSTP
eth-0-1: No edgeport configured - Current edgeport off
eth-0-1: Edgeport bpdu-guard  Default - Current edgeport bpdu-guard off
eth-0-1: Edgeport bpdu-filter Default - Current edgeport bpdu-filter off
eth-0-1: No root guard configured - Current root guard off
eth-0-1: No loop guard configured - Current loop guard off
eth-0-1: Configured Link Type auto - Current point-to-point
```

### Related Commands

None

## 3.10.40 show spanning-tree brief

### Command Purpose

Use this command to show the brief state of the spanning tree.

### Command Syntax

show spanning-tree brief

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following is an output of this command displaying the brief state of the spanning tree The down interface should not be show:

```
Switch# show spanning-tree brief
Multiple spanning tree protocol Enabled
Root ID     Priority    32768 (0x8000)
            Address     8afa.58e9.cb00
```

```
            Hello Time  2 sec  Max Age  20 sec Forward Delay 15 sec
Bridge ID   Priority    32768 (0x8000)
            Address     8afa.58e9.cb00
            Hello Time  2 sec  Max Age  20 sec Forward Delay 15 sec
            Aging Time  300 sec
Interface   Role           State           Cost       Priority.Number   Type
--------------------------------------------------------------------------------
eth-0-1     Designated     Forwarding      20000           128.1        P2p
eth-0-2     Designated     Forwarding      20000           128.2        P2p
```

### Related Commands

None

## 3.10.41 show spanning-tree disabled-port

### Command Purpose

Use this command to show the spanning tree protocol disabled port.

### Command Syntax

show spanning-tree disabled-port

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following is an output of this command displaying all spanning tree protocol disabled port:

```
Switch# show spanning-tree disabled-port
Interface
```

```
---------
eth-0-1
```

### Related Commands

None

## 3.10.42 show spanning-tree mst

### Command Purpose

Use this command to show the mstp information.

### Command Syntax

show spanning-tree mst

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following is an output of this command displaying the mstp information The down interface should not be show:

```
Switch#show spanning-tree mst
Bridge up - Spanning Tree Enabled
 Mode - Multiple spanning tree protocol
 Path Cost Standard - dot1t
 CIST Root Path Cost 0 - CIST Root Port 0 -  CIST Bridge Priority 32768
 Forward Delay 15 - Hello Time 2 - Max Age 20 - Max-hops 20
 Tx Hold Count 6
 CIST Root Id 80008afa58e9cb00
 CIST Reg Root Id 80008afa58e9cb00
```

```
CIST Bridge Id 80008afa58e9cb00
Edgeport bpdu-filter disabled
Edgeport bpdu-guard disabled
Instance  Interface  VLAN
0 :                   1, 3
1 :       eth-0-2     2
```

### Related Commands

None

## 3.10.43 show spanning-tree mst config

### Command Purpose

Use this command to show the mstp region configuration information.

### Command Syntax

show spanning-tree mst config

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to show the mstp region configuration information:

```
Switch#show spanning-tree mst config
MSTP Configuration Information:
-------------------------------------------------------------------------
  Format Id       : 0
  Name            : switch
  Revision Level  : 0
  Digest          : 0x3AB68794D602FDF43B21C0B37AC3BCA8
```

```
  Instances configured 1
--------------------------------------------------------------------------
Instance  Vlans mapped
--------------------------------------------------------------------------
0          1, 3
1          2
--------------------------------------------------------------------------
```

### Related Commands

None

## 3.10.44 show spanning-tree mst detail

### Command Purpose

Use this command to show the detail mstp information.

### Command Syntax

show spanning-tree mst detail ( interface *IFNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| interface IFNAME | The interface name you want to display | - |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following is an output of this command displaying the mstp information The down interface should not be show:

```
Switch#show spanning-tree mst detail interface eth-0-1
Bridge up - Spanning Tree Enabled
Mode - Multiple spanning tree protocol
Path Cost Standard - dot1t
CIST Root Path Cost 0 - CIST Root Port 0 -  CIST Bridge Priority 32768
Forward Delay 15 - Hello Time 2 - Max Age 20 - Max-hops 20
Tx Hold Count 6
CIST Root Id 80008afa58e9cb00
CIST Reg Root Id 80008afa58e9cb00
CIST Bridge Id 80008afa58e9cb00
Edgeport bpdu-filter disabled
Edgeport bpdu-guard disabled
eth-0-1: Port 1 - Id 8001 - Role Designated - State Forwarding
eth-0-1: Designated External Path Cost 0 -Internal Path Cost 0
eth-0-1: Configured Path Cost 20000 - Add type Explicit ref count 1
eth-0-1: Designated Port Id 8001 - CIST Priority 128
eth-0-1: CIST Root 80008afa58e9cb00
eth-0-1: Regional Root 80008afa58e9cb00
eth-0-1: Designated Bridge 80008afa58e9cb00
eth-0-1: Message Age 0 - Max Age 20
eth-0-1: CIST Hello Time 2 - Forward Delay 15
eth-0-1: CIST Forward Timer 0 - Msg Age Timer 0 - Hello Timer 0 - topo change t
imer 0
eth-0-1: Forward-transitions 2
eth-0-1: BPDU sent 247 - BPDU received 0
eth-0-1: Version Multiple spanning tree protocol - Received None - Send MSTP
eth-0-1: No edgeport configured - Current edgeport off
```

### Related Commands

None

## 3.10.45 show spanning-tree mst instance

### Command Purpose

Use this command to show the detail mstp information of a specific instance.

### Command Syntax

show spanning-tree mst instance *INSTANCE_ID* ( interface *IFNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INSTANCE_ID | Instance number you want to display | 1-4094 |
| IFNAME | The interface name you want to display | Support physical/aggregation ports |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following is an output of this command displaying the detail mstp information:

```
Switch#show spanning-tree mst instance 2
 MSTI Root Path Cost 0 - MSTI Root Port 0
 MSTI Root Id 8002e083bce89601
 MSTI Bridge Id 8002e083bce89601
MSTI Bridge Priority 32768

 eth-0-48: Port 48 - Id 8030 - Role Disabled - State Discarding
 eth-0-48: Designated Internal Path Cost 0  - Designated Port Id 0
 eth-0-48: Configured Internal Path Cost 20000
 eth-0-48: Configured CST External Path cost 20000
 eth-0-48: CST Priority 128  - MSTI Priority 128
 eth-0-48: Designated Root 0000000000000000
 eth-0-48: Designated Bridge 0000000000000000
 eth-0-48: Message Age 0 - Max Age 0
 eth-0-48: Hello Time 2 - Forward Delay 15
 eth-0-48: Forward Timer 0 - Msg Age Timer 0 - Hello Timer 0

 eth-0-1: Port 1 - Id 8001 - Role Disabled - State Discarding
 eth-0-1: Designated Internal Path Cost 0  - Designated Port Id 0
 eth-0-1: Configured Internal Path Cost 20000
 eth-0-1: Configured CST External Path cost 20000
 eth-0-1: CST Priority 128  - MSTI Priority 128
 eth-0-1: Designated Root 0000e083bce89601
 eth-0-1: Designated Bridge 0000e083bce89601
 eth-0-1: Message Age 0 - Max Age 0
 eth-0-1: Hello Time 2 - Forward Delay 15
 eth-0-1: Forward Timer 0 - Msg Age Timer 0 - Hello Timer 0
```

## Related Commands

None

## 3.10.46 show spanning-tree mst interface

### Command Purpose

Use this command to show the detail mstp information of a specific interface.

### Command Syntax

show spanning-tree mst interface *IFNAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | The interface name you want to display | Support physical/aggregation ports |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following is an output of this command displaying the mstp information of an interface:

```
Switch# show spanning-tree mst interface eth-0-1
Bridge up - Spanning Tree Enabled
Mode - Multiple spanning tree protocol
Path Cost Standard - dot1t
CIST Root Path Cost 0 - CIST Root Port 0 -  CIST Bridge Priority 32768
Forward Delay 15 - Hello Time 2 - Max Age 20 - Max-hops 20
Tx Hold Count 6
CIST Root Id 8000be8c722f7f00
CIST Reg Root Id 8000be8c722f7f00
CIST Bridge Id 8000be8c722f7f00
Edgeport bpdu-filter disabled
Edgeport bpdu-guard disabled
Loop guard configured disabled
```

```
Instance  Interface  VLAN
0                    1, 4-100
1         eth-0-1    2
2         eth-0-1    3
```

### Related Commands

None

## 3.10.47 show spanning-tree mst brief

### Command Purpose

Use this command to show the brief mstp information.

### Command Syntax

show spanning-tree mst brief ( interface *IFNAME* | instance *INSTANCE_ID* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| interface IFNAME | The interface name you want to display | - |
| instance INSTANCE_ID | Instance number you want to display | 1-4094 |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following is an output of this command displaying the brief mstp information:

```
Switch#show spanning-tree mst brief
##### MST0:  Vlans: 1
```

```
Multiple spanning tree protocol Enabled
Root ID     Priority    32768 (0x8000)
            Address     e083.bce8.9601
            Hello Time  2 sec  Max Age  20 sec Forward Delay 15 sec
Bridge ID   Priority    32768 (0x8000)
            Address     e083.bce8.9601
            Hello Time  2 sec  Max Age  20 sec Forward Delay 15 sec
            Aging Time 300 sec
Interface   Role          State       Cost       Priority.Number   Type
--------------------------------------------------------------------------
##### MST2:  Vlans: 2
Root ID     Priority    32770 (0x8002)
            Address     e083.bce8.9601
Bridge ID   Priority    32770 (0x8002)
            Address     e083.bce8.9601
Interface   Role          State       Int-Cost  Priority.Number   Type
--------------------------------------------------------------------------
eth-0-48    Disabled      Discarding  20000          128.48        P2p
eth-0-1     Disabled      Discarding  20000          128.1         P2p
##### MST15:  Vlans: 15
Root ID     Priority    32783 (0x800f)
            Address     e083.bce8.9601
Bridge ID   Priority    32783 (0x800f)
            Address     e083.bce8.9601
Interface   Role          State       Int-Cost  Priority.Number   Type
--------------------------------------------------------------------------
eth-0-48    Disabled      Discarding  20000          128.48        P2p
eth-0-1     Disabled      Discarding  20000          128.1         P2p
```

### Related Commands

None

## 3.10.48 spanning-tree instance forward

### Command Purpose

Use this command to set STP state is forward for instance and keep forward.

### Command Syntax

spanning-tree instance *INSTANCE_ID* forward

no spanning-tree instance *INSTANCE_ID* forward

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INSTANCE_ID | Specify the identifier | 1-4094 |

### Command Mode

Interface Configuration

### Default

None

### Usage

None

### Examples

This example shows how to set STP state is forward for instance and keep forward:

```
Switch# configure terminal
Switch(config)# spanning-tree mode mstp
Switch(config)# spanning-tree mst configuration
Switch(config-mst)# instance 1 vlan 2
Switch(config)# interface eth-0-1
Switch(config-if)# spanning-tree instance 1 forward
Switch# configure terminal
Switch(config)# interface eth-0-1
```

### Related Commands

None

## 3.10.49 spanning-tree e-stp enable

### Command Purpose

Use this command to enable the Extend Spanning Tree Protocol on a bridge. Use the no parameter to disable the Spanning Tree Protocol on the bridge.

### Command Syntax

spanning-tree e-stp enable

no spanning-tree e-stp enable

## Command Mode

Global Configuration

## Default

Disable

## Usage

None

## Examples

This example shows how to global enable e-stp:

```
Switch# configure terminal
Switch(config)# spanning-tree e-stp enable
```

This example shows how to global disable e-stp:

```
Switch# configure terminal
Switch(config)# no spanning-tree e-stp enable
```

## Related Commands

show spanning-stree e-stp

# 3.10.50 spanning-tree bridge-mac

## Command Purpose

Use this command to set the bridge mac for the common instance for the default bridge. Use the no parameter with this command to reset it to the default value.

## Command Syntax

spanning-tree bridge-mac *MAC*

no spanning-tree bridge-mac

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MAC | Bridge MAC | MAC Address in HHHH.HHHH.HHHH format |

## Command Mode

Global Configuration

## Default

The default bridge-mac is route-mac

## Usage

This command is used to set the MAC of the bridge. The bridge-mac values must be in HHHH.HHHH.HHHH format.

## Examples

This example shows how to set the bridge mac.:

```
Switch# configure terminal
Switch(config)# spanning-tree bridge-mac d458.aed6.1234
```

This example shows how to reset the bridge mac to default value:

```
Switch# configure terminal
Switch(config)# no spanning-tree bridge-mac
```

## Related Commands

show spanning-stree

show spanning-stree e-stp

# 3.10.51 show spanning-tree e-stp

## Command Purpose

Use this command to show the state of the extend spanning tree.

## Command Syntax

show spanning-tree e-stp

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to show the state of extend spanning tree:

```
Switch# show spanning-tree e-stp
 E-STP enabled
 Config Bridge Id 8000d458aed61234
 Active Bridge Id 8000d458aed61234
 Peer-link eth-0-10

 Bridge up - Spanning Tree Enabled
 Mode - Rapid spanning tree protocol
 Path Cost Standard - dot1t
 Root Path Cost 500 - Root Port 2051 -  Bridge Priority 32768
 Forward Delay 15 - Hello Time 2 - Max Age 20
 Tx Hold Count 6
 Root Id 800032061b504100
 Bridge Id 8000d458aed61234
 Last topology change Tue Oct 10 05:35:20 2023
 Edgeport bpdu-filter disabled
 Edgeport bpdu-guard disabled
 Edgeport errdisable timeout disabled
 Edgeport errdisable timeout interval 300 sec
 mlag 3: Port 2051 - Id 8803 - Role Rootport - State Forwarding
 mlag 4: Port 2052 - Id 8804 - Role Alternate - State Discarding
```

## Related Commands

None

# 3.11 Flow Control Commands

## 3.11.1 flowcontrol send

### Command Purpose

Use this command to enable or disable flow control send function.

### Command Syntax

flowcontrol send ( on | off )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| on | Set send flowcontrol enable | - |
| off | Set send flowcontrol disable | - |

### Command Mode

Interface Configuration

### Default

Off

### Usage

Use the flowcontrol Interface Configuration command to set the interface's ability to send pause frames to on or off.

### Examples

This example shows how to enable flow control on interface:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# flowcontrol send on
```

### Related Commands

flowcontrol receive on

## 3.11.2 flowcontrol receive

### Command Purpose

Use this command to enable or disable flow control receive function.

### Command Syntax

flowcontrol receive ( on | off )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| on | Set receive flowcontrol enable | - |
| off | Set receive flowcontrol disable | - |

### Command Mode

Interface Configuration

### Default

Off

### Usage

Use the flowcontrol interface configuration command to set the interface's ability to receive pause frames to on or off.

### Examples

This example shows how to enable flow control on interface:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# flowcontrol receive on
```

### Related Commands

flowcontrol send on

## 3.11.3 show flowcontrol

### Command Purpose

Use this command to display flow control information.

### Command Syntax

show flowcontrol ( *IFNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | Interface name | Support physical ports |

### Command Mode

Privileged EXEC

### Default

None

### Usage

Use the command to display flowcontrol ability and the pause frame information of each port.

### Examples

This example shows how to display flowcontrol information:

```
Switch# show flowcontrol
Port        Receive FlowControl  Send FlowControl   RxPause      TxPause
            admin    oper        admin    oper
----------  -------- --------    -------- --------  ------------ ------------
eth-0-1     off      off         off      off       0            0
eth-0-2     off      off         off      off       0            0
eth-0-3     off      off         off      off       0            0
eth-0-4     off      off         off      off       0            0
eth-0-5     off      off         off      off       0            0
eth-0-6     off      off         off      off       0            0
eth-0-7     off      off         off      off       0            0
eth-0-8     off      off         off      off       0            0
eth-0-9     off      off         off      off       0            0
eth-0-10    off      off         off      off       0            0
```

```
eth-0-11    off      off         off      off      0            0
eth-0-12    off      off         off      off      0            0
eth-0-13    off      off         off      off      0            0
eth-0-14    off      off         off      off      0            0
eth-0-15    off      off         off      off      0            0
eth-0-16    off      off         off      off      0            0
eth-0-17    off      off         off      off      0            0
eth-0-18    off      off         off      off      0            0
eth-0-19    off      off         off      off      0            0
eth-0-20    off      off         off      off      0            0
eth-0-21    off      off         off      off      0            0
eth-0-22    off      off         off      off      0            0
eth-0-23    off      off         off      off      0            0
eth-0-24    off      off         off      off      0            0
```

### Related Commands

None

## 3.12 Layer 2 Protocols Tunneling Commands

### 3.12.1 l2protocol enable

#### Command Purpose

Use this command to enable l2protocol function globally.

#### Command Syntax

l2protocol enable

no l2protocol enable

#### Command Mode

Global Configuration

#### Default

None

#### Usage

Use this command to enable l2protocol function globally.

### Examples

This example shows how to enable l2protocol function globally:

```
Switch# configure terminal
Switch(config)# l2protocol enable
```

### Related Commands

show l2protocol

## 3.12.2 l2protocol tunnel-dmac

### Command Purpose

Use this command to configure l2protocol tunnel destination MAC address.

### Command Syntax

l2protocol tunnel-dmac *MAC*

no l2protocol tunnel-dmac

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MAC | l2 protocol tunnel's destination MAC address | 0100.0CCD.CDD0-D2 or 010F.E200.0003 |

### Command Mode

Global Configuration

### Default

None

### Usage

Use this command to configure l2 protocol tunnel dmac. System default tunnel-dmac is 0100.0ccd.cdd0.

## Examples

Following is a sample that configuring 010FE2000003 as l2 protocol tunnel dmac:

```
Switch# configure terminal
Switch(config)# l2protocol tunnel-dmac 010F.E200.0003
```

## Related Commands

show l2protocol

# 3.12.3 l2protocol mac 1

## Command Purpose

Use this command to configure l2 protocol mac address globally.

## Command Syntax

l2protocol mac 1 *MAC* mask *MASK*

no l2protocol mac 1

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MAC | L2 Protocol MAC address. 0180.C200.0000~0180.C200.003F is used by other protocol, so this range is out of L2 Protocol MAC address control. | 0180.C200.0000 ~ 0180.C2FF.FFFF |
| MASK | L2 Protocol MAC MASK | FFFF.FF00.0000 ~ FFFF.FFFF.FFFF |

## Command Mode

Global Configuration

## Default

None

## Usage

Use this command to configure l2 protocol mac address globally.

## Examples

This example shows how to configure l2 protocol mac address:

```
Switch# configure terminal
Switch(config)# l2protocol mac 1 0180.c222.0000 mask ffff.ffff.0000
```

## Related Commands

l2protocol full-mac

# 3.12.4 l2protocol mac <2-6>

## Command Purpose

Use this command to configure l2 protocol mac address globally.

## Command Syntax

l2protocol mac *MAC_NUM MAC*

no l2protocol mac *MAC_NUM*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MAC_NUM | The ID of l2 protocol MAC | 2-6 |
| MAC | The MAC address of l2 protocol MAC | 0180.C200.0000 ~ 0180.C2FF.FFFF |

## Command Mode

Global Configuration

## Default

None

## Usage

Use this command to configure l2 protocol mac address globally. Should not overlap each other.

## Examples

This example shows how to configure l2 protocol mac address:

```
Switch# configure terminal
Switch(config)# l2protocol mac 3 0180.c200.0000
```

## Related Commands

l2protocol full-mac

# 3.12.5 l2protocol

## Command Purpose

Use this command to configure l2protocol pdu-mac-address to discard, peer or tunnel.

## Command Syntax

l2protocol ( stp | slow-proto | dot1x | cfm | mac *MAC_NUM* | full-mac ) ( discard | peer | tunnel ( evc *WORD* | ) | forward）

l2protocol ( cdp | vtp | lldp | all ) ( discard | peer | forward )

no l2protocol ( stp | slow-proto | dot1x | cfm | lldp | cdp | vtp | all | mac *MAC_NUM* | full-mac )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| stp | MAC: 0180.c200.0000 | - |
| slow-proto | MAC: 0180.c200.0002, ethertype: 0x8809 | - |
| dot1x | MAC: 0180.c200.0003, ethertype: 0x888e | - |
| cfm | ethertype: 0x8902 | - |
| cdp | Cisco Discovery Protocol | - |
| vtp | Vlan Trunking Protocol | - |

| | | |
|---|---|---|
| lldp | Link Layer Discovery Protocol | - |
| all | include stp, sflow-proto, dot1x, cfm, lldp, cdp, vtp | - |
| mac MAC_NUM | Globally configured mac 1-2 | 1-2 |
| discard | Discard the protocol data unit | - |
| peer | Act as peer to the customer device instance of the protocol, peer is default option | - |
| tunnel | Tunnel the protocol data unit into the SVLAN | - |
| forward | Forward the protocol data unit | - |
| full-mac | Globally configured full-mac | - |
| WORD | The evc name | Up to 15 characters |

## Command Mode

Interface Configuration

## Default

None

## Usage

Use this command to configure l2 protocol to discard, peer or tunnel.

## Examples

This example shows how to configure l2 protocol to discard:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# l2protocol stp discard
```

This example shows how to configure l2 protocol to tunnel:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# l2protocol slow-proto tunnel evc evc1
```

### Related Commands

None

## 3.12.6 l2protocol uplink enable

### Command Purpose

Use this command to configure l2 protocol uplink port.

### Command Syntax

l2protocol uplink enable

no l2protocol uplink enable

### Command Mode

Interface Configuration

### Default

None

### Usage

Use this command to configure l2 protocol uplink port.

### Examples

This example shows how to configure l2 protocol uplink port:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# l2protocol uplink enable
```

### Related Commands

None

## 3.12.7 show l2protocol

### Command Purpose

Use this display current l2 protocol tunnel configuration.

### Command Syntax

show l2protocol ( interface *IFNAME* | tunnel-dmac | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| interface IFNAME | Interface name | Support aggregation and physical ports |
| tunnel-dmac | Layer2 protocols tunnel destination MAC address | - |

### Command Mode

Privileged EXEC

### Default

None

### Usage

Use this display current l2 protocol tunnel configuration or on specified interface.

### Examples

This example shows how to display current l2 protocol tunnel configuration on interface eth-0-1:

```
Switch# show l2protocol interface eth-0-2
Interface  PDU Address        MASK            Status    EVC
           (u)-Untagged
           (t)-Tagged
=========  =================  ==============  ========  ================
eth-0-2    0100.0ccc.cccc(u)  ffff.ffff.ffff  Peer      N/A
eth-0-2    0100.0ccc.cccc(t)  ffff.ffff.ffff  Peer      N/A
eth-0-2    stp(u)             ffff.ffff.ffff  Peer      N/A
eth-0-2    stp(t)             ffff.ffff.ffff  Peer      N/A
eth-0-2    slow-proto(u)      ffff.ffff.ffff  Peer      N/A
eth-0-2    slow-proto(t)      ffff.ffff.ffff  Peer      N/A
```

```
eth-0-2    dot1x(u)          ffff.ffff.ffff  Peer      N/A
eth-0-2    dot1x(t)          ffff.ffff.ffff  Peer      N/A
eth-0-2    cfm(u)            ffff.ffff.ffff  Peer      N/A
eth-0-2    cfm(t)            ffff.ffff.ffff  Peer      N/A
eth-0-2    cdp(u)            ffff.ffff.ffff  Peer      N/A
eth-0-2    cdp(t)            ffff.ffff.ffff  Peer      N/A
eth-0-2    vtp(u)            ffff.ffff.ffff  Peer      N/A
eth-0-2    vtp(t)            ffff.ffff.ffff  Peer      N/A
eth-0-2    lldp(u)           ffff.ffff.ffff  Peer      N/A
eth-0-2    lldp(t)           ffff.ffff.ffff  Peer      N/A
```

This example shows how to display current l2 protocol tunnel configuration on tunnel-mac:

```
Switch# show l2protocol tunnel-dmac
Layer2 protocols tunnel destination MAC address is 0100.0ccd.cdd0
```

### Related Commands

None

## 3.12.8 l2protocol cos

### Command Purpose

Use this command to configure l2protocol cos globally.

### Command Syntax

l2protocol cos *COS_VALUE*

no l2protocol cos

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| COS_VALUE | vlan tag priority | 0-7 |

### Command Mode

Global Configuration

### Default

None

## Usage

Use this command to configure l2protocol cos globally, the default value is 0.

## Examples

This example shows how to configure l2protocol cos 7:

```
Switch# configure terminal
Switch(config)# l2protocol cos 7
```

## Related Commands

None

# 3.12.9 l2protocol full-mac

## Command Purpose

Use this command to configure l2 protocol mac address globally.

## Command Syntax

l2protocol full-mac *MAC*

no l2protocol full-mac

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MAC | Destination MAC address, including all MAC addresses | 0000.0000.0000 ~ FFFF.FFFF.FFFF |

## Command Mode

Global Configuration

## Default

None

## Usage

If the L2 protocol full-mac address coincides with BPDU, Slow proto, EAPOL or MAC<1-4>, the tunnel operation priority is orderly: BPDU, Slow proto, EAPOL, full-mac, mac<1-4>.

If the L2 protocol full-mac address coincides with L2 Protocol tunnel destination MAC address, the crossed L2 protocol mac address won't take effect when tunnel L2 Protocol

## Examples

This example shows how to configure l2 protocol full-mac address:

```
Switch# configure terminal
Switch(config)# l2protocol full-mac  0100.0CCC.CCCC
```

## Related Commands

l2protocol mac

# 3.12.10 l2protocol group-mac

## Command Purpose

Use this command to configure the multicast MAC address after replacing the destination MAC address of the Layer 2 protocol PDU.

## Command Syntax

l2protocol ( lldp | dot1x | stp | slow-proto | full-mac ) group-mac MAC

no l2protocol ( lldp | dot1x | stp | slow-proto | full-mac ) group-mac

l2protocol mac MACNUM group-mac MAC

no l2protocol mac MACNUM group-mac

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MACNUM | The configured MAC address index number. | <1~6> |

| | | |
|---|---|---|
| MAC | destination Multicast MAC address of the Layer 2 protocol PDU. | |

## Command Mode

Global Configuration

## Default

None

## Usage

When forwarding PDUs in L2PT, the destination MAC address of the PDU can be modified instead of adding a layer of encapsulation, using this name to replace the destination multicast MAC address specified in the protocol configuration. It is also possible to specify the destination multicast MAC address to be replaced by the destination MAC index of the original PDU.

## Examples

This example shows how to configure l2 protocol full-mac address:

```
Switch# configure terminal
Switch(config)# l2protocol stp group-mac 0100.0ccd.cdd0
```

## Related Commands

l2protocol replace

# 3.12.11 l2protocol replace

## Command Purpose

Specify the PDU on the interface that needs to be replaced with the destination MAC address (based on protocol type or MAC address).

## Command Syntax

l2protocol ( lldp | dot1x | stp | slow-proto |full-mac ) replace evc EVC_NAME

no l2protocol ( lldp | dot1x | stp | slow-proto | full-mac)

l2protocol mac MACNUM replace evc EVC_NAME

no l2protocol mac MACNUM

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| EVC_NAME | EVC name to be tunneled | |
| MACNUM | The configured MAC address index number. | <1~6> |

## Command Mode

Interface Configuration

## Default

None

## Usage

Enable L2PT destination MAC address replacement on the interface, while specifying the vlantag of the PDU after replacement.

## Examples

This example shows how to configure l2 protocol full-mac address:

```
Switch# configure terminal
Switch(config-if)# l2protocol stp replace evc evc1
```

## Related Commands

l2protocol group_mac

# 3.13 Storm Control Commands

## 3.13.1 port storm-control

### Command Purpose

Use the storm-control interface configuration command to enable broadcast, multicast, or unicast storm control and to set threshold levels on an interface. Use the no form of this command to return to the default setting.

### Command Syntax

storm-control ( broadcast | multicast | unicast ) ( level *LEVEL* | pps *PPS* )

no storm-control ( broadcast | multicast | unicast )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| broadcast | Enable broadcast storm control on the interface | - |
| multicast | Enable multicast storm control on the interface | - |
| unicast | Enable unicast storm control on the interface | - |
| level LEVEL | Specify the rising and falling suppression levels as a percentage of total bandwidth of the port. | 0.00-100.00 |
| pps PPS | Specify the rising and falling suppression levels as a rate in packets per second at which traffic is received on the port. | 0-1000000000 |

### Command Mode

Interface Configuration

### Default

Disabled

### Usage

This command can only be configured on switchport.

### Examples

This example shows how to configure storm-control broadcast on interface:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# storm-control broadcast level 30
```

This example shows how to disable storm-control broadcast on interface:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no storm-control broadcast
```

### Related Commands

show storm-control

## 3.13.2 vlan storm-control

### Command Purpose

Use the storm-control vlan configuration command to enable broadcast, multicast, or unicast storm control and to set threshold levels on an interface. Use the no form of this command to return to the default setting.

### Command Syntax

storm-control ( broadcast | multicast | unicast ) ( bandwidth <1-100000000> | pps <0-1000000000> )

no storm-control ( broadcast | multicast | unicast )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| broadcast | Enable broadcast storm control on the vlan | - |
| multicast | Enable multicast storm control on the vlan | - |
| unicast | Enable unicast storm control on the vlan | - |

| | | |
|---|---|---|
| bandwidth <1-100000000> | Specify the rising and falling suppression levels as a rate in bits per second at which traffic is received on the vlan. | 1-100000000 |
| pps <0-1000000000> | Specify the rising and falling suppression levels as a rate in packets per second at which traffic is received on the vlan. | 0-1000000000 |

## Command Mode

VLAN Configuration

## Default

Disabled

## Usage

This command can only be configured on vlan.

## Examples

This example shows how to configure storm-control broadcast on vlan:

```
Switch# configure terminal
Switch(config)# vlan 10
Switch(config-vlan)# storm-control broadcast bandwidth 3000
```

This example shows how to disable storm-control broadcast on vlan:

```
Switch# configure terminal
Switch(config)# vlan 10
Switch(config-vlan)# no storm-control broadcast
```

## Related Commands

show storm-control

## 3.13.3 ipg storm-control enable

### Command Purpose

Use the ipg storm-control enable to let storm control calculate IPG bytes. Use the no form of this command to return to the default setting.

### Command Syntax

ipg storm-control enable

no ipg storm-control enable

### Command Mode

Global Configuration

### Default

Disabled

### Usage

This command can be configured on global configure mode.

### Examples

This example shows how to configure storm-control to calculate IPG bytes:

```
Switch# configure terminal
Switch(config)# ipg storm-control enable
```

This example shows how to disable storm-control to calculate IPG bytes:

```
Switch# configure terminal
Switch(config)# no ipg storm-control enable
```

### Related Commands

None

## 3.13.4 show storm-control

### Command Purpose

Use this command to show storm-control configurations.

### Command Syntax

show storm-control ( interface *INTERFACE* | vlan <1-4094> | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| interface INTERFACE | Interface name | Support physical ports |
| vlan <1-4094> | VLAN ID | 1-4094 |

### Command Mode

Privileged EXEC

### Default

None

### Usage

This command displays the storm-control configurations.

### Examples

This example shows storm-control configurations:

```
Switch# show storm-control
```

This example shows storm-control configurations on interface eth-0-1:

```
Switch# show storm-control interface eth-0-1
```

### Related Commands

storm-control

## 3.13.5 show storm-control resource

### Command Purpose

Use this command to show storm-control resources.

### Command Syntax

show resource storm-control

### Command Mode

Privileged EXEC

### Default

None

### Usage

This command displays the storm-control resources.

### Examples

This example shows the overall resources and usage of storm control.:

```
Switch# show resource storm-control
```

### Related Commands

None

# 3.14 Loopback Detection Commands

## 3.14.1 loopback-detect enable

### Command Purpose

Using the loopback-detect enable command, you can enable loopback detection on an interface.

Using the no loopback-detect enable command, you can disable loopback detection on an interface. By default, loopback detection is disabled on an interface.

### Command Syntax

loopback-detect enable

no loopback-detect enable

### Command Mode

Interface Configuration

### Default

Disable

### Usage

The loopback-detect enable command enables loopback detection on an interface. This function enables the system to detect a loopback on the interface quickly and minimizes impact of the loopback on the entire network. After loopback detection is enabled on an interface, the interface sends loopback detection packets at intervals. Loopback detection occupies CPU resources; therefore, disable this function when it is not required.

### Examples

This example shows how to enable loopback detect on port eth-0-1:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# loopback-detect enable
```

### Related Commands

show loopback-detect

## 3.14.2 loopback-detect packet-interval

### Command Purpose

Using the loopback-detect packet-interval command, you can set the interval for sending loopback detection packets on all interfaces.

Using the no loopback-detect packet-interval command, you can restore the default interval for sending loopback detection packets on all interfaces.

By default, the interval for sending loopback detection packets is 5s

### Command Syntax

loopback-detect packet-interval *INTERVAL*

no loopback-detect packet-interval

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INTERVAL | loopback detect packet send interval | 1-300, unit:second |

### Command Mode

Global Configuration

### Default

5 seconds

### Usage

The loopback-detect packet-interval command is used to adjust the interval for sending loopback detection packets. After loopback detection is enabled on an

interface, the interface sends loopback detection packets at the interval specified by the loopback-detect packet-interval command. If a shorter interval is set, the system sends more loopback detection packets in a certain period. This enables the system to detect loopbacks more quickly and accurately, but more system sources are consumed.

### Examples

This example shows how to set the interval for sending loopback detection packets to 10s:

```
Switch# configure terminal
Switch(config)# loopback-detect packet-interval 10
```

### Related Commands

show loopback-detect

## 3.14.3 loopback-detect recovery-time

### Command Purpose

Using the loopback-detect recovery-time command, you can set the time for interface recovery from abnormal status.

Using the no loopback-detect recovery-time command, you can restore the default time.

By default, the value for recovery time is the packet-interval * 3

### Command Syntax

loopback-detect recovery-time *TIME*

no loopback-detect recovery-time

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| TIME | recovery time in seconds | 1-255, unit:second |

### Command Mode

Interface Configuration

### Default

recovery-time is packet-interval * 3

### Usage

If the interface is shutdown, this command is useless.

### Examples

This example shows how to set the value for recoverying time to 10s:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# loopback-detect recovery-time 10
```

### Related Commands

show loopback-detect

## 3.14.4 loopback-detect delay-time

### Command Purpose

Using the loopback-detect delay-time on interface for set aciton.

Using the no loopback-detect delay-time to set not delay.

### Command Syntax

loopback-detect delay-time *TIME*

no loopback-detect delay-time

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| TIME | delay time | 1-255, unit:second |

### Command Mode

Interface Configuration

## Default

None

## Usage

The no loopback-detect delay-time command is used to set on the interface, if received loopback-detect packet, then set action that set on the interface.

## Examples

This example shows how to set the value for delay time set action to 5s:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# loopback-detect delay-time 5
```

## Related Commands

show loopback-detect

# 3.14.5 loopback-detect action

## Command Purpose

Using the loopback-detect action command, you can configure an action to perform when a loopback is detected on an interface.

Using the no loopback-detect action command, you can restore the default action.

By default, an interface is blocked when a loopback is detected on the interface.

## Command Syntax

loopback-detect action { shutdown | trap | block }

no loopback-detect action

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| shutdown | Shuts down an interface when a loopback is detected on the interface. | - |

| | | |
|---|---|---|
| Trap | Only sends a trap message when a loopback is detected. | - |
| block | Block the interface and continue to send loopback-detect packets | - |

## Command Mode

Interface Configuration

## Default

Trap

## Usage

After loopback detection is enabled on an interface, the interface sends loopback detection packets at intervals. When a loopback is detected on the interface, the system performs an action to minimize the impact on the entire network. The loopback-detect action command configures the action.

## Examples

This example shows how to configure the system action to shutdown interface eth-0-1 when a loopback occurs:

```
Switch# configure terminal
Switch(config)#interface eth-0-1
Switch(config-if)# loopback-detect action shutdown
```

## Related Commands

show loopback-detect

loopback-detect enable

## 3.14.6 loopback-detect packet vlan

### Command Purpose

Using the loopback-detect packet vlan command, you can specify the VLAN IDs of loopback detection packets on an interface.

Using the no loopback-detect packet vlan command, you can cancel the configuration.

By default, detection packets do not have a VLAN ID.

### Command Syntax

loopback-detect packet vlan *VID*

no loopback-detect packet vlan *VID*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VID | VLAN ID | 1-4094 |

### Command Mode

Interface Configuration

### Default

No vlan id.

### Usage

By default, loopback detection packets do not contain VLAN IDs. After the loopback-detect packet vlan command is executed on an interface, the interface sends an untagged loopback detection packet and the loopback detection packets with the specified VLAN tags. The specified VLANs exist and the interface has been added to the VLANs in tagged mode. If you run the loopback-detect packet vlan command multiple times in the same interface view, multiple VLAN IDs are specified.

You can specify a maximum of eight VLAN IDs

## Examples

This example shows how to set the VLAN ID of loopback detection packets sent by interface eth-0-1 to 30:

```
Switch# configure terminal
Switch(config)#interface eth-0-1
Switch(config-if)# loopback-detect packet vlan 30
```

## Related Commands

show running-config

# 3.14.7 show loopback-detect

## Command Purpose

Using the show loopback-detect command, you can view the loopback detection configuration and status of loopback detection enabled interfaces.

## Command Syntax

show loopback-detect { interface *IFNAME* | packet-interval }

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| interface IFNAME | Show loopback detection status and configuration on interface. | Support physical ports |
| packet-interval | Show loopabck detect packet interval. | - |

## Command Mode

Privileged EXEC

## Default

None

### Usage

This command is used to check the loopback detection configuration and status of each interface on which loopback detection is enabled.

### Examples

Display the loopback detection configuration and status of loopback detection enabled interfaces:

```
Switch# show loopback-detect

Loopback detection packet interval(second) 5
Interface   Action   Status   Delay(s) DLeft(s) Recovery(s) RLeft(s) Send
Recv               Count
eth-0-47    trap     NORMAL   30       -        15          -        N/A
N/A                0
eth-0-48    trap     NORMAL   -        -        15          -        2001-01-05
034721 N/A               0
```

### Related Commands

loopback-detect action

loopback-detect enable

## 3.15 MLAG Commands

### 3.15.1 mlag configuration

### Command Purpose

The mlag configuration command enters MLAG configuration mode to configure Multichassis Link Aggregation (MLAG) features.

The no mlag configuration command removes all MLAG configuration command from running-config.

### Command Syntax

mlag configuration

no mlag configuration

## Command Mode

Global Configuration

## Default

None

## Usage

The mlag configuration command enters MLAG configuration mode to configure Multichassis Link Aggregation (MLAG) features. The exit command does not affect the configuration. The no mlag configuration command removes all MLAG configuration command from running-config.

## Examples

This example shows how to enter MLAG configuration mode:

```
Switch# configure terminal
Switch(config)# mlag configuration
```

## Related Commands

show mlag

# 3.15.2 priority

## Command Purpose

The priority command specifies the priority for MLAG local device.

The no priority command removes the MLAG local device priority by deleting the priority command from running-config.

## Command Syntax

priority *PRIORITY_VALUE*

no priority

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PRIORITY_VALUE | MLAG device priority | 1-254 |

## Command Mode

MLAG Configuration

## Default

None

## Usage

The priority command specifies the MLAG device priority.MLAG select master and slave with priority.

## Examples

This example shows how to specify the Mlag device priority.

```
Switch# configure terminal

Switch(config)# mlag configuration
Switch(config-mlag)#priority 100
Switch(config-mlag)#
```

## Related Commands

show mlag

# 3.15.3 peer-address

## Command Purpose

The peer-address command specifies the peer IPv4 address for a MLAG domain.

The no peer-address command removes the MLAG peer's IPv4 address assignment by deleting the peer-address command from running-config.

## Command Syntax

peer-address *IP_ADDR*

no peer-address

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IP_ADDR | MLAG peer IPv4 address | IPv4 Address |

## Command Mode

MLAG Configuration

## Default

None

## Usage

The peer-address command specifies the peer IPv4 address for a MLAG domain. MLAG control traffic is sent to the peer IPv4 address.

The no peer-address command removes the MLAG peer's IPv4 address assignment by deleting the peer-address command from running-config.

## Examples

This example shows how to specify the peer IPv4 address for a MLAG domain:

```
Switch# configure terminal
Switch(config)# mlag configuration
Switch(config-mlag)# peer-address 12.1.1.2
Switch(config-mlag)#
```

## Related Commands

show mlag peer

# 3.15.4 peer-link

## Command Purpose

The peer-link command specifies the interface that connects MLAG peers.

The no peer-link command removes the peer link by deleting the peer-link command from running-config

## Command Syntax

peer-link *IFNAME*

no peer-link

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | Interface for peer link. | Only support phy port or agg port |

## Command Mode

MLAG Configuration

## Default

None

## Usage

The peer-link command specifies the interface that connects MLAG peers. To form an MLAG, two switches are connected through an interface called a apeer link. The peer link carries control and data traffic between the two switches.

The no peer-link command removes the peer link by deleting the peer-link command from running-config.

## Examples

This example shows how to specify the interface that connects MLAG peers:

```
Switch# configure terminal
Switch(config)# mlag configuration
Switch(config-mlag)# peer-link eth-0-9
Switch(config-mlag)#
```

## Related Commands

show mlag

## 3.15.5 timers mlag

### Command Purpose

The timers mlag command specifies the keepalive interval and holdtime timers.

The no timers mlag command removes the specified timer and returns it to default value.

### Command Syntax

timers mlag keepalive holdtime

no timers mlag

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| keepalive | keepalive time interval | 1-65535, unit:second |
| holdtime | holdtime time interval | 4-65535, unit:second |

### Command Mode

MLAG Configuration

### Default

Default keepalive interval is 1 seconds and default holdtime is 5 seconds.

### Usage

The timers mlag command specifies the keepalive interval and holdtime timers. It will be take effective by next time when the peer goes to established. Between the locally configured keepalive timer and the calculated value by the remote holdtime/4 carried in open message, system uses the smaller one in actual calculation.

The no timers mlag command removes the specified timer and returns it to default value.

### Examples

This example shows how to specify the keeepalive interval and holdtime timers:

```
Switch# configure terminal
Switch(config)# mlag configuration
Switch(config-mlag)# timers mlag 10 100
Switch(config-mlag)#
```

### Related Commands

show mlag peer

## 3.15.6 reload-delay

### Command Purpose

The reload-delay command specifies the period that non-peer links are disabled after an MLAG peer reboots.

The no reload-delay command restores the default value of 300 by deleting the reload-delay mlag statement from running-config.

### Command Syntax

reload-delay ( auto | period )

no reload-delay

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| period | Disable link interval. The number 0 means that interface not enter into errdisable | 0-86400, unit:second |
| auto | Auto recovery from errdisable after MLAG peer build successful. | - |

### Command Mode

MLAG Configuration

### Default

300 seconds.

### Usage

When an MLAG peer reboots, all ports except those in peer-link port-channel remain in errdisabled state for a specified period. This period allows all topology states to stabilize before the switch begins forwarding traffic. The specified period is configured by this command.

### Examples

This example shows how to specify the dealy interval:

```
Switch# configure terminal
Switch(config)# mlag configuration
Switch(config-mlag)# reload-delay 100
Switch(config-mlag)#
```

### Related Commands

show mlag

## 3.15.7 sync-orphan

### Command Purpose

The sync-orphan command specifies the mlag peers to sync MAC entries on orphan port.

The no sync-orphan command disable the function.

### Command Syntax

sync-orphan

no sync-orphan

### Command Mode

MLAG Configuration

### Default

Enable

### Usage

If this function is disabled，MLAG peers will only sync those MAC entries in MLAG group.

### Examples

This example shows how to specify the mlag peers to sync MAC entries on orphan port:

```
Switch# configure terminal
Switch(config)# mlag configuration
Switch(config-mlag)# sync-orphan
Switch(config-mlag)#
```

### Related Commands

show mlag

## 3.15.8 sync-overlay

### Command Purpose

The sync-overlay command specifies the mlag peers to sync MAC entries on overlay logic port.

The no sync-overlay command disable the function.

### Command Syntax

sync-overlay

no sync-overlay

### Command Mode

MLAG Configuration

### Default

Enable

## Usage

If this function is disabled, MLAG peers will only sync those MAC entries in MLAG group.

## Examples

This example shows how to specify the mlag peers to sync MAC entries on overlay logic ports:

```
Switch# configure terminal
Switch(config)# mlag configuration
Switch(config-mlag)# sync-overlay
Switch(config-mlag)#
```

## Related Commands

show mlag

# 3.15.9 dual-active-detection source peer

## Command Purpose

The dual-active-detection source peer command specifies the source ip address and peer ip address for mlag dad.

## Command Syntax

dual-active-detection source *A.B.C.D* ( vrf *NAME* | ) peer *A.B.C.D* ( udp-port <1025-2048> | ) ( timeout <3-60> | )

no dual-active-detection source peer

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| source A.B.C.D | Source IP address for mlag dad | IPv4 Address |
| vrf NAME | Vrf NAME for mlag dad | A string up to 31 characters |
| peer A.B.C.D | Peer IP address for mlag dad | IPv4 Address |
| udp-port <1025-2048> | Udp port for mlag dad | 1025-2048, default 1025 |

| | | |
|---|---|---|
| timeout <3-60> | Timeout value for mlag dad | 3-60 seconds, default 3 seconds |

## Command Mode

MLAG Configuration

## Default

None

## Usage

Use this command to configure dual-active-detection source ip address, peer ip address, vrf name, udp port and timeout value.

## Examples

This example shows how to specify the mlag dad source ip address and peer ip address

```
Switch# configure terminal
Switch(config)# mlag configuration
Switch(config-mlag)# dual-active-detection source 12.1.1.1 peer 12.1.1.2
Switch(config-mlag)#
```

## Related Commands

show mlag dad

# 3.15.10 dual-active-detection reserved interface

## Command Purpose

The dual-active-detection reserved interface command specifies the reserved interface for mlag dad

## Command Syntax

dual-active-detection reserved interface ( *IFPHYSICAL* | *IFAGG* )

no dual-active-detection reserved interface ( *IFPHYSICAL* | *IFAGG* )

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| IFPHYSICAL\|IFAGG | Reserved interface for mlag dad | physical interface or agg interface |

## Command Mode

MLAG Configuration

## Default

None

## Usage

Use this command to configure dual-active-detection reserved interface.

## Examples

This example shows how to specify the mlag dad reserved interface

```
Switch# configure terminal
Switch(config)# mlag configuration
Switch(config-mlag)# dual-active-detection reserved interface eth-0-1
Switch(config-mlag)#
```

## Related Commands

show mlag dad

# 3.15.11 dual-active-detection updelay

## Command Purpose

The dual-active-detection updelay command specifies the updelay time for mlag dad

## Command Syntax

dual-active-detection updelay <0-3600>

no dual-active-detection updelay

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| <0-3600> | Updelay time value for mlag dad | 0-3600 seconds, default 300 seconds |

### Command Mode

MLAG Configuration

### Default

None

### Usage

Use this command to configure dual-active-dectection updelay time.

### Examples

This example shows how to specify the mlag dad updelay time

```
Switch# configure terminal
Switch(config)# mlag configuration
Switch(config-mlag)# dual-active-detection updelay 10
Switch(config-mlag)#
```

### Related Commands

show mlag dad

## 3.15.12 lacp-system-id switch-delay

### Command Purpose

The lacp-system-id switch-delay command specifies the switch-delay time for lacp when mlag peer disconnected

### Command Syntax

lacp-system-id switch-delay <0-3600>

no lacp-system-id switch-delay

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| <0-3600> | Switch-delay time for lacp | 0-3600 seconds, 0 for never switch, default switch immediately |

## Command Mode

MLAG Configuration

## Default

None

## Usage

Use this command to configure lacp system-id switch-delay time when mlag peer disconnected.

## Examples

This example shows how to specify the lacp system-id switch-delay time

```
Switch# configure terminal
Switch(config)# mlag configuration
Switch(config-mlag)# lacp-system-id switch-delay 20
Switch(config-mlag)#
```

## Related Commands

N/A

# 3.15.13 mlag

## Command Purpose

The mlag command assigns an MLAG ID to a port-channel.

The no mlag command removes the MLAG ID assignment from the configuration mode interface by deleting the corresponding mlag command from running-config.

## Command Syntax

mlag *MLAGID*

no mlag

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MLAGID | Number used as MLAG ID. | 1-63 |

## Command Mode

Interface Configuration

## Default

None

## Usage

The mlag command assigns an MLAG ID to a port-channel. MLAG peer switches form an MLAG when each switch configures the same MLAG ID to a port-channel interface. Only one MLAG ID can be assigned to an interface. An individual MLAG number cannot be assigned to more than one interface.

The no mlag command removes the MLAG ID assignment from the configuration mode interface by deleting the corresponding mlag command from running-config.

## Examples

This example shows how to assigns an MLAG ID to a port-channel:

```
Switch# configure terminal
Switch(config)# interface agg1
Switch(config-if)# mlag 1
```

## Related Commands

show mlag interface

## 3.15.14 clear mlag count

### Command Purpose

The clear mlag count command clears mlag count information.

### Command Syntax

clear mlag count

### Command Mode

Privileged EXEC

### Default

None

### Usage

Use this command to clear mlag count information which can be displayed by show mlag peer command.

### Examples

This example shows how to clear mlag count information and display information about the MLAG peer:

```
Switch# clear mlag count
Switch# show mlag peer

MLAG neighbor is 12112, MLAG version 1
MLAG state = Established, up for 000039
Last read 000015, hold time is 240, keepalive interval is 60 seconds
Received 0 messages,Sent 0 messages
Open       received 0, sent 0
KAlive     received 0, sent 0
Fdb sync   received 0, sent 0
Failover   received 0, sent 0
Conf       received 0, sent 0
Syspri     received 0, sent 0
Peer fdb   received 0, sent 0
STP Total  received 0, sent 0
 Global    received 0, sent 0
```

```
 Packet   received 0, sent 0
 Instance received 0, sent 0
 State    received 0, sent 0
Connections established 1; dropped 0
Local host 12111, Local port 61000
Foreign host 12112, Foreign port 37335
remote_sysid 0ecb30301100
```

### Related Commands

show mlag peer

## 3.15.15 show mlag

### Command Purpose

The show mlag command displays information about the MLAG configuration.

### Command Syntax

show mlag

### Command Mode

Privileged EXEC

### Default

None

### Usage

Use this command to display information about the MLAG configuration.

### Examples

This example shows how to display information about the MLAG configuration:

```
Switch# show mlag

MLAG configuration
------------------
role          Master
local_sysid   001e080a6fca
```

```
remote_sysid  000000000000
mlag_sysid    001e080a6fca
local_syspri  32768
remote_syspri 0
mlag_syspri   32768
peer-link     -
peer conf     No
reload-delay  300
```

### Related Commands

mlag configuration

## 3.15.16 show mlag peer

### Command Purpose

The show mlag peer command displays information about the MLAG peer.

### Command Syntax

show mlag peer ( vlan-if | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| vlan-if | Vlan interface information | - |

### Command Mode

Privileged EXEC

### Default

None

### Usage

Use this command to display information about the MLAG peer.

### Examples

This example shows how to display information about the MLAG peer:

```
Switch# show mlag peer
MLAG neighbor is 12112, MLAG version 1
MLAG state = Established, up for 4d02h14m
Last read 000029, hold time is 240, keepalive interval is 60 seconds
Received 6835 messages,Sent 7185 messages
Open       received 1, sent 2
KAlive     received 6831, sent 6830
Fdb sync   received 0, sent 0
Failover   received 0, sent 87
Conf       received 1, sent 1
STP Total  received 2, sent 265
 Global    received 2, sent 3
 Packet    received 0, sent 0
 Instance  received 0, sent 0
 State     received 0, sent 262
Connections established 1; dropped 0
Local host 12111, Local port 61000
Foreign host 12112, Foreign port 34283
remote_sysid 5e266a03d400
```

### Related Commands

peer-address

## 3.15.17 show mlag interface

### Command Purpose

The show mlag interface command displays information about the MLAG interface.

### Command Syntax

show mlag interface ( *MLAGID* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MLAGID | Number used as MLAG ID. | 1-63 |

### Command Mode

Privileged EXEC

### Default

None

### Usage

Use this command to display information about the MLAG interface.

### Examples

This example shows how to display information about the MLAG interface:

```
Switch# show mlag interface

mlagid  local-if  local-state    remote-state
1       agg1      up             up
2       agg2      up             up
```

### Related Commands

mlag MLAGID

## 3.15.18 show mlag dad

### Command Purpose

The show mlag dad command displays information about the MLAG Dual-active-detection.

### Command Syntax

show mlag dad

### Command Mode

Privileged EXEC

### Default

None

### Usage

Use this command to display information about the MLAG DAD.

### Examples

This example shows how to display information about the MLAG DAD

```
Switch# show mlag dad
MLAG DAD:
---------------------------
status         : UP
src ip         : 192.168.1.2
peer ip        : 192.168.1.1
vrf            : -
mgmt-if        : TRUE
udp port       : 1025
interval       : 1
timeout        : 3
updelay        : 300
receive        : ON
send           : ON
HB src ip      : 192.168.1.1
HB peer ip     : 192.168.1.2
HB mac         : d85b.2212.0a6d
HB priority    : 200
HB role        : Slave
DAD occur      : No
Switch#
```

### Related Commands

dual-active-detection source

## 3.16 Hash load-banlance Commands

### 3.16.1 hash field

#### Command Purpose

Use this command to set hash field or create a new hash field, and enter hash field configure view;use the no command to delete user-defined hash field.

#### Command Syntax

hash-field ( port-channel | ecmp | *NAME* )

no hash-field *NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| port-channel | Port-channel of system default hash field | - |
| ecmp | Ecmp of system default hash field | - |
| NAME | Hash field name string | The initial character of name should be a-z, A-Z, or 0-9, character only can be 0-9A-Za-z.-_ and the max length is 64 |

## Command Mode

Global Configuration

## Default

port-channel，ecmp

## Usage

The system support the max number of hash field is 4, including 2 system default hash fields named port-channel and ecmp and 2 user-defined hash fields.when applied to the hash value,it can't be deleted.

## Examples

The following example shows how to create a new hash field named user:

```
Switch# configure terminal
Switch(config)# hash-field user
Switch(config-hash-field)#
```

The following example shows how to delete the user-defined hash field named user:

```
Switch# configure terminal
Switch(config)# no hash-field user
```

## Related Commands

show hash-field

## 3.16.2 l2

### Command Purpose

Use this command to set l2 packet hash field; use the no command to set the l2 packet field to default.

### Command Syntax

l2 ( macda | macsa | vlan | eth-type | src-interface )

no l2

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| macda | MAC Destination Address | - |
| macsa | MAC Source Address | - |
| vlan | Vlan | - |
| eth-type | Ethernet Type | - |
| src-interface | Source Interface | - |

### Command Mode

Config-hash-field

### Default

l2 macsa macda

### Usage

None

### Examples

The following example shows how to select macsa for l2 packet load balance in port-channel:

```
Switch# configure terminal
Switch(config)# hash-field port-channel
Switch(config-hash-field)# l2 macsa
```

The following example shows how to select default l2 packet load balance in port-channel:

```
Switch# configure terminal
Switch(config)# hash-field port-channel
Switch(config-hash-field)# no l2
```

## Related Commands

show hash-field

# 3.16.3 ip

## Command Purpose

Use this command to set ip packet hash field; use the no command to set the ip packet field to default.

## Command Syntax

ip ( ipda | ipsa | ip-protocol | sourceport | destport | src-interface )

no ip

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ipda | IP Destination Address | - |
| ipsa | IP Source Address | - |
| ip-protocol | IP Header protocol | - |
| sourceport | Layer4 Source Port | - |
| destport | Layer4 Destination Port | - |
| src-interface | Source Interface | - |

## Command Mode

Config-hash-field

## Default

ip ipsa ipda sourceport destport ip-protocol

## Usage

None

## Examples

The following example shows how to select ipsa for ip packet load balance in port-channel:

```
Switch# configure terminal
Switch(config)# hash-field port-channel
Switch(config-hash-field)# ip ipsa
```

The following example shows how to select default ip packet load balance in port-channel:

```
Switch# configure terminal
Switch(config)# hash-field port-channel
Switch(config-hash-field)# no ip
```

## Related Commands

show hash-field

# 3.16.4 ipv6

## Command Purpose

Use this command to set ipv6 packet hash field; use the no command to set the ipv6 field to default.

## Command Syntax

ipv6 ( ipda | ipsa | ip-protocol | sourceport | destport | src-interface )

no ipv6

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ipda | IP Destination Address | - |
| ipsa | IP Source Address | - |
| ip-protocol | IP Header protocol | - |
| sourceport | Layer4 Source Port | - |
| destport | Layer4 Destination Port | - |

| | | |
|---|---|---|
| src-interface | Source Interface | - |

## Command Mode

Config-hash-field

## Default

ipv6 ipsa ipda sourceport destport ip-protocol

## Usage

Only when the system is in ipv6 mode, the ipv6 packet hash field can work normally.

## Examples

The following example shows how to select ipsa for ipv6 packet load balance in port-channel:

```
Switch# configure terminal
Switch(config)# hash-field port-channel
Switch(config-hash-field)# ipv6 ipsa
```

The following example shows how to select default ipv6 packet load balance in port-channel:

```
Switch# configure terminal
Switch(config)# hash-field port-channel
Switch(config-hash-field)# no ipv6
```

## Related Commands

show hash-field

# 3.16.5 vxlan

## Command Purpose

Use this command to set vxlan packet hash field.

To return the configuration to default value use the no form of this command.

## Command Syntax

vxlan { vni | src-interface }

vxlan ( { vni | src-interface } | ) outer { ipsa | ipda | sourceport | destport | vlan }

vxlan ( { vni | src-interface } | ) inner-layer2 { macsa | macda | eth-type }

vxlan ( { vni | src-interface } | ) inner-layer3 { ipsa | ipda | sourceport | destport | ip-protocol }

no vxlan

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| vni | VXLAN VNI | - |
| src-interface | Source Interface | - |
| outer ipsa | Outer header's IP Source Address | - |
| outer ipda | Outer header's IP Destination Address | - |
| outer sourceport | Outer header's Layer4 Source Port | - |
| outer destport | Outer header's Layer4 Destination Port | - |
| outer vlan | Outer header's Vlan ID | - |
| inner macsa | Inner header's MAC Source Address | - |
| inner macda | Inner header's MAC Destination Address | - |
| inner eth-type | Inner header's Ethernet Type | - |
| inner ipsa | Inner header's IP Source Address | - |
| inner ipda | Inner header's IP Destination Address | - |
| inner sourceport | Inner header's Layer4 Source Port | - |
| inner destport | Inner header's Layer4 Destination Port | - |
| inner ip-protocol | Inner header's IP Header protocol | - |

## Command Mode

Config-hash-field

## Default

vxlan vni outer ipsa ipda sourceport

## Usage

Outer configuration and inner configuration cannot take effect at the same time.

## Examples

The following example shows how to select outer ipsa and vni for vxlan packet load balance in port-channel:

```
Switch# configure terminal
Switch(config)# hash-field port-channel
Switch(config-hash-field)# vxlan vni outer ipda
```

The following example shows how to select default vxlan packet load balance in port-channel:

```
Switch# configure terminal
Switch(config)# hash-field port-channel
Switch(config-hash-field)# no vxlan
```

## Related Commands

show hash-field

# 3.16.6 nvgre

## Command Purpose

Use this command to set nvgre packet hash field.

To return the configuration to default value use the no form of this command.

## Command Syntax

nvgre { vsid | src-interface }

nvgre ( { vsid | src-interface } | ) outer { ipsa | ipda }

nvgre ( { vsid | src-interface } | ) inner-layer2 { macsa | macda | eth-type }

nvgre ( { vsid | src-interface } | ) inner-layer3 { ipsa | ipda | sourceport | destport | ip-protocol }

no nvgre

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| vsid | NVGRE VSID | - |
| src-interface | Source Interface | - |
| outer ipsa | Outer header's IP Source Address | - |
| outer ipda | Outer header's IP Destination Address | - |
| inner macsa | Inner header's MAC Source Address | - |
| inner macda | Inner header's MAC Destination Address | - |
| inner eth-type | Inner header's Ethernet Type | - |
| inner ipsa | Inner header's IP Source Address | - |
| inner ipda | Inner header's IP Destination Address | - |
| inner sourceport | Inner header's Layer4 Source Port | - |
| inner destport | Inner header's Layer4 Destination Port | - |
| inner ip-protocol | Inner header's IP Header protocol | - |
| top-label | Mpls Top Lable | - |

## Command Mode

Config-hash-field

## Default

nvgre vsid outer ipsa ipda

## Usage

Outer configuration and inner configuration cannot take effect at the same time.

## Examples

The following example shows how to select outer ipsa and vsid for nvgre packet load balance in port-channel:

```
Switch# configure terminal
Switch(config)# hash-field port-channel
Switch(config-hash-field)# nvgre vsid outer ipda
```

The following example shows how to select default nvgre packet load balance in port-channel:

```
Switch# configure terminal
Switch(config)# hash-field port-channel
Switch(config-hash-field)# no nvgre
```

## Related Commands

show hash-field

# 3.16.7 mpls

## Command Purpose

Use this command to set mpls packet hash field.

To return the configuration to default value use the no form of this command.

## Command Syntax

mpls { top-label | 2nd-label | 3rd-label | src-interface }

mpls ( { top-label | 2nd-label | 3rd-label | src-interface } | ) inner { ipsa | ipda }

no mpls

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| 2nd-label | Mpls Second Lable | - |
| 3rd-label | Mpls Third Lable | - |
| src-interface | Source Interface | - |
| inner ipsa | Inner header's IP Source Address | - |
| inner ipda | Inner header's IP Destination Address | - |
| top-label | Mpls Top Lable | - |

## Command Mode

Config-hash-field

## Default

mpls top-label 2nd-label

## Usage

None

## Examples

The following example shows how to select inner ipsa and top-label for mpls packet load balance in port-channel:

```
Switch# configure terminal
Switch(config)# hash-field port-channel
Switch(config-hash-field)# mpls top-label inner ipsa
```

The following example shows how to select default mpls packet load balance in port-channel:

```
Switch# configure terminal
Switch(config)# hash-field port-channel
Switch(config-hash-field)# no mpls
```

## Related Commands

show hash-field

# 3.16.8 vpws

## Command Purpose

Use this command to set vpws packet hash field.

To return the configuration to default value use the no form of this command.

## Command Syntax

vpws { top-label | 2nd-label | 3rd-label | src-interface }

no vpws

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| 2nd-label | Mpls Second Lable | - |
| 3rd-label | Mpls Third Lable | - |
| src-interface | Source Interface | - |
| src-interface | Source Interface | - |

## Command Mode

Config-hash-field

## Default

vpws top-label 2nd-label

## Usage

None

## Examples

The following example shows how to select top-label for vpws packet load balance in port-channel:

```
Switch# configure terminal
Switch(config)# hash-field port-channel
Switch(config-hash-field)# vpws top-label
```

The following example shows how to select default vpws packet load balance in port-channel:

```
Switch# configure terminal
Switch(config)# hash-field port-channel
Switch(config-hash-field)# no vpws
```

## Related Commands

show hash-field

## 3.16.9 vpls

### Command Purpose

Use this command to set vpls packet hash field.

To return the configuration to default value use the no form of this command.

### Command Syntax

vpls src-interface

vpls ( src-interface | ) inner-layer2 { macsa | macda | vlan | eth-type }

vpls ( src-interface | ) inner-layer3 { ipsa | ipda | sourceport | destport | ip-protocol }

no vpls

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| inner macsa | Inner header's MAC Source Address | - |
| inner macda | Inner header's MAC Destination Address | - |
| inner vlan | Inner header's Vlan ID | - |
| inner eth-type | Inner header's Ethernet Type | - |
| inner ipsa | Inner header's IP Source Address | - |
| inner ipsa | Inner header's IP Destination Address | - |
| inner sourceport | Inner header's Layer4 Source Port | - |
| inner destport | Inner header's Layer4 Destination Port | - |
| inner ip-protocol | Inner header's IP Header protocol | - |
| top-label | Mpls Top Lable | - |

### Command Mode

Config-hash-field

### Default

vpls inner-layer2 macsa macda

vpls inner-layer3 ipsa ipda

### Usage

Inner layer2 configuration and layer3 configuration can take effect at the same time.

### Examples

The following example shows how to select src-interface and inner macsa for vpls packet load balance in port-channel:

```
Switch# configure terminal
Switch(config)# hash-field port-channel
Switch(config-hash-field)# vpls src-interface inner-layer2 macsa
```

The following example shows how to select default vpls packet load balance in port-channel:

```
Switch# configure terminal
Switch(config)# hash-field port-channel
Switch(config-hash-field)# no vpls
```

### Related Commands

show hash-field

## 3.16.10 l3vpn

### Command Purpose

Use this command to set l3vpn packet hash field.

To return the configuration to default value use the no form of this command.

### Command Syntax

l3vpn src-interface

l3vpn ( src-interface | ) inner { ipsa | ipda | sourceport | destport | ip-protocol }

no l3vpn

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| 2nd-label | Mpls Second Lable | - |
| 3rd-label | Mpls Third Lable | - |
| src-interface | Source Interface | - |
| inner ipsa | Inner header's IP Source Address | - |
| inner ipda | Inner header's IP Destination Address | - |
| inner sourceport | Inner header's Layer4 Source Port | - |
| inner destport | Inner header's Layer4 Destination Port | - |
| inner ip-protocol | Inner header's IP Header protocol | - |

## Command Mode

Config-hash-field

## Default

l3vpn inner ipsa ipda sourceport destport ip-protocol

## Usage

None

## Examples

The following example shows how to select src-interface and inner ipsa for l3vpn packet load balance in port-channel:

```
Switch# configure terminal
Switch(config)# hash-field port-channel
Switch(config-hash-field)# l3vpn src-interface inner ipsa
```

## Related Commands

show hash-field

## 3.16.11 disable control

### Command Purpose

Use this command to force ip packet ,ipv6 packet or mpls packet to follow l2 hash configuration.

To return the configuration to default value use the no form of this command.

### Command Syntax

ip disable

no ip disable

ipv6 disable

no ipv6 disable

mpls disable

no mpls disable

### Command Mode

Config-hash-field

### Default

no ip disable

no ipv6 disable

no mpls disable

### Usage

None

### Examples

The following example shows how to not select ipv6 packet field to hash in port-channel:

```
Switch# configure terminal
Switch(config)# hash-field port-channel
Switch(config-hash-field)#  ipv6 disable
```

The following example shows how to select ipv6 packet field to hash in port-channel:

```
Switch# configure terminal
Switch(config)# hash-field port-channel
Switch(config-hash-field)#  no ipv6 disable
```

### Related Commands

show hash-field

## 3.16.12 ipv6 address compress

### Command Purpose

Use this command to change ipv6 packet 's IP address compressing mode.

To return the configuration to default value use the no form of this command.

### Command Syntax

ipv6 address compress mode ( xor | lsb )

no ipv6 address compress mode

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| xor | Xor Compressing Mode | - |
| lsb | Lsb Compressing Mode | - |

### Command Mode

Config-hash-field

### Default

ipv6 address compress mode xor

### Usage

None

## Examples

The following example shows how to set ipv6 address comprssing mode to lsb:

```
Switch# configure terminal
Switch(config)# hash-field port-channel
Switch(config-hash-field)# ipv6 address compress mode lsb
```

The following example shows how to set ipv6 address comprssing mode to default:

```
Switch# configure terminal
Switch(config)# hash-field port-channel
Switch(config-hash-field)# no ipv6 address compress mode
```

## Related Commands

show hash-field

# 3.16.13 hash seed

## Command Purpose

Use this command to set hash seed.

To return the configuration to default value use the no form of this command.

## Command Syntax

seed ( <0-4294967295> | router-id | random )

no seed

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| <0-4294967295> | User Define | - |
| router-id | Use Router-id As Hash Seed | - |
| random | Random Value | - |

## Command Mode

Config-hash-field

## Default

seed 0

## Usage

None

## Examples

The following example shows how to use router-id as hash seed:

```
Switch# configure terminal
Switch(config)# hash-field port-channel
Switch(config-hash-field)# seed router-id
```

The following example shows how to set hash seed to default:

```
Switch# configure terminal
Switch(config)# hash-field port-channel
Switch(config-hash-field)# no seed
```

## Related Commands

show hash-field

# 3.16.14 hash arithmetic

## Command Purpose

Use this command to set hash arithmetic.

To return the configuration to default value use the no form of this command.

## Command Syntax

hash-arithmetic ( xor | crc )

no hash-arithmetic

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| xor | Exclusive or arithmetic | - |
| crc | Cyclical redundancy check arithmetic | - |

## Command Mode

Config-hash-field

### Default

hash-arithmetic xor

### Usage

None

### Examples

The following example shows how to set crc hash arithmetic in port-channel:

```
Switch# configure terminal
Switch(config)# hash-field port-channel
Switch(config-hash-field)# hash-arithmetic crc
```

The following example shows how set default hash arithmetic in port-channel:

```
Switch# configure terminal
Switch(config)# hash-field port-channel
Switch(config-hash-field)# no hash-arithmetic
```

### Related Commands

show hash-field

## 3.16.15 hash symmetry

### Command Purpose

Use this command to enable hash symmetry function.

To return the configuration to default value use the no form of this command.

### Command Syntax

mode symmetry

no mode symmetry

### Command Mode

Config-hash-field

## Default

no mode symmetry

## Usage

None

## Examples

The following example shows how to set hash symmetry in port-channel:

```
Switch# configure terminal
Switch(config)# hash-field port-channel
Switch(config-hash-field)# mode symmetry
```

The following example shows how to set hash symmetry to default in port-channel:

```
Switch# configure terminal
Switch(config)# hash-field port-channel
Switch(config-hash-field)# no mode symmetry
```

## Related Commands

show hash-field

# 3.16.16 description

## Command Purpose

Use this command to configure the description for hash field; use the no command to delete the description.

## Command Syntax

description *LINE*

no description

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LINE | Hash field description | The description should be no more than 128 characters |

### Command Mode

Config-hash-field

### Default

None

### Usage

None

### Examples

The following example shows how to set description for port-channel:

```
Switch# configure terminal
Switch(config)# hash-field port-channel
Switch(config-hash-field)# description this is port-channel
```

### Related Commands

show hash-field

## 3.16.17 show hash-filed

### Command Purpose

Use this command to display the configurations and statistics on all hash fields or a hash field.

### Command Syntax

show hash-field ( port-channel | ecmp | *NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| port-channel | Port-channel of system default hash field | - |
| ecmp | Ecmp of system default hash field | - |
| NAME | Hash field name string | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following example shows how to display the configurations and statistics on the port-channel:

```
Switch# show hash-field port-channel
hash-field name: port-channel
description: this is port-channel
 Option                              Control type
------------------------------------------------------------------------
 ipv6 address compress               xor
 hash seed                           user set (0)
 hash arithmetic                     xor
 hash symmetry                       disable
 ip                                  enable
 ipv6                                enable
 mpls                                enable
------------------------------------------------------------------------
 hash field select
 Packet                HashField
------------------------------------------------------------------------
 l2:                   macsa                 macda

 ip:                   ipsa                  ipda
                       l4-sourceport         l4-destport
                       ip-protocol

 ipv6:                 ipsa                  ipda
                       l4-sourceport         l4-destport
                       ip-protocol

 gre:                  ipsa                  ipda
                       gre-key

 vxlan:                vni                   outer-l4-sourceport
                       outer-ipda            outer-ipsa
```

```
nvgre:                vsid                  outer-ipda
                      outer-ipsa

mpls:                 top-label             2nd-label

vpws:                 top-label             2nd-label

vpls(inner-l2):       inner-macda           inner-macsa

vpls(inner-l3):       inner-ipda            inner-ipsa

l3vpn:                inner-ipsa            inner-ipda
                      inner-ip-protocol     inner-l4-sourceport
                      inner-l4-destport
```

## Related Commands

None

# 3.16.18 hash value

## Command Purpose

Use this command to create a hash value and enter hash value configure view; use the no command to delete the hash value.

## Command Syntax

hash-value *NAME*

no hash-value *NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | Hash value name string | The initial character of name should be a-z, A-Z, or 0-9, character only can be 0-9A-Za-z.-_ and the max length is 64 |

## Command Mode

Global Configuration

## Default

None

## Usage

The system support the max number of hash value is 63.when applied to the interface,it can't be deleted.

## Examples

The following example shows how to creat hash value aaa:

```
Switch# configure terminal
Switch(config)# hash-value aaa
Switch(config-hash-value)#
```

The following example shows how to delete hash value aaa:

```
Switch# configure terminal
Switch(config)# no hash-value aaa
```

## Related Commands

show hash-value

# 3.16.19 port-channel unicast select

## Command Purpose

Use this command to select hash field for all mode unicast linkagg; use the no command to delete the configuration.

## Command Syntax

port-channel uincast select *NAME*

no port-channel unicast select

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | Hash field name string | - |

## Command Mode

Config-hash-value

## Default

None

## Usage

If there is only "port-channel unicast select" configuration in the hash value, the hash value can apply on the agg output and input.

If the hash value has "port-channel non-unicast select" configuration or "ecmp select" configuration, the hash value only can be applied on input port.

## Examples

The following example shows how to select hash field for linkagg in hash value aaa:

```
Switch# configure terminal
Switch(config)# hash-value aaa
Switch(config-hash-value)# port-channel unicast select user
```

The following example shows how to delete hash field for linkagg in hash value aaa:

```
Switch# configure terminal
Switch(config)# hash-value aaa
Switch(config-hash-value)# no port-channel unicast select
```

## Related Commands

show hash-value

# 3.16.20 port-channel non-unicast select

## Command Purpose

Use this command to select hash field for non-unicast linkagg; use the no command to delete the configuration.

## Command Syntax

port-channel non-unicast select *NAME*

no port-channel non-unicast select

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| NAME | Hash field name string | - |

## Command Mode

Config-hash-value

## Default

None

## Usage

None

## Examples

The following example shows how to select hash field for non-unicast linkagg in hash value aaa:

```
Switch# configure terminal
Switch(config)# hash-value aaa
Switch(config-hash-value)# port-channel non-unicast select user
```

The following example shows how to delete hash field for non-unicast linkagg in hash value aaa:

```
Switch# configure terminal
Switch(config)# hash-value aaa
Switch(config-hash-value)# no port-channel non-unicast select
```

## Related Commands

show hash-value

# 3.16.21 ecmp select

## Command Purpose

Use this command to select hash field and hash arithmetic for all mode ecmp; use the no command to delete the configuration.

## Command Syntax

ecmp select *NAME*

no ecmp select

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | Hash field name string | - |

## Command Mode

Config-hash-value

## Default

None

## Usage

This command can configure the static, dynamic or dynamic flow id mode.

## Examples

The following example shows how to select hash field for all mode ecmp in hash value aaa:

```
Switch# configure terminal
Switch(config)# hash-value aaa
Switch(config-hash-value)# ecmp select user
```

The following example shows how to delete the ecmp select configuration in hash value aaa:

```
Switch# configure terminal
Switch(config)# hash-value aaa
Switch(config-hash-value)# no ecmp select
```

## Related Commands

show hash-value

## 3.16.22 ecmp dynamic flow-id select

### Command Purpose

Use this command to select hash field and hash arithmetic for dynamic flow mode; use the no command to delete the configuration.

### Command Syntax

ecmp dynamic flow-id select *NAME*

no ecmp dynamic flow-id select

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | Hash field name string | - |

### Command Mode

Config-hash-value

### Default

None

### Usage

This command has a higher priority than command “ecmp select NAME” for dynamic flow-id mode ecmp.

### Examples

The following example shows how to select hash field and hash arithmetic for dynamic flow id ecmp in hash value aaa:

```
Switch# configure terminal
Switch(config)# hash-value aaa
Switch(config-hash-value)# ecmp dynamic flow-id select user
```

The following example shows how to delete hash field and hash arithmetic for dynamic flow id ecmp in hash value aaa:

```
Switch# configure terminal
Switch(config)# hash-value aaa
Switch(config-hash-value)# no ecmp dynamic flow-id select
```

### Related Commands

show hash-value

## 3.16.23 description

### Command Purpose

Use this command to configure the description for hash value; use the no command to delete the description.

### Command Syntax

description *LINE*

no description

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LINE | Hash value description | The description should be no more than 128 characters |

### Command Mode

Config-hash-value

### Default

None

### Usage

None

### Examples

The following example shows how set description for hash value aaa:

```
Switch# configure terminal
Switch(config)# hash-value aaa
Switch(config-hash-value)# description this is hash-value aaa
```

The following example shows how delete descrition for hash value aaa:

```
Switch# configure terminal
Switch(config)# hash-value aaa
Switch(config-hash-value)# no description
```

### Related Commands

show hash-value

## 3.16.24 show hash-value

### Command Purpose

Use this command to display the configurations of a hash value or all hash value.

### Command Syntax

show hash-value ( *NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | Hash value name string | - |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following example shows how to display the configurations of hash value:

```
Switch# show hash-value
LBT:load balance type          LBM:load balance mode
PT :packet type                HF :hash field
HA :hash arithmetic
hash-value name: aaa
 LBT             LBM             PT              HF              HA
--------------------------------------------------------------------------
 port-channel    unicast         all             NOCFG           NOCFG
 port-channel    non-unicast     all             NOCFG           NOCFG
 ecmp            -               all             NOCFG           NOCFG
 ecmp            flow id         all             NOCFG           NOCFG
```

### Related Commands

None

## 3.16.25 show hash-value interface-applied

### Command Purpose

Use this command to display the relationship between hash value and interface.

### Command Syntax

show hash-value interface-applied

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following example shows how to display the relationship between hash value paorfile and interface:

```
Switch# show hash-value interface-applied
eth-0-1
 hash-value aaa input
```

### Related Commands

None

## 3.16.26 hash value applied to interface

### Command Purpose

Use this command to apply a hash value to interface; use the no command to remove the hash-value from interface.

### Command Syntax

load-balance hash-value *NAME* ( input | output )

no load-balance hash-value ( input | output )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | Hash value name | - |
| input | Input direction | - |
| output | Output direction | - |

### Command Mode

Interface Configuration

### Default

None

### Usage

Physical port only can select input direction , linkagg port can select input direction and output direction. Agg member port can't configure the command.

## Examples

The following example shows how to apply a hash value to eth-0-1:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# load-balance hash-value aaa input
```

The following example shows how to remove a hash value from eth-0-1:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no load-balance hash-value input
```

## Related Commands

show hash-value interface-applied

# 3.16.27 hash value applied to acl

## Command Purpose

Use this command to make a hash value be acl action.

To remove the configuration,use the no form of this command.

## Command Syntax

load-balance hash-value *NAME*

no load-balance hash-value

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | Hash value name | - |

## Command Mode

Config-pmap-c

## Default

None

### Usage

Acl action has highest priority.

### Examples

The following example shows how to make a hash value be acl action:

```
Switch# configure terminal
Switch(config)# policy-map pmap1
Switch(config-pmap)# class cmap1
Switch(config-pmap-c)# load-balance hash-value aaa
```

The following example shows how to remove a hash value from acl action:

```
Switch# configure terminal
Switch(config)# policy-map pmap1
Switch(config-pmap)# class cmap1
Switch(config-pmap-c)# no load-balance hash-value
```

### Related Commands

None

## 3.16.28 hash-value global

### Command Purpose

Use this command to enter hash value global configure view.

### Command Syntax

hash-value global

### Command Mode

Global Configuration

### Default

None

## Usage

None

## Examples

The following example shows how to enter hash value global view:

```
Switch# configure terminal
Switch(config)# hash-value global
Switch(config-hash-value-global)#
```

## Related Commands

show hash-value global

# 3.16.29 port-channel select

## Command Purpose

Use this command to select hash field and hash arithmetic for linkagg; use the no command to set the default configuration.

## Command Syntax

port-channel select *NAME*

no port-channel select

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | Hash field name string | - |

## Command Mode

Config-hash-value-global

## Default

port-channel

## Usage

Compared with hash value configuration, this command has lower priority

## Examples

The following example shows how to select hash field for linkagg in hash value global :

```
Switch# configure terminal
Switch(config)# hash-value global
Switch(config-hash-value-global)# port-channel select user
```

The following example shows how to set default hash field for linkagg in hash value global :

```
Switch# configure terminal
Switch(config)# hash-value global
Switch(config-hash-value-global)# no port-channel select
```

## Related Commands

show hash-value global

# 3.16.30 ecmp select

## Command Purpose

Use this command to select hash field and hash arithmetic for all mode ecmp; use the no command to set the default configuration.

## Command Syntax

ecmp select *NAME*

no ecmp select

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | Hash field name string | - |

## Command Mode

Config-hash-value-global

## Default

ecmp

## Usage

This command can configure the static, dynamic or dynamic flow id mode.

## Examples

The following example shows how to select hash field for all mode ecmp in hash value global :

```
Switch# configure terminal
Switch(config)# hash-value global
Switch(config-hash-value-global)# ecmp select user
```

The following example shows how to set default hash field for all mode ecmp in hash value global :

```
Switch# configure terminal
Switch(config)# hash-value global
Switch(config-hash-value-global)# no ecmp select
```

## Related Commands

show hash-value global

# 3.16.31 ecmp dynamic flow-id select

## Command Purpose

Use this command to select hash field and hash arithmetic for dynamic flow mode ecmp; use the no command to set the default configuration.

## Command Syntax

ecmp dynamic flow-id select *NAME*

no ecmp dynamic flow-id select

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | Hash field name string | - |

### Command Mode

Config-hash-value-global

### Default

ecmp

### Usage

This command has a higher priority than command “ecmp select NAME” for dynamic flow id mode ecmp.

### Examples

The following example shows how to select hash field for dynamic flow mode ecmp in hash value global :

```
Switch# configure terminal
Switch(config)# hash-value global
Switch(config-hash-value-global)# ecmp dynamic flow-id select user
```

The following example shows how to set default hash field and hash arithmetic for dynamic flow mode ecmp in hash value global :

```
Switch# configure terminal
Switch(config)# hash-value global
Switch(config-hash-value-global)# no ecmp dynamic flow-id select
```

### Related Commands

show hash-value global

## 3.16.32 efd hash

### Command Purpose

Use this command to set the fields of the efd hash.

To return the configuration to default value,use the no form of this command.

## Command Syntax

efd select { ipda | ipsa | macda | macsa | sourceport | destport | ip-protocol | vxlan-vni | nvgre-vsid | inner-ipda | inner-ipsa | inner-ip-protocol | inner-macda | inner-macsa | inner-sourceport | inner-destport | src-interface }

no efd select

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ipda | IP Source Address | - |
| ipsa | IP Destination Address | - |
| macda | MAC Source Address | - |
| macsa | MAC Destination Address | - |
| sourceport | Layer4 Source Port | - |
| destport | Layer4 Destination Port | - |
| ip-protocol | IP Header protocol | - |
| vxlan-vni | VXLAN VNI | - |
| nvgre-vsid | NVGRE VSID | - |
| inner-ipda | Inner header's IP Destination Address | - |
| inner-ipsa | Inner header's IP Source Address | - |
| inner-ip-protocol | Inner header's IP Header protocol | - |
| inner-macda | Inner header's MAC Destination Address | - |
| inner-macsa | Inner header's MAC Source Address | - |
| inner-sourceport | Inner header's Layer4 Source Port | - |
| inner-destport | Inner header's Layer4 Destination Port | - |
| src-interface | Source Interface | - |

## Command Mode

Config-hash-value-global

## Default

ipda ipsa macda macsa sourceport destport ip-protocol

## Usage

EFD flow hash has the same value with this command configuration.

## Examples

The following example shows how to set fields for EFD hash:

```
Switch# configure terminal
Switch(config)# hash-value global
Switch(config-hash-value-global)# efd select ipsa ipda
```

The following example shows how to delete fields for EFD hash:

```
Switch# configure terminal
Switch(config)# hash-value global
Switch(config-hash-value-global)# no efd select
```

## Related Commands

show hash-value global

# 3.16.33 entropy select

## Command Purpose

Use this command to set the fields of the entropy hash.

To return the configuration to default value,use the no form of this command.

## Command Syntax

entropy select *NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | Hash field name string | - |

## Command Mode

Config-hash-value-global

## Default

None

### Usage

None

### Examples

The following example shows how to set fields for entropy hash:

```
Switch# configure terminal
Switch(config)# hash-value global
Switch(config-hash-value-global)# entropy select usr
```

The following example shows how to delete fields for entropy hash:

```
Switch# configure terminal
Switch(config)# hash-value global
Switch(config-hash-value-global)# no entropy select
```

### Related Commands

show hash-value global

## 3.16.34 show hash-value global

### Command Purpose

Use this command to display the configurations of hash value global.

### Command Syntax

show hash-value global

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

## Examples

The following example shows how to display the configurations of hash value global:

```
Switch# show hash-value global
LBT:load balance type         LBM :load balance mode
PT :packet type               HF  :hash field
HA :hash arithmetic
hash-value global
 LBT            LBM            PT             HF             HA
-------------------------------------------------------------------------
 port-channel   -              all            port-channel   xor
 ecmp           -              all            ecmp           xor
 ecmp           flow id        all            ecmp           xor
 entropy        -              all            ecmp           xor
-------------------------------------------------------------------------
 Efd hash field select:
  macsa                 macda
  ipsa                  ipda
  sourceport            destport
  ip-protocol
```

## Related Commands

None

# 3.16.35 disable ecmp round-robin

## Command Purpose

Use this command to disable ecmp round robin load balance as a acl action.

To remove the configuration,use the no form of this command.

## Command Syntax

ecmp load-balance round-robin disable

no ecmp load-balance round-robin disable

## Command Mode

Config-pmap-c

### Default

None

### Usage

None

### Examples

The following example shows how to disable ecmp round-robin as a acl action:

```
Switch# configure terminal
Switch(config)# policy-map map1
Switch(config-pmap)# class class-default
Switch(config-pmap-c)# ecmp load-balance round-robin disable
```

The following example shows how to enable ecmp round-robin as a acl action:

```
Switch# configure terminal
Switch(config)# policy-map map1
Switch(config-pmap)# class class-default
Switch(config-pmap-c)# no ecmp load-balance round-robin disable
```

### Related Commands

None

## 3.16.36 disable port-channel round-robin

### Command Purpose

Use this command to disable linkagg round robin load balance as a acl action.

To remove the configuration,use the no form of this command.

### Command Syntax

port-channel load-balance round-robin disable

no port-channel load-balance round-robin disable

## Command Mode

Config-pmap-c

## Default

None

## Usage

None

## Examples

The following example shows how to disable linkagg round-robin as a acl action:

```
Switch# configure terminal
Switch(config)# policy-map map1
Switch(config-pmap)# class class-default
Switch(config-pmap-c)# port-channel load-balance round-robin disable
```

The following example shows how to enable linkagg round-robin as a acl action:

```
Switch# configure terminal
Switch(config)# policy-map map1
Switch(config-pmap)# class class-default
Switch(config-pmap-c)# no port-channel load-balance round-robin disable
```

## Related Commands

None

# 4 IP Service Commands

## 4.1 ARP Commands

### 4.1.1 arp

#### Command Purpose

To add a permanent entry in the Address Resolution Protocol (ARP) cache, use the arp command in global configuration mode.

To remove an entry from the ARP cache, use the no form of this command.

#### Command Syntax

arp ( vrf *VRF-NAME* | ) *IP-ADDRESS HARDWARE-ADDRESS*

no arp ( vrf *VRF-NAME* | ) *IP-ADDRESS*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| vrf VRF-NAME | Virtual Routing and Forwarding (VRF) instance. The vrf-name argument is the name of the VRF table | String with up to 31 characters |
| IP-ADDRESS | IP address in four-part dotted decimal format corresponding to the local data-link address | IPv4 Address |
| HARDWARE-ADDRESS | Local data-link address (a 48-bit address) | MAC Address |

#### Command Mode

Global Configuration

### Default

No entries are permanently installed in the ARP cache.

### Usage

Because most hosts support dynamic resolution, you generally need not specify static ARP cache entries.

To remove all none static entries from the ARP cache, use the clear arp-cache privileged EXEC command.

### Examples

The following is an example of add a static ARP entry for a typical Ethernet host:

```
Switch# configure terminal
Switch(config)# arp 10.31.7.19 0800.0900.1834
```

### Related Commands

clear arp-cache

## 4.1.2 arp retry-interval

### Command Purpose

When an interface requests a mapping for an address not in the cache, system will send ARP request message on the associated network requesting the address mapping. Usually, 3 request messages will be sent until the system got a response. To configure the ARP request delay interval between 2 messages, use arp retry-interval command in interface configuration mode. To restore the default value, use the no form of this command.

### Command Syntax

arp retry-interval *SECONDS*

no arp retry-interval

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| SECONDS | Time (in seconds) that an ARP request delay to interface | 0-3 seconds |

## Command Mode

Interface Configuration

## Default

1 second

## Usage

This command is ignored when issued on interfaces that do not use ARP. The show interface EXEC command displays the ARP retry interval value. The value as seen in the following example from the show interface command:

ARP timeout 01:00:00, ARP retry interval 1s

## Examples

The following example sets the ARP retry interval to 3 seconds:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport
Switch(config-if)# arp retry-interval 3
```

## Related Commands

show interface

# 4.1.3 arp timeout

## Command Purpose

Use this command to set the arp timeout value. Use the no form of this command to restore the default value.

## Command Syntax

arp timeout *SECONDS*

no arp timeout

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SECONDS | Time (in seconds) that an entry remains in the ARP cache. <1-2147483> | 1-2147483 seconds |

## Command Mode

Interface Configuration

## Default

3600 seconds (1 hour)

## Usage

This command is ignored when issued on interfaces that do not use ARP. The show interface EXEC command displays the ARP timeout value. The value as seen in the following example from the show interface command:

ARP timeout 01:00:00, ARP retry interval 1s

## Examples

The following example sets the ARP timeout to 1200 seconds to allow entries to time out more quickly than the default:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport
Switch(config-if)# arp timeout 1200
```

## Related Commands

show interface

## 4.1.4 arp as-layer-3 enable

### Command Purpose

To set that deal with the arp packet as layer3 packet. To disable arp as-layer-3, use the no form of this command.

### Command Syntax

arp as-layer-3 enable

no arp as-layer-3 enable

### Command Mode

Global Configuration

### Default

Disable

### Usage

vlan classifier and IGMP Snooping affected by the CLI.

Enable, vlan classifier activate base ip, the arp packet matched source ip address will classifier to specified vlan. Otherwise, not classifier to specified vlan.

Enable, ip source guard enable the ip check on the port, the arp packet matched source ip address will not filter. Ohterwise, will filter.

### Examples

The following example show how to enable arp as-layer-3:

```
Switch# configure terminal
Switch(config)# arp as-layer-3 enable
```

### Related Commands

N/A

## 4.1.5 arp fake global enable

### Command Purpose

To enable fake arp global, use the no form of this command.To disable arp fake global, use the no form of this command.

### Command Syntax

arp fake global enable

no arp fake global enable

### Command Mode

Global Configuration

### Default

Disable

### Usage

Not effect until both enable global and interface arp fake.

### Examples

The following example show how to enable global fake arp:

```
Switch# configure terminal
Switch(config)# arp fake global enable
```

### Related Commands

arp fake enable

## 4.1.6 arp fake enable

### Command Purpose

To enable fake arp on interface, use the no form of this command.

## Command Syntax

arp fake enable

no arp fake enable

## Command Mode

Interface Configuration

## Default

Enable

## Usage

If enable, the interface receive IP packets that not match any ARP entry will create an fake ARP entry. Before interface received ARP reply, the IP packets matched the fake ARP entry will be dropped. After interface received ARP reply, will create active ARP entry instead of fake ARP entry.

## Examples

The following example show how to enable fake arp:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# arp fake enable
```

## Related Commands

arp fake global enable

# 4.1.7 arp fake timeout

## Command Purpose

To configure how long a fake entry remains in the ARP cache, use the arp fake timeout command in interface configuration mode. To restore the default value, use the no form of this command.

## Command Syntax

arp fake timeout *SECONDS*

no arp fake timeout

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SECONDS | Time that a fake entry remains in the ARP cache. | 1-36000, unit:second |

## Command Mode

Interface Configuration

## Default

5 seconds

## Usage

When switch was attached, can let the fake ARP entry to time out later.

## Examples

The following example sets the ARP fake timeout to 100 seconds to allow entries to time out:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# arp fake timeout 100
```

## Related Commands

N/A

# 4.1.8 clear arp-cache

## Command Purpose

To refresh dynamically created entries from the Address Resolution Protocol (ARP) cache, use the clear arp-cache command in privileged EXEC mode.

## Command Syntax

clear arp-cache ( ( vrf *VRF-NAME* | ) interface *IFNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| vrf VRF-NAME | (Optional) Refreshes only the ARP table entries for the specified Virtual Private Network (VPN) routing and forwarding (VRF) instance | String with up to 31 characters |
| IFNAME | (Optional) Refreshes only the ARP table entries associated with this interface | Support physical/aggregation/loopback/vlan/tunnel ports |

## Command Mode

Privileged EXEC

## Default

No default behavior or values.

## Usage

This command updates the dynamically learned IP address and MAC address mapping information in the ARP table to ensure the validity of those entries. If the refresh operation encounters any stale entries (dynamic ARP entries that have expired but have not yet been aged out by an internal, timer-driven process), those entries are aged out of the ARP table immediately as opposed to at the next refresh interval.

Use this command without any arguments or keywords to refresh all ARP cache entries for all enabled interfaces.

## Examples

The following example shows how to refresh all dynamically learned ARP cache entries for all enabled interfaces:

```
Switch# clear arp-cache
```

## Related Commands

show ip arp

# 4.1.9 clear ip arp

## Command Purpose

To refresh the specific dynamically created entry from the Address Resolution Protocol (ARP) cache, use the clear ip arp command in privileged EXEC mode.

## Command Syntax

clear ip arp ( vrf *VRF-NAME* | ) *IP-ADDRESS*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| vrf VRF-NAME | (Optional) Refreshes only the ARP table entries for the specified Virtual Private Network (VPN) routing and forwarding (VRF) instance | String with up to 31 characters |
| IP-ADDRESS | (Optional) Refreshes only the ARP table entries associated with this IP address | - |

## Command Mode

Privileged EXEC

## Default

No default behavior or values.

## Usage

This command updates the specific dynamically learned IP address and MAC address mapping information in the ARP table. If the refresh operation encounters any stale entries (dynamic ARP entries that have expired but have not yet been aged out by an internal, timer-driven process), the entry is aged out of the ARP table immediately as opposed to at the next refresh interval.

### Examples

The following example shows how to refresh the dynamically learned ARP entries 10.10.10.10:

```
Switch# clear ip arp 10.10.10.10
```

### Related Commands

show ip arp

## 4.1.10 clear ip arp statistics

### Command Purpose

To clear ARP packets statistics processed by system, use the clear ip arp statistics command in privileged EXEC mode.

### Command Syntax

clear ip arp ( vrf *VRF-NAME* | ) statistics

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| vrf VRF-NAME | (Optional) Clear ARP statistics for the specified Virtual Private Network (VPN) routing and forwarding (VRF) instance | String with up to 31 characters |

### Command Mode

Privileged EXEC

### Default

No default behavior or values.

### Usage

This command use to clear ARP packets statistics.

## Examples

The following example shows how to clear ARP packets statistcs:

```
Switch# clear ip arp statistics
```

## Related Commands

show ip arp summary

# 4.1.11 show ip arp

## Command Purpose

To display the entries in the Address Resolution Protocol (ARP) table, use the show ip arp command in privileged EXEC mode.

## Command Syntax

show ip arp ( ( vrf *VRF-NAME* | ) interface *INTERFACE-NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| vrf VRF-NAME\| | (Optional) Displays the entries under the Virtual Private Network (VPN) routing and forwarding (VRF) instance specified by the vrf-name argument | String with up to 31 characters |
| INTERFACE-NAME | (Optional) Refreshes only the ARP table entries associated with this interface | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

To display all entries in the ARP cache, use this command without any arguments or keywords.

## Examples

The following is sample output from the show ip arp command:

```
Switch# show ip arp
 Protocol    Address          Age (min)  Hardware Addr   Interface
 Internet    1.1.1.1                 -   7cb5.0157.0c00  eth-0-1
 Internet    2.2.2.1                 -   7cb5.0157.0c00  eth-0-2
 Internet    3.3.3.1                 -   7cb5.0157.0c00  eth-0-3
 Internet    10.0.20.1               -   7cb5.0157.0c00  eth-0-10
 Internet    10.0.20。254             -   0000.5e00.0101  eth-0-10
```

## Related Commands

clear ip arp

# 4.1.12 show ip arp summary

## Command Purpose

To display the total number of Address Resolution Protocol (ARP) table entries, the number of ARP table entries for each ARP entry mode, and the number of ARP table entries for each interface on the router, use the show ip arp summary command in privileged EXEC mode.

## Command Syntax

show ip arp ( vrf *VRF-NAME* | ) summary

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| vrf VRF-NAME | (Optional) Displays the entries under the Virtual Private Network (VPN) routing and forwarding (VRF) instance specified by the vrf-name argument | String with up to 31 characters |

## Command Mode

Privileged EXEC

## Default

None

## Usage

Use this command to display high-level statistics about the ARP table entries:

## Examples

The following is sample output from the show ip arp summary command:

```
Switch# show ip arp summary
 Gratuitous ARP learning is disabled
 2 IP ARP entries, with 0 of them incomplete
 (Static:1,  Dyamic:0, Interface:1)
 ARP Pkt Received is: 0
 ARP Pkt Send number is: 1
 ARP Pkt Dicard number is: 0
```

## Related Commands

clear ip arp statistics

# 4.1.13 debug arp

## Command Purpose

To turn on the ARP debug, use debugs arp command in EXEC mode. To turn off the ARP debug, use the no form of this command.

## Command Syntax

debug arp ( vrf *VRF-NAME* | )

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| vrf VRF-NAME | (Optional) Displays the entries under the Virtual Private Network (VPN) routing and forwarding (VRF) instance specified by the vrf-name argument | String with up to 31 characters |

## Command Mode

Privileged EXEC

## Default

None

## Usage

Use this command to debug ARP packets received and send; also for debug ARP entry creating, updating and deleting.

## Examples

The following is sample output from the debug arp command:

```
Switch# debug arp
 Sep  7 03:34:08 SWITCH ARP-7: IP ARP: creating entry for IP address: 7.7.7.7, hw: e64d。0445。df00
Sep  7 03:34:08 SWITCH ARP-7: IP ARP: send req src 7.7.7.7 e64d。0445。df00, dst 7.7.7.7 eth-0-1
```

## Related Commands

show debugging arp

# 4.1.14 show debugging arp

## Command Purpose

To display the debugging status of ARP, use the show debugging arp command in EXEC mode.

## Command Syntax

show debugging arp ( vrf *VRF-NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| vrf VRF-NAME | (Optional) Displays the entries under the Virtual Private Network (VPN) routing and forwarding (VRF) instance specified by the vrf-name argument | String with up to 31 characters |

## Command Mode

Privileged EXEC

## Default

None

## Usage

Use this command to display the debugging status of ARP.

## Examples

The following is sample output from the show debugging arp command:

```
Switch# show debugging arp
 ARP debugging status:
  ARP packet debugging is on
```

## Related Commands

debug arp

# 4.1.15 proxy-arp enable

## Command Purpose

The switch uses proxy ARP to help hosts determine MAC addresses of hosts on other networks or subnets.

To enable proxy Address Resolution Protocol (ARP) on an interface, use the proxy-arp enable command in interface configuration mode. To disable proxy ARP on the interface, use the no form of this command.

## Command Syntax

proxy-arp enable

no proxy-arp enable

## Command Mode

Interface Configuration

## Default

Proxy ARP is disabled by default.

## Usage

When proxy ARP is disabled, a device will respond to ARP requests received on its interface only if the target IP address is the same as its IP address.

## Examples

The following example enables proxy ARP on interface eth-0-1:

```
Switch# configure terminal
Switch(config)#interface eth-0-1
Switch(config-if)#no switchport
Switch(config-if)#no shutdown
Switch(config-if)#ip address 1.1.1.1/24
Switch(config-if)# proxy-arp enable
```

## Related Commands

local-proxy-arp enable

## 4.1.16 local-proxy-arp enable

### Command Purpose

The local proxy ARP feature allow the L3 Device to response ARP request whose ARP Target address is in the same subnet the as the ARP request comes from (No Routing is required).

To enable local proxy Address Resolution Protocol (ARP) on an interface, use the local-proxy-arp enable command in interface configuration mode.

To disable proxy ARP on the interface, use the no form of this command.

### Command Syntax

local-proxy-arp enable

no local-proxy-arp enable

### Command Mode

Interface Configuration

### Default

Local proxy ARP is disabled by default.

### Usage

Internet Control Message Protocol (ICMP) redirects are disabled on interfaces when the local proxy ARP feature is enabled. The main condition we need to enable local ARP proxy is that the switch enables port isolate.

### Examples

The following example enables local proxy ARP on interface eth-0-1:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport
Switch(config-if)# no shutdown
```

```
Switch(config-if)# ip address 1.1.1.1/24
Switch(config-if)# local-proxy-arp enable
```

### Related Commands

proxy-arp enable

## 4.1.17 gratuitous-arp-learning enable

### Command Purpose

To enable the gratuitous Address Resolution Protocol (ARP) control on the router, use the gratuitous-arp-learning enable command in global configuration mode. To disable the ARP control, use the no form of this command.

### Command Syntax

gratuitous-arp-learning enable

no gratuitous-arp-learning enable

### Command Mode

Global Configuration

### Default

Gratuitous ARP learning is disabled by default.

### Usage

None

### Examples

The following example enables gratuitous ARP learning on switch:

```
Switch# configure terminal
Switch(config)# gratuitous-arp-learning enable
```

## Related Commands

show ip arp summary

# 4.1.18 gratuitous-arp send interval

## Command Purpose

To config the gratuitous ARP send interval, use the no form of this command to recover to default.

## Command Syntax

arp gratuitous-arp send interval *SECONDS*

no arp gratuitous-arp send interval

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SECONDS | The interval in seconds to send gratuitous ARP | 1-86400 seconds |

## Command Mode

Interface Configuration

## Default

60 seconds

## Usage

None

## Examples

The following example config gratuitous ARP send interval on interface eth-0-1:

```
Switch# configure terminal
Switch(config)#interface eth-0-1
Switch(config-if)#no switchport
Switch(config-if)#no shutdown
Switch(config-if)#ip address 1.1.1.1/24
Switch(config-if)#arp gratuitous-arp send interval 80
```

### Related Commands

arp gratuitous-arp send enable

## 4.1.19 gratuitous-arp send enable

### Command Purpose

To enable the gratuitous ARP send on the interface.

### Command Syntax

arp gratuitous-arp send enable

no arp gratuitous-arp send enable

### Command Mode

Interface Configuration

### Default

disbale

### Usage

None

### Examples

The following example enable gratuitous ARP oninterface eth-0-1:

```
Switch# configure terminal
Switch(config)#interface eth-0-1
Switch(config-if)#no switchport
Switch(config-if)#no shutdown
Switch(config-if)#ip address 1.1.1.1/24
Switch(config-if)#arp gratuitous-arp send enable
```

### Related Commands

arp gratuitous-arp send interval

# 4.2 DHCP Client Commands

## 4.2.1 ip address dhcp

### Command Purpose

To acquire an IP address from Dynamic Host Configuration Protocol(DHCP), use the ip address dhcp command in interface configuration mode.

To disable the function, use the no form of this command.

### Command Syntax

ip address dhcp

no ip address dhcp

### Command Mode

Interface Configuration

### Default

DHCP Client is not enabled on interface.

### Usage

Once this command was enabled on an UP interface, it will acquire IP address immediately, otherwise the DHCP function of the interface will be in SUSPEND status.

The no ip address dhcp command will send a DHCPRELEASE message to server and remove any IP address.

### Examples

The following example shows how to enable dhcp client function:

```
Switch# configure terminal
Switch(config-if)# ip address dhcp
```

The following example shows how to disable dhcp client function:

```
Switch# configure terminal
Switch(config-if)# no ip address dhcp
```

### Related Commands

dhcp client request

dhcp client client-id

dhcp client class-id

dhcp client lease

dhcp client hostname

management ip address dhcp

show dhcp client

## 4.2.2 management ip address dhcp

### Command Purpose

To acquire an IP address for management interface from by DHCP, use the management IP address dhcp command in global configuration mode.

To disable the function, use the no form of this command.

### Command Syntax

management ip address dhcp

no management ip address dhcp

### Command Mode

Global Configuration

### Default

DHCP Client is not enabled on management interface.

## Usage

Use this command like IP address dhcp.

## Examples

The following example shows how to enable dhcp client function on management interface:

```
Switch# configure terminal
Switch(config)# management ip address dhcp
```

The following example shows how to disable dhcp client function on management interface:

```
Switch# configure terminal
Switch(config)# no management ip address dhcp
```

## Related Commands

show dhcp client

# 4.2.3 dhcp client request

## Command Purpose

To request configuration parameters by DHCP, use the dhcp client request command in interface configuration mode. To cancel the request, use the no form of this command.

## Command Syntax

dhcp client request ( router | static-route | classless-static-route | classless-static-route-ms | tftp-server-address | dns-nameserver | domain-name | netbios-nameserver | vendor-specific )

no dhcp client request ( router | static-route | classless-static-route | classless-static-route-ms | tftp-server-address | dns-nameserver | domain-name | netbios-nameserver | vendor-specific )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| router | Default router option (3) | - |

| | | |
|---|---|---|
| static-route | Static route option (33) | - |
| classless-static-route | Classless static route option (121) | - |
| classless-static-route-ms | Microsoft classless static route option (249) | - |
| tftp-server-address | TFTP server ip address option (150) | - |
| dns-nameserver | DNS name server option (6) | - |
| domain-name | Domain name option (15) | - |
| netbios-nameserver | NetBIOS name server option (44) | - |
| vendor-specific | Vendor specific option (43) | - |

## Command Mode

Interface Configuration

## Default

static-route, classless-static-route, classless-static-route-ms, tftp-server-address and router is requested as default.

## Usage

Use this command to request configuration form DHCP server. It can be typed many times with each option or one time with all options wanted. Note that when Option 249 coexist with option 121 then the option 121 should have high priority and option 249 should be ignored. when option 121 or option 249 coexist with option 33 then the option 33 should be ignored. This command should be issued before ip address dhcp command. If you issued ip address dhcp before, this command will take effect after next ip address dhcp command.

## Examples

The following example shows how to request dhcp option static-route and tftp-server-address:

```
Switch# configure terminal
Switch(config-if)# no management ip address dhcp
```

The following example shows how to request dhcp option router:

```
Switch# configure terminal
Switch(config-if)# dhcp client request router
```

The following example shows how to cancel request of dhcp option router:

```
Switch# configure terminal
Switch(config-if)# no dhcp client request router
```

The following example shows how to request tftp server address:

```
Switch# configure terminal
Switch(config-if)# dhcp client request static-route tftp-server-address
```

### Related Commands

ip address dhcp

## 4.2.4 dhcp client client-id

### Command Purpose

To specify a client-id used by DHCP server and client for identifying a client, use the dhcp client client-id command in interface configuration mode.

To remove this configuration, use the no form of this command.

### Command Syntax

dhcp client client-id ( ascii *WORD* | hex *HEX-STRING* | *IFVLAN* | *IFAGG* | *IFPHYSICAL* )

no dhcp client client-id

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ascii | ASCII type | - |
| WORD | Client-ID as ascii string | String with up to 64 characters |
| hex | Hex type | - |
| HEX-STRING | Class-ID in hex string | String with up to 64 characters |
| IFVLAN | Vlan interface's name | 1-4094 |
| IFAGG | Aggregation interface's name | - |

| | | |
|---|---|---|
| IFPHYSICAL | Physical interface's name | - |

## Command Mode

Interface Configuration

## Default

The default client-id, format of which is like "switch-HWADDR-IFNAME", will be used.

## Usage

This command should be issued before IP address dhcp command. If you issued IP address dhcp before, this command will take effect after next IP address dhcp command.

## Examples

The following example shows how to specify a client-id for an interface:

```
Switch# configure terminal
Switch(config-if)# dhcp client client-id ascii switch-client
```

The following example shows how to delete client-id set before:

```
Switch# configure terminal
Switch(config-if)# no dhcp client client-id
```

## Related Commands

ip address dhcp

# 4.2.5 dhcp client class-id

## Command Purpose

To specify a class-id for DHCP server and client, use the dhcp client class-id command in interface configuration mode. To remove this configuration, use the no form of this command.

## Command Syntax

dhcp client class-id ( *WORD* | hex *HEX-STRING* )

no dhcp client class-id

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| WORD | Client-ID as ascii string | - |
| hex | Hex type | - |
| HEX-STRING | Class-ID in hex string | - |

## Command Mode

Interface Configuration

## Default

No class-id is set.

## Usage

Class-id used by DHCP clients to optionally identify the type and configuration of a DHCP client. Vendors and sites may choose to define specific class identifiers to convey particular configuration or other identification information about a client. This command should be issued before ip address dhcp command. If you issued ip address dhcp before, this command will take effect after next ip address dhcp command.

## Examples

The following example shows how to specify class-id for an interface:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# dhcp client class-id acsii switch
```

The following example shows how to delete class-id set before:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no dhcp client class-id
```

### Related Commands

ip address dhcp

## 4.2.6 dhcp client lease

### Command Purpose

To configure the duration of the lease for an IP address request by DHCP client, use the dhcp client lease command in interface configuration mode.

To remove the configuration, use the no form of this command.

### Command Syntax

dhcp client lease *DAYS* ( *HOURS* ( *MINUTES* | ) | ) | infinite )

no dhcp client lease

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DAYS | The number of days in lease | 0-365 |
| HOURS | The number of hours in the lease. | 0-23 |
| MINUTES | The number of minutes in the lease | 0-59 |
| infinite | infinite lease | - |

### Command Mode

Interface Configuration

### Default

No lease is requested by client.

### Usage

Use this command to specify the lease wanted by client, DHCP server may accept this request or ignore it. This command should be issued before ip address dhcp command. If you issued ip address dhcp before, this command will take effect after next ip address dhcp command.

## Examples

The following example shows how to specify lease 20 minutes for dhcp client:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# dhcp client lease 0 0 20
```

The following example shows how to remove the lease set before:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no dhcp client lease
```

## Related Commands

ip address dhcp

# 4.2.7 dhcp client hostname

## Command Purpose

To specify or modify the hostname sent in the DHCP message; use the dhcp client hostname command in interface configuration mode.

To remove the hostname, use the no form of this command.

## Command Syntax

dhcp client hostname *WORD*

no dhcp client hostname

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| WORD | Host name | String with up to 256 characters |

## Command Mode

Interface Configuration

## Default

The host name in system will be used.

## Usage

This command should be issued before ip address dhcp command. If you issued IP address dhcp before, this command will take effect after next IP address dhcp command.

## Examples

The following example shows how to specify name of the host:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# dhcp client hostname switch
```

The following example shows how to remove the last set:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no dhcp client hostname
```

## Related Commands

ip address dhcp

# 4.2.8 dhcp client default-router distance

## Command Purpose

To specify the default router distance for the routes leased from DHCP server, use the dhcp client default-router distance command in global configuration mode. To remove the configuration, use the no form of this command.

## Command Syntax

dhcp client default-router distance *METRIC*

no dhcp client default-router distance

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| METRIC | The default metric of routes | 1-255 |

## Command Mode

Global Configuration

## Default

The default value for the default metric is 254.

## Usage

None

## Examples

The following example shows how to set dhcp client default route metric as 233:

```
Switch# configure terminal
Switch(config)# dhcp client default-router distance 233
```

The following example shows how to use the default value of default route metric:

```
Switch# configure terminal
Switch(config)# no dhcp client default-router distance
```

## Related Commands

ip address dhcp

# 4.2.9 dhcp client broadcast-flag

## Command Purpose

To specify the broadcast-flag in the DHCP message, use the dhcp client broadcast-flag command in global configuration mode.

To remove this configuration, use the no form of this command.

## Command Syntax

dhcp client broadcast-flag

no dhcp client broadcast-flag

### Command Mode

Global Configuration

### Default

Broadcast-flag will be set in DHCP message sent by client for request IP address.

### Usage

This flag tell DHCP server that client can't receive unicast IP datagrams until been configured with an IP address. Thus server or relay agent will broadcast any messages to the client on the client's subnet.

### Examples

The following example shows how to set broadcast-flag:

```
Switch# configure terminal
Switch(config)# dhcp client broadcast-flag
```

The following example shows how to delete broadcast-flag:

```
Switch# configure terminal
Switch(config)# no dhcp client broadcast-flag
```

### Related Commands

ip address dhcp

## 4.2.10 debug dhcp client

### Command Purpose

Use this command to turn on the debug switches of dhcp client module.

To restore the default, use the no form of this command

### Command Syntax

debug dhcp client ( events | error | dump | packet | all )

no debug dhcp client ( events | error | dump | packet | all )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| events | Client events | - |
| error | Error DHCP message | - |
| packet | DHCP message fields | - |
| dump | Dump message in hex format | - |
| all | Turn all debugging on | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

Use command "terminal monitor" to make debug messages print on the VTY immediately.

Use command "show logging buffer" to check the debug messages in the logging buffer.

## Examples

The following is sample to open dhcp client debug switches:

```
Switch# debug dhcp client all
```

## Related Commands

terminal monitor

show logging buffer

# 4.2.11 show dhcp client

## Command Purpose

To show information of dhcp client on one or all interfaces, use the show dhcp client command in privileged EXEC mode.

## Command Syntax

show dhcp client ( management | *IFVLAN* | *IFAGG* | *IFPHYSICAL* | ) ( verbose | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| management | Management interface | - |
| IFVLAN | Vlan interface's name | 1-4094 |
| IFAGG | Aggregation interface's name | - |
| IFPHYSICAL | Physical interface's name | - |
| verbose | DHCP client verbose information | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

To see more detail information, add verbose at the last of command

## Examples

The following example shows how to display DHCP client information on all interfaces:

```
Switch# show dhcp client verbose
DHCP client informations:
============================================================
vlan1 DHCP client information:
  Current state: SELECT
```

```
  Transaction ID: 0x3ac1c1c7
============================================================
eth-0-1 DHCP client information:
  Current state: SELECT
  Transaction ID: 0x2fd3f55b
```

### Related Commands

ip address dhcp

## 4.2.12 show dhcp client statistics

### Command Purpose

To show statistics of DHCP client, use the show dhcp client statistics command in privileged EXEC mode.

### Command Syntax

show dhcp client statistics

### Command Mode

Privileged EXEC

### Default

None

### Usage

Use this command to show the status of DHCP client, like DHCP packets counter.

### Examples

The following example shows how to display DHCP packets statistics:

```
Switch# show dhcp client statistics
DHCP client packet statistics:
============================================================
DHCP OFFERS     received: 0
DHCP ACKs       received: 0
DHCP NAKs       received: 0
```

```
DHCP Others    received: 0
DHCP DISCOVER      sent: 0
DHCP DECLINE       sent: 0
DHCP RELEASE       sent: 0
DHCP REQUEST       sent: 0
DHCP packet send failed: 0
```

### Related Commands

ip address dhcp

## 4.2.13 clear dhcp client statistics

### Command Purpose

To clear statistics of dhcp client, use the clear dhcp client statistics command in privileged EXEC mode.

### Command Syntax

clear dhcp client statistics

### Command Mode

Privileged EXEC

### Default

None

### Usage

This command will clear DHCP packet counter.

### Examples

The following example shows how to clear statistics:

```
Switch# clear dhcp client statistics
```

### Related Commands

ip address dhcp

show dhcp client statistics

## 4.3 DHCP Relay Commands

### 4.3.1 dhcp relay

#### Command Purpose

To enable the DHCP relay service, use the dhcp relay command in global configuration mode.

To disable this function, use the no form of this command.

#### Command Syntax

dhcp relay

no dhcp relay

#### Command Mode

Global Configuration

#### Default

DHCP relay is disabled.

#### Usage

The DHCP service must be enabled with the dhcp service command before DHCP relay service can be used.

#### Examples

The following example shows how to enable DHCP relay agent:

```
Switch# configure terminal
Switch(config)# dhcp relay
```

### Related Commands

service dhcp

## 4.3.2 dhcp-server (global)

### Command Purpose

To create a DHCP server group, use the dhcp-server command in global configuration mode.

To remove a DHCP server group, use the no form of this command.

### Command Syntax

dhcp-server *NUMBER SERVER-LIST*

no dhcp-server *NUMBER* ( *SERVER-LIST* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NUMBER | Number of the DHCP server group. | 1-16 |
| SERVER-LIST | The IP address list of the DHCP server. | 1-16 |

### Command Mode

Global Configuration

### Default

No DHCP server group is defined.

### Usage

This command is used to specify the remote DHCP server.

## Examples

The following example shows how to configure dhcp-server group globally:

```
Switch# configure terminal
Switch(config)# dhcp-server 1 1.1.1.1 2.2.2.2 3.3.3.3
```

## Related Commands

service dhcp

dhcp-server (interface)

# 4.3.3 dhcp-server (interface)

## Command Purpose

To add an interface into a DHCP server group, use the dhcp-server command in interface configuration mode.

To remove this interface from the DHCP server group, use the no form of this command.

## Command Syntax

dhcp-server *NUMBER*

no dhcp-server

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NUMBER | Number of the DHCP server group. | 1-16 |

## Command Mode

Interface Configuration

## Default

No DHCP server group is configured for the interface.

### Usage

This command is used to specify DHCP server group which is configured by the command dhcp-server in global mode.

### Examples

The following example shows how to configure dhcp-server group for interface:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# dhcp-server 1
```

### Related Commands

service dhcp

## 4.3.4 dhcp relay information check

### Command Purpose

To enable validation of relay agent information option in forwarded reply messages, use the dhcp relay information check command in global configuration mode.

To disable an information check, use the no form of this command.

### Command Syntax

dhcp relay information check

no dhcp relay information check

### Command Mode

Global Configuration

### Default

The validation of relay agent information is enabled. Invalid messages are dropped.

### Usage

None

### Examples

The following example shows how to enable validation of relay agent information:

```
Switch# configure terminal
Switch(config)# dhcp relay information check
```

### Related Commands

dhcp relay information option

## 4.3.5 dhcp relay information option

### Command Purpose

To enable the system to insert a DHCP relay agent information option in forwarded request messages to a DHCP server, use the dhcp relay information option command in global configuration mode. To disable inserting relay information, use the no form of this command.

### Command Syntax

dhcp relay information option

no dhcp relay information option

### Command Mode

Global Configuration

### Default

No relay agent information is inserted.

## Usage

The dhcp relay information option command automatically adds the circuit identifier suboption and the remote ID suboption to the DHCP relay agent information option (also called option 82).

## Examples

The following example shows how to enable inserting of dhcp relay information option:

```
Switch# configure terminal
Switch(config)# dhcp relay information option
```

## Related Commands

dhcp relay information check

dhcp relay information policy

# 4.3.6 dhcp relay information option format

## Command Purpose

Use this command to enable the switch to insert the Option82 option when forwarding BOOTREQUEST messages to the DHCP server. Use the 'no' format of this command to disable this feature.

## Command Syntax

dhcp relay information option format ( link-selection | server-id-override | vss-control | )

no dhcp relay information option format ( link-selection | server-id-override | vss-control | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| link-selection | Insert link-selection sub option in Option82 of DHCP message | - |

| | | |
|---|---|---|
| server-id-override | Insert server-id-override sub option in Option82 of DHCP message | - |
| vss-control | Insert server-id-override sub option in Option82 of DHCP message | - |

## Command Mode

interface Configuration

## Default

By default, the Option82 option is not inserted into DHCP packets.

## Usage

Use this command to add appropriate content to the Option82 option. By default, the system does not insert the Option82 option into DHCP packets. The dhcp relay information option command will add the circuit ID and remote ID to the message by default. For other sub options, they need to be manually specified separately.

## Examples

Enable the interface to insert the Option82 option into DHCP packets and add link-selection

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# dhcp relay information option format link-selection
```

## Related Commands

dhcp relay information option

## 4.3.7 dhcp relay source-interface

### Command Purpose

Use this command to configure the source IP address used by the interface to send DHCP messages to the DHCP Server.

Use the no format of this command to restore to the default configuration.

### Command Syntax

dhcp relay source-interface IFNAME

no dhcp relay source-interface

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| eth- | Physical interface | - |
| agg | Aggregation interface | - |
| loopback | Loopback interface | - |
| vlan | Vlan interface | - |
| tunnel | Tunnel interface | - |

### Command Mode

interface Configuration

### Default

The source IP address of DHCP relay packets is the routing interface address from the switch to the server.

### Usage

None

### Examples

Use the IP address of loopback1 as the source IP address for DHCP relay packets

```
Switch(config)# interface loopback 1
Switch(config-if)# ip address 10.1.1.1/32
```

```
Switch(config-if)# exit
Switch(config)# interface vlan1
Switch(config-if)# dhcp relay source-interface loopback 1
Switch(config-if)#
```

### Related Commands

dhcp-server (interface)

## 4.3.8 dhcp relay information policy

### Command Purpose

To configure the information re-forwarding policy for a DHCP relay agent (what a relay agent should do if a message already contains relay information), use the dhcp relay information policy command in global configuration.

To restore the default relay information policy, use the no form of this command.

### Command Syntax

dhcp relay information policy ( drop | keep | replace )

no dhcp relay information policy

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| drop | Directs the DHCP relay agent to discard messages with existing relay information if the relay information option is already present | - |
| keep | Indicates that existing information is left unchanged on the DHCP relay agent | - |
| replace | Indicates that existing information is overwritten on the DHCP relay agent | - |

### Command Mode

Global Configuration

### Default

The DHCP relay won't change existing relay information.

### Usage

A DHCP relay agent may receive a message from another DHCP relay agent that already contains relay information. By default, this message will be forwarded with the relay information from the previous relay agent untouched.

### Examples

The following example shows how to configure policy of dhcp relay information :

```
Switch# configure terminal
Switch(config)# dhcp relay information policy drop
```

### Related Commands

dhcp relay information option

dhcp relay information policy

## 4.3.9 dhcp relay information policy (interface)

### Command Purpose

If Option 82 policy is configured on interface, the content of option 82 in packet will be processed according to the interface policy, ohterwise it will be processed according to global policy.

### Command Syntax

dhcp relay information policy ( drop | keep | replace )

no dhcp relay information policy

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| drop | Directs the DHCP relay agent to discard messages with existing relay information if the relay information option is already present | - |
| keep | Indicates that existing information is left unchanged on the DHCP relay agent | - |
| replace | Indicates that existing information is overwritten on the DHCP relay agent | - |

## Command Mode

Interface Configuration

## Default

No Option 82 policy is configured on inteface.

## Usage

A DHCP relay agent may receive a message from another DHCP relay agent that already contains relay information. By default, this message will be forwarded with the relay information from the previous relay agent untouched.

## Examples

The following example shows how to configure policy of dhcp relay information :

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# dhcp relay information policy drop
```

## Related Commands

dhcp relay information option

## 4.3.10 dhcp relay information trust-all

### Command Purpose

To configure all interfaces as trusted sources of the DHCP relay agent information option, use the dhcp relay information trust-all command in global configuration mode. To restore these interfaces to their default behavior, use the no form of this command.

### Command Syntax

dhcp relay information trust-all

no dhcp relay information trust-all

### Command Mode

Global Configuration

### Default

All interfaces on the switch are considered entrusted.

### Usage

By default, if the gateway address is set to all zeros in the DHCP packet and the relay information option is already present in the packet, the DHCP relay agent will discard the packet. If the dhcp relay information trust-all command is configured globally, the DHCP relay agent will not discard the packet even if the gateway address is set to all zeros. Instead, the received DHCPDISCOVER or DHCPREQUEST messages will be forwarded to the addresses configured by the dhcp-server command as in normal DHCP relay operation.

### Examples

The following example shows how to configure dhcp relay information trust globally:

```
Switch# configure terminal
Switch(config)# dhcp relay information trust-all
```

### Related Commands

dhcp relay information trusted

## 4.3.11 dhcp relay information trusted

### Command Purpose

To configure an interface as a trusted source of DHCP relay agent information option, use the dhcp relay information trusted command in interface configuration mode. To restore the interface to the default behavior, use the no form of the command.

### Command Syntax

dhcp relay information trusted

no dhcp relay information trusted

### Command Mode

Interface Configuration

### Default

All interfaces on the router are considered entrusted.

### Usage

By default, if the gateway address is set to all zeros in the DHCP packet and the relay information option is already present in the packet, the DHCP relay agent will discard the packet. If the dhcp relay information trusted command is configured globally, the DHCP relay agent will not discard the packet even if the gateway address is set to all zeros. Instead, the received DHCPDISCOVER or DHCPREQUEST messages will be forwarded to the addresses configured by the dhcp-server command as in normal DHCP relay operation.

### Examples

The following example shows how to configure an interface as trusted source of dhcp relay information:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# dhcp relay information trusted
```

### Related Commands

dhcp relay information trust-all

## 4.3.12 dhcp relay gateway

### Command Purpose

To configure the DHCP relay agent address of DHCP packets, use this command in interface configuration mode.

To restore the interface to the default behavior, use the no form of the command.

### Command Syntax

dhcp relay gateway *A.B.C.D*

no dhcp relay gateway

### Command Mode

Interface Configuration

### Default

Default relay agent address is used in DHCP packet.

### Usage

None

### Examples

The following example shows how to configure DHCP relay agent address of DHCP packets:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# dhcp relay gateway 10.10.10.1
```

### Related Commands

dhcp-server (interface)

## 4.3.13 dhcp relay address cycle

### Command Purpose

Use “dhcp relay address cycle” command to enable DHCP relay cycle feature.

Use “no dhcp relay address cycle” to disable the feature.

### Command Syntax

dhcp relay address cycle

no dhcp relay address cycle

### Command Mode

Global Configuration

### Default

DHCP relay cycle is disabled by default.

### Usage

This command is used for DHCP relay. When more than one DHCP servers are configured on a DHCP relay device, relay device should send DHCP DISCOVER packets to all servers by default. In this way, the servers should deal with too much packet and might be overload. To resolve this problem use this command to enable

DHCP relay cycle. After configure this command, DHCP relay device send to only one server when it receive the DHCP DISCOVER packet, and it will change a server to send packet every time after it sent one. Use this method to make all servers to achieve load balance.

### Examples

Enable DHCP relay cycle feature :

```
Switch# configure terminal
Switch(config)# dhcp relay address cycle
```

### Related Commands

None

## 4.3.14 service dhcp

### Command Purpose

To enable the Dynamic Host Configuration Protocol (DHCP) snooping and relay agent features on your router, use the service dhcp command in global configuration mode.

To disable the DHCP snooping and relay agent features, use the no form of this command.

### Command Syntax

service dhcp enable

service dhcp disable

### Command Mode

Global Configuration

### Default

DHCP service is disabled globally.

### Usage

Only the main DHCP service is enabled by the service dhcp command, can other DHCP services be used, such as dhcp relay or dhcp snooping.

### Examples

The following example shows how to enable DHCP service globally:

```
Switch# configure terminal
Switch(config)# service dhcp enable
```

The following example shows how to disable DHCP service globally:

```
Switch# configure terminal
Switch(config)# service dhcp disable
```

### Related Commands

dhcp relay

dhcp snooping

## 4.3.15 debug dhcp relay

### Command Purpose

Use this command to turn on the debug switches of dhcp relay module.

To restore the default, use the no form of this command

### Command Syntax

debug dhcp relay ( events | error | dump | packet | all )

no debug dhcp relay ( events | error | dump | packet | all )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| events | Relay events | - |
| error | Error DHCP message | - |
| packet | DHCP message fields | - |
| dump | Dump message in hex format | - |
| all | Turn all debugging on | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

Use command "terminal monitor" to make debug messages print on the VTY immediately.

Use command "show logging buffer" to check the debug messages in the logging buffer.

## Examples

The following is sample to open dhcp relay debug switches:

```
Switch# debug dhcp relay all
```

## Related Commands

terminal monitor

show logging buffer

# 4.3.16 show dhcp-server

## Command Purpose

To display the DHCP server groups, use the show dhcp-server command in privileged EXEC mode.

## Command Syntax

show dhcp-server

## Command Mode

Privileged EXEC

## Default

None

## Usage

This command is used to display all the DHCP server groups configured with command dhcp-server in global mode.

## Examples

The following example shows how to display dhcp-server group information:

```
Switch# show dhcp-server
DHCP server group information:
------------------------------------------------------------
group 1 ip address list:
    [1] 1.1.1.1
    [2] 2.2.2.2
    [3] 3.3.3.3
    [4] 4.4.4.4
    [5] 5.5.5.5
    [6] 6.6.6.6
    [7] 7.7.7.7
    [8] 8.8.8.8
```

## Related Commands

dhcp-server (global)

# 4.3.17 show dhcp relay interfaces

## Command Purpose

To display to which dhcp-server group the interface belongs, use the show dhcp relay interfaces command in privileged EXEC mode.

## Command Syntax

show dhcp relay interfaces

## Command Mode

Privileged EXEC

## Default

None

## Usage

This command is used to display the interface which is confined DHCP relay.

## Examples

The following example shows how to display dhcp relay interfaces information:

```
Switch# show dhcp relay interfaces
List of DHCP relay enabled interface(s):
DHCP relay service status: enabled
Interface Name          DHCP server group
================================================================
eth-0-1                   1
```

## Related Commands

show dhcp-server

# 4.3.18 show dhcp relay information config

## Command Purpose

To display the DHCP relay information configurations, use the show dhcp relay information config command in privileged EXEC mode.

## Command Syntax

show dhcp relay information config

## Command Mode

Privileged EXEC

## Default

None

## Usage

This command is used to display the configuration of DHCP relay.

## Examples

The following example shows how to display dhcp relay configuration:

```
Switch# show dhcp relay information config
DHCP relay agent information configuration:
============================================================
no dhcp relay information option
dhcp relay information check
dhcp relay information policy keep
```

## Related Commands

dhcp relay information option

# 4.3.19 show dhcp relay information trusted-sources

## Command Purpose

To display all interfaces configured to be a trusted source for the DHCP relay information option, use the show dhcp relay information trusted-sources command in privileged EXEC mode.

## Command Syntax

show dhcp relay information trusted-sources

## Command Mode

Privileged EXEC

### Default

None

### Usage

This command is used to display all interfaces configured to be a trusted source for DHCP relay.

### Examples

The following example shows how to display dhcp relay information trusted-sources:

```
Switch# show dhcp relay information trusted-sources
List of trusted sources of relay agent information option:
============================================================
All interfaces are trusted source of relay agent information option
```

### Related Commands

dhcp relay information trusted

## 4.3.20 show dhcp relay statistics

### Command Purpose

To display the statistics of DHCP packets relayed by the switch, use the show dhcp relay statistics command in privileged EXEC mode.

### Command Syntax

show dhcp relay statistics

### Command Mode

Privileged EXEC

### Default

None

### Usage

This command is used to display detail DHCP statistics which dealt by the switch.

### Examples

The following example shows how to display dhcp relay statistics:

```
Switch# show dhcp relay statistics
DHCP relay packet statistics:
============================================================
Client relayed packets:  101
Server relayed packets:  88
Client error packets:    0
Server error packets:    0
Bogus GIADDR drops:      15
Bad circuit ID packets:  0
Corrupted agent options: 0
Missing agent options:   0
Missing circuit IDs:     0
```

### Related Commands

clear dhcp relay statistics

## 4.3.21 clear dhcp relay statistics

### Command Purpose

To clear the statistics of DHCP packets relayed by the switch, use the clear dhcp relay statistics command in privileged EXEC mode.

### Command Syntax

clear dhcp relay statistics

### Command Mode

Privileged EXEC

### Default

None

### Usage

This command is used to clear detail DHCP statistics which dealt by the switch.

### Examples

The following example shows how to clear dhcp relay statistics:

```
Switch# clear dhcp relay statistics
```

### Related Commands

show dhcp relay statistics

## 4.4 DHCP Server Commands

### 4.4.1 service dhcp

### Command Purpose

To enable or disable the DHCP snooping, server and relay agent features on your router, use the service dhcp command in global configuration mode.

To disable these functions，use the no form of this command.

### Command Syntax

service dhcp enable

service dhcp disable

### Command Mode

Global Configuration

### Default

DHCP service is disabled.

### Usage

Only the main DHCP service is enabled by the service dhcp command, can other DHCP services be used, such as dhcp relay, dhcp server and dhcp snooping.

### Examples

The following example enables dhcp service:

```
Switch# configure terminal
Switch(config)# service dhcp enable
```

The following example disables dhcp service:

```
Switch# configure terminal
Switch(config)# service dhcp disable
```

### Related Commands

dhcp server

dhcp relay

dhcp snooping

## 4.4.2 dhcp-server (global)

### Command Purpose

To enable the DHCP server service, use the dhcp server command in global configuration mode.

To disable this function, use the no form of this command.

### Command Syntax

dhcp server

no dhcp server

### Command Mode

Global Configuration

### Default

DHCP server is disabled.

### Usage

The DHCP service must be enabled with the dhcp server command before DHCP server service can be used.

### Examples

The following is sample output from the dhcp server command:

```
Switch# configure terminal
Switch(config)# dhcp server
```

### Related Commands

service dhcp

dhcp-server (interface)

## 4.4.3 dhcp-server (interface)

### Command Purpose

To specify a L3 interface to act as a DHCP Server, use the dhcp server command in interface configuration mode. To remove the specification, use the no form of this command.

### Command Syntax

dhcp server enable

dhcp server disable

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| enable | Specify a L3 interface to act as a DHCP server | - |
| disable | Remove DHCP server on a L3 interface | - |

### Command Mode

Interface Configuration

### Default

Neither DHCP server nor DHCP relay is specified.

### Usage

This command is used to specify a L3 interface to act as a DHCP Server.

### Examples

The following is sample output from the dhcp server command:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# dhcp server enable
```

### Related Commands

service dhcp

dhcp server(global)

## 4.4.4 dhcp ping packets

### Command Purpose

To configure how many ping packets that are sent before assigning the address to a requesting client, use the dhcp ping packets command in interface configuration mode. To restore the default value, use the no form of this command.

### Command Syntax

dhcp ping packets *NUMBER*

no dhcp ping packets

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NUMBER | Specify the number of ping packets that are sent before assigning the address to a requesting client | 0-10 |

## Command Mode

Global Configuration

## Default

The default value is one packet.

## Usage

The DHCP server pings a pool address before assigning the address to a requesting client. If the ping is unanswered, the DHCP server assumes (with a high probability) that the address is not in use and assigns the address to the requesting client.

## Examples

The following is sample output from the dhcp ping packets command:

```
Switch# configure terminal
Switch(config)# dhcp ping packets 10
```

## Related Commands

service dhcp

dhcp ping timeout

# 4.4.5 dhcp ping timeout

## Command Purpose

To configure how long a DHCP server waits for a ping reply from an address pool; use the dhcp ping timeout command in interface configuration mode.

To restore the default value, use the no form of this command.

## Command Syntax

dhcp ping timeout *NUMBER*

no dhcp ping timeout

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NUMBER | Specifies how long to wait for a ping reply in seconds. | 1-10 seconds |

## Command Mode

Global Configuration

## Default

The default value is waiting for one second.

## Usage

The DHCP server pings a pool address before assigning the address to a requesting client. If the ping is unanswered, the DHCP server assumes (with a high probability) that the address is not in use and assigns the address to the requesting client.

## Examples

The following is sample output from the dhcp ping timeout command:

```
Switch# configure terminal
Switch(config)# dhcp ping timeout 3
```

## Related Commands

service dhcp

dhcp ping packets

# 4.4.6 dhcp pool

## Command Purpose

To configure the information reforwarding policy for a DHCP relay agent (what a relay agent should do if a message already contains relay information), use the dhcp relay information policy command in global configuration.

To restore the default relay information policy, use the no form of this command.

## Command Syntax

dhcp pool *WORD*

no dhcp pool *WORD*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| WORD | WORD: The name of a DHCP pool | 1) the length range should be [1, 32)<br>2) The characters can only include [0-9a-zA-Z.-_]<br>3) The string must starting with alphabetic, ending with alphanumeric or digit |

## Command Mode

Global Configuration

## Default

The default value is DHCP address pools are not configured.

## Usage

During execution, the configuration mode changes to DHCP pool configuration mode, identified by the (config-dhcp)# prompt. In this mode, the administrator can configure pool parameters, like the IP subnet number and default router list.

## Examples

The following is sample output from the dhcp pool command:

```
Switch# configure terminal
Switch(config)# dhcp pool pool1
```

### Related Commands

service dhcp

dhcp select

static-bind

dhcp excluded-address

network (DHCP)

## 4.4.7 static-bind

### Command Purpose

To specify an address binding mapping between the IP address and MAC address of a client, use the static-bind pool configuration command. To remove the address binding mapping, use the no form of this command.

### Command Syntax

static-bind ip-address *IP_ADDR/IP_MASK_LEN* ( agent-circuit-id *IF-NAME* | mac-address *MAC_ADDR* | client-identifier ( ascii *WORD* | hex *HEX_STRING* ) )

static-bind ip-address *IP_ADDR IP_ADDR_MASK* ( agent-circuit-id *WORD* | mac-address *MAC_ADDR* | client-identifier ( ascii *WORD* | hex *HEX_STRING* ) )

no static-bind

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IF-NAME | The interface name for connecting to the client. | Interface name string |
| IP_ADDR | IP address. | IPv4 Address |
| IP_ADDR_MASK | IP-address-type mask | IPv4 Address |
| IP_MASK_LEN | Prefix length for the ip address. | 1-32 |
| mac-address MAC_ADDR | the hardware address of a DHCP client. | MAC Address |
| ascii WORD | the client id as ascii string | String with up to 63 characters |

| | | |
|---|---|---|
| hex HEX_STRING | the client id as hex string | String with up to 126 characters |

## Command Mode

DHCP pool Configuration

## Default

The default value is none address binding mapping specified.

## Usage

You can only configure one manual binding per host pool.

## Examples

The following is sample output from the static-bind command:

```
Switch# configure terminal
Switch(config)# dhcp pool test
Switch(config-dhcp)# static-bind ip 10.10.10.10/24 mac-address 0012.2222.2222
```

## Related Commands

dhcp pool

# 4.4.8 dns-server address

## Command Purpose

To specify the DNS IP servers available to a DHCP client, use the dns-server DHCP pool configuration command. To remove the DNS server list, use the no form of this command.

## Command Syntax

dns-server *A.B.C.D* ( *A.B.C.D*... *A.B.C.D* )

no dns-server

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| A.B.C.D | Specifies the IP address of a DNS server. One IP address is required, although you can specify up to eight addresses in one command line. | IPv4 Address |
| A.B.C.D... A.B.C.D (Optional) | Specifies up to eight addresses in the command line. | IPv4 Address |

## Command Mode

DHCP pool Configuration

## Default

The default value is none DNS IP servers specified.

## Usage

You can specify up to eight servers in the list, Servers are listed in order of preference (address1 is the most preferred server, address2 is the next most preferred server, and so on).

## Examples

The following is sample output from the dns-server command:

```
Switch# configure terminal
Switch(config)# dhcp pool test
Switch(config-dhcp)#  dns-server 1.1.1.1 2.2.2.2
```

## Related Commands

dhcp pool

## 4.4.9 domain-name

### Command Purpose

To specify the domain name for a DHCP client, use the domain-name DHCP pool configuration command. To remove the domain name, use the no form of this command.

### Command Syntax

domain-name *WORD*

no domain-name

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| WORD | specify a domain name suffix in each DHCP address pool on the DHCP server for the clients. | 1) The length range should be [1, 64)<br>2) The characters can only include [0-9a-zA-Z.-_],<br>specify a domain name suffix in each DHCP address pool on the DHCP server for the clients.<br>1) The length range should be [1, 64)<br>2) The characters can only include [0-9a-zA-Z.-_],<br>3) The string must starting with alphabetic, ending with alphanumeric or digit |

### Command Mode

DHCP pool Configuration

### Default

The default value is none domain-name specified.

### Usage

You can specify a domain name suffix in each DHCP address pool on the DHCP serverfor the clients. With this suffix assigned, the client needs only input part of a domainname, and the system will add the domain name suffix for name resolution.

## Examples

The following is sample output from the domain-name command:

```
Switch# configure terminal
Switch(config)# dhcp pool test
Switch(config-dhcp)#  domain-name switch.org
```

## Related Commands

dhcp pool

# 4.4.10 bootfile-name

## Command Purpose

To specify the name of the default boot image for a DHCP client, use the bootfile-name DHCP pool configuration command. To delete the boot image name, use the no form of this command.

## Command Syntax

bootfile-name *WORD*

no bootfile-name

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| WORD | Specifies the name of the file that is used as a boot image. | 1) The length range should be [1, 64)<br>2) The characters can only include [0-9a-zA-Z.-_],<br>Specifies the name of the file that is used as a boot image.<br>1) The length range should be [1, 64)<br>2) The characters can only include [0-9a-zA-Z.-_],<br>3) The string must starting with alphabetic, ending with alphanumeric or digit |

## Command Mode

DHCP pool Configuration

## Default

The default value is none boot file specified.

## Usage

This task is to specify the IP address and name of a TFTP server and the bootfile name in the DHCP address pool. The DHCP clients use these parameters to contact the TFTP server, requesting the configuration file used for system initialization, which is called autoconfiguration.

## Examples

The following example specifies dhclient_startup_config as the name of the boot file:

```
Switch# configure terminal
Switch(config)# dhcp pool test
Switch(config-dhcp)# bootfile dhclient_startup_config
```

## Related Commands

dhcp pool

tftp-server-address

# 4.4.11 tftp-server-address

## Command Purpose

To configure the tftp server in the boot process of a DHCP client, use the tftp-server-address DHCP pool configuration command. To remove the boot server list, use the no form of this command.

## Command Syntax

tftp-server-address *A.B.C.D* ( *A.B.C.D*... *A.B.C.D* )

no tftp-server-address

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| A.B.C.D | Specifies the address of the tftp server address in the boot process, which is typically a Trivial File Transfer Protocol (TFTP) server. One address is required, although you can specify up to eight addresses in one command line. | IPv4 Address |
| A.B.C.D... A.B.C.D (Optional) | Specifies up to eight address in the command line. | IPv4 Address |

## Command Mode

DHCP pool Configuration

## Default

The default value is none tftp-server-address specified.

## Usage

You can specify up to eight servers in the list, Servers are listed in order of preference (address1 is the most preferred server, address2 is the next most preferred server, and so on).

## Examples

The following is sample output from the tftp-server-address command:

```
Switch# configure terminal
Switch(config)# dhcp pool test
Switch(config-dhcp)# tftp-server-address1.1.1.1 2.2.2.2
```

## Related Commands

dhcp pool

bootfile-name

## 4.4.12 gateway address

### Command Purpose

To specify the default router list for a DHCP client, use the gateway DHCP pool configuration command. To remove the default router list, use the no form of this command.

### Command Syntax

gateway *A.B.C.D* ( *A.B.C.D*... *A.B.C.D* )

no gateway

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| A.B.C.D | Specifies the IP address of a DNS server. One IP address is required, although you can specify up to eight addresses in one command line. | IPv4 Address |
| A.B.C.D... A.B.C.D (Optional) | Specifies up to eight addresses in the command line. | IPv4 Address |

### Command Mode

DHCP pool Configuration

### Default

The default value is none gateway servers specified.

### Usage

The IP address of the router should be on the same subnet as the client subnet. You can specify up to eight routers in the list. Routers are listed in order of preference (address1 is the most preferred router, address2 is the next most preferred router, and so on).

## Examples

The following is sample output from the gateway command:

```
Switch# configure terminal
Switch(config)# dhcp pool test
Switch(config-dhcp)# gateway 1.1.1.1 2.2.2.2
```

## Related Commands

dhcp pool

# 4.4.13 netbios-name-server

## Command Purpose

To specify the default router list for a DHCP client, use the netbios-name-server DHCP pool configuration command. To remove the default router list, use the no form of this command.

## Command Syntax

netbios-name-server *A.B.C.D* ( *A.B.C.D*... *A.B.C.D* )

no netbios-name-server

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| A.B.C.D | Specifies the IP address of a DNS server. One IP address is required, although you can specify up to eight addresses in one command line. | IPv4 Address |
| A.B.C.D... A.B.C.D (Optional) | Specifies up to eight addresses in the command line. | IPv4 Address |

## Command Mode

DHCP pool Configuration

## Default

The default value is none NetBIOS WINS name servers specified.

## Usage

You can specify up to eight NetBIOS WINS name servers in the list. NetBIOS WINS name servers are listed in order of preference (address1 is the most preferred server, address2 is the next most preferred server, and so on).

## Examples

The following is sample output from the netbios-name-server command:

```
Switch# configure terminal
Switch(config)# dhcp pool test
Switch(config-dhcp)# netbios-name-server 1.1.1.1 2.2.2.2
```

## Related Commands

dhcp pool

# 4.4.14 netbios-node-type

## Command Purpose

To configure the NetBIOS node type for DHCP clients, use the netbios-node-type DHCP pool configuration command.

To remove the NetBIOS node type, use the no form of this command.

## Command Syntax

netbios-node-type [ b-node | p-node | m-node | h-node ]

no netbios-node-type

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| b-node | Broadcast | - |
| p-node | Peer-to-peer | - |
| m-node | Mixed | - |
| h-node | Hybrid (recommended) | - |

## Command Mode

DHCP pool Configuration

## Default

The default value is none NetBIOS node type specified.

## Usage

You can specify the NetBIOS node type for a DHCP address pool which is used to specify the NetBIOS node type for a DHCP Client.

## Examples

The following is sample output from the netbios-node-type command:

```
Switch# configure terminal
Switch(config)# dhcp pool test
Switch(config-dhcp)# netbios-node-type h-node
```

## Related Commands

dhcp pool

# 4.4.15 network

## Command Purpose

To configure the subnet number and mask for a DHCP address pool on a DHCP Server, use the network DHCP pool configuration command.

To remove the subnet number and mask, use the no form of this command.

## Command Syntax

network [ ip-address wildcard-mask | *ip-address/prefix-length* ]

no network

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ip-address | IP address. | IPv4 Address |
| wildcard-mask | IP-address-type mask that includes “don’t care” bits. | IPv4 Address |
| prefix-length | Prefix length for the network. | 0-32 |

## Command Mode

DHCP pool Configuration

## Default

The default value is none subnet number and mask specified.

## Usage

This command is valid for DHCP subnetwork address pools only.The DHCP server assumes that all host addresses are available. The system administrator can exclude subsets of the address space by using the ip dhcp excluded-address command.Network for one pool cann't the same with other pool's network and can't configure manual bindings within the same pool that is configured with the network command.

## Examples

The following is sample output from the netbios-node-type command:

```
Switch# configure terminal
Switch(config)# dhcp pool test
Switch(config-dhcp)# network 1.1.1.0/24
```

## Related Commands

dhcp pool

# 4.4.16 lease

## Command Purpose

To configure the duration of the lease for an IP address that is assigned from a DHCP Server to a DHCP client, use the lease DHCP pool configuration command. To restore the default value, use the no form of this command.

## Command Syntax

lease *DAYS* ( *HOURS* ( *MINUTES* | ) | )

no lease

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DAYS | Specifies the duration of the lease in numbers of days. | 0-365 days |
| HOURS (Optional) | Specifies the number of hours in the lease. A days value must be supplied before you can configure an hours value. | 0-23 hours |
| MINUTES (Optional) | Specifies the number of minutes in the lease. A day's value and an hours value must be supplied before you can configure a minute's value. | 0-59 minutes |

## Command Mode

DHCP pool Configuration

## Default

The default value is one day.

## Usage

N/A

## Examples

The following example shows a two-day lease:

```
Switch# configure terminal
Switch(config)# dhcp pool test
Switch(config-dhcp)# lease 2
```

The following example shows a one-day and two-hour lease:

```
Switch# configure terminal
Switch(config)# dhcp pool test
Switch(config-dhcp)#  lease 1 2
```

The following example shows a thirty-minute lease:

```
Switch# configure terminal
Switch(config)# dhcp pool test
Switch(config-dhcp)# lease 0 0 30
```

### Related Commands

dhcp pool

## 4.4.17 option

### Command Purpose

To configure DHCP Server options, use the option DHCP pool configuration command.

To remove the options, use the no form of this command.

### Command Syntax

option { code [ ascii ascii-string | hex hex-string | ip-address ip-address ] }

no option [ code ]

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| code | Specifies the DHCP option code, except values 3, 6, 15, 44, 46, 50, 51, 52, 53, 54, 55, 57, 58, 59, 61, 67, 82 and 150. | 2-254 |
| ascii-string | Specifies an NVT ASCII character string. ASCII character strings that contain white space must be delaminated by quotation marks. | String with up to 255 characters |
| hex-string | Specifies dotted-hexadecimal data. Each byte in hexadecimal character strings is two hexadecimal digitse. | String with up to 254 characters, if its length is odd, 0 is added before it. |
| ip-address | Specifies an IP address. | IPv4 Address, at most 8 IPv4 addresses are supported. |

### Command Mode

DHCP pool Configuration

### Default

The default value is none DHCP option specified.

### Usage

DHCP provides a framework for passing configuration information to hosts on a TCP/IP network. Configuration parameters and other control information are carried in tagged data items that are stored in the options field of the DHCP message. The data items themselves are also called options. The current set of DHCP options are documented in RFC 2131, Dynamic Host Configuration Protocol.

Options with specified command line or options that the dhcp server does not need to support are not supported to be configure by the CLI "option". These unsupported options are 3, 6, 15, 44, 46, 50, 51, 52, 53, 54, 55, 57, 58, 59, 61, 67, 82 and 150.

### Examples

The following is sample output from the option command:

```
Switch# configure terminal
Switch(config)# dhcp pool test
Switch(config-dhcp)# option 4 ip-address 10.10.10.10 11.11.11.11
```

### Related Commands

dhcp pool

## 4.4.18 dhcp excluded-address

### Command Purpose

To specify a single IP address or a range of IP addresses which the DHCP Server is not assign to DHCP clients, use the excluded-address DHCP pool configuration command. To remove the IP addresses, use the no form of this command.

## Command Syntax

dhcp excluded-address *A.B.C.D* [ *A.B.C.D* ]

no dhcp excluded-address *A.B.C.D* [ *A.B.C.D* ]

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| A.B.C.D | The excluded IP address, or low IP address in an excluded address range. | IPv4 Address |
| A.B.C.D(Optional) | The high IP address in the excluded address range. | IPv4 Address |

## Command Mode

DHCP pool Configuration

## Default

All IP pool addresses are assignable.

## Usage

The DHCP server assumes that all pool addresses may be assigned to clients. Use this command to exclude a single IP address or a range of IP addresses.

## Examples

The following example shows how to disallow DHCP server distribute the address in the range of 10.10.1.100 -10.10.1.199:

```
Switch# configure terminal
Switch(config)# dhcp pool test
Switch(config-dhcp)#  ip dhcp excluded-address 10.10.1.100 10.10.1.199
```

## Related Commands

dhcp pool

## 4.4.19 show dhcp server conflict

### Command Purpose

To display address conflicts found by a DHCP Server when addresses are offered to the client, use the show dhcp server conflict in privileged EXEC mode.

### Command Syntax

show dhcp server conflict [ ip *A.B.C.D* | all ]

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ip A.B.C.D | Specifies the IP address of the conflict found. | IPv4 Address |
| all | Specifies all IP address of the conflict found. | - |

### Command Mode

Privileged EXEC

### Default

None

### Usage

The server detects conflicts using ping. The client detects conflicts using gratuitous Address Resolution Protocol (ARP). If an address conflict is detected, the address is removed from the pool and the address will not be assigned until an administrator resolves the conflict.

### Examples

The following example displays the detection method and detection time for all IP addresses the DHCP server has offered that have conflicts with other devices:

```
Switch# show ip dhcp conflict all
```

### Related Commands

clear dhcp server conflict

dhcp ping packets

dhcp ping timeout

## 4.4.20 show dhcp server binding

### Command Purpose

To display address bindings on a DHCP Server, use the show dhcp server binding in privileged EXEC command.

### Command Syntax

show dhcp server binding [ ip *A.B.C.D* | pool *WORD* | all ]

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ip A.B.C.D | Specifies the IP address of the conflict found. | IPv4 Address |
| pool WORD | Specifies the pool name where the IP address of the conflict found. | String with up to 31 characters |
| all | Specifies all conflict IP address. | - |

### Command Mode

Privileged EXEC

### Default

None

### Usage

The binding address parameters including an IP address, an associated MAC address, a lease expiration date, and the type of address assignment that have occurred.

### Examples

The following examples show the DHCP binding address parameters:

```
Switch# show ip dhcp binding 1.1.1.1
```

### Related Commands

clear dhcp server binding

## 4.4.21 show dhcp server statistics

### Command Purpose

To display DHCP Server statistics, use the show dhcp server statistics in privileged EXEC command.

### Command Syntax

show dhcp server statistics

### Command Mode

Privileged EXEC

### Default

None

### Usage

N/A

### Examples

The following example displays DHCP server statistics:

```
Switch#show dhcp server statistics
DHCP server packet statistics:
=============================================================
Message Received
BOOTREQUEST         12
```

```
DHCPDISCOVER    200
DHCPREQUEST         178
DHCPDECLINE         0
DHCPRELEASE         0
DHCPINFORM      0
Message Sent
BOOTREPLY       12
DHCPOFFER       190
DHCPACK             172
DHCPNAK             6
```

### Related Commands

clear dhcp server statistics

## 4.4.22 show dhcp server config

### Command Purpose

To display the DHCP server configurations, use the show dhcp server config privileged EXEC command .

### Command Syntax

show dhcp server config

### Command Mode

Privileged EXEC

### Default

None

### Usage

This command is used to display the configuration of DHCP server.

### Examples

The following is sample output from the show dhcp server config command:

```
Switch# show dhcp server config
DHCP server configuration:
============================================================
Pool name: pool10
network 10.1.1.0 mask 255.255.255.0
gateway 10.1.1.1
```

### Related Commands

N/A

## 4.4.23 clear dhcp server conflict

### Command Purpose

To clear an address conflict from the DHCP server database, use the clear dhcp server conflict privileged EXEC command.

### Command Syntax

clear dhcp server conflict [ ip *A.B.C.D* | all ]

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ip A.B.C.D | The IP address of the host that contains the conflicting address you want to clear. | IPv4 Address |
| all | Clear all conflicting address. | - |

### Command Mode

Privileged EXEC

### Default

None

### Usage

N/A

## Examples

The following example shows an address conflict of 1.1.1.99 being deleted from the DHCP server database:

```
Switch# clear ip dhcp conflict 1.1.1.99
```

## Related Commands

show dhcp server conflict

# 4.4.24 clear dhcp server binding

## Command Purpose

To delete an automatic address binding from the DHCP Server database, use the clear dhcp server binding in privileged EXEC command.

## Command Syntax

clear dhcp server binding [ ip *A.B.C.D* | pool *WORD* | all ]

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ip A.B.C.D | The address of the binding you want to clear. | IPv4 Address |
| pool WORD | Specifies the pool name where the IP address of the conflict found. | String with up to 31 characters |
| all | Clears all automatic bindings. | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

N/A

### Examples

The following example deletes the address binding 1.1.1.99 from a DHCP server database:

```
Switch# clear ip dhcp binding 1.1.1.99
```

### Related Commands

show dhcp server binding

## 4.4.25 clear dhcp server statistics

### Command Purpose

To reset all DHCP server counters, use the clear dhcp server statistics privileged EXEC command.

### Command Syntax

clear dhcp server statistics

### Command Mode

Privileged EXEC

### Default

None

### Usage

N/A

### Examples

The following example resets all DHCP counters to zero:

```
Switch# clear dhcp server statistics
```

### Related Commands

clear dhcp server statistics

## 4.4.26 show dhcp server pool

### Command Purpose

To display utilization of pool resources, use the show dhcp server pool in privileged EXEC mode.

### Command Syntax

show dhcp server pool ( *WORD* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| WORD | Specifies the pool name to display pool utilization. | String with up to 31 characters |

### Command Mode

Privileged EXEC

### Default

None

### Usage

N/A

### Examples

The following example shows resource utilization of a dhcp pool.:

```
Switch# show dhcp server pool pool1
 Pool                          : pool1
 Type                          : Dynamic
 Lease                         : 0 Days 0 Hours 5 Minutes
 Total addresses               : 254
 Leased addresses              : 1
 Excluded addresses            : 1
 Free addresses                : 252
```

```
Conflict addresses             : 0
Current index        IP address range                    Leased/Excluded/Total
2.1.1.5              2.1.1.1         - 2.1.1.254          1    /1    /254
============================================================
```

### Related Commands

None

## 4.5 DNS Commands

### 4.5.1 ip host

### Command Purpose

To define static hostname-to-address mappings in the Domain Name System (DNS) hostname cache for a DNS view, use the ip host command in global configuration mode. If the hostname cache does not exist yet, it is automatically created.

To remove a hostname-to-address mapping, use the no form of this command.

### Command Syntax

ip host *HOSTNAME IP_ADDR*

no ip host hostname

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| HOSTNAME | Name of the host | String with up to 63 characters |
| IP_ADDR | Associated host IP address | IPv4 Address |

### Command Mode

Global Configuration

### Default

No static hostname-to-address mapping is added to the DNS hostname cache for a DNS view.

### Usage

None

### Examples

The following example shows how to add a mapping entry to the global hostname cache and then remove one of those entries from the global hostname cache:

```
Switch# configure terminal
Switch(config)# ip host www.example1.com 192.0.2.141
```

### Related Commands

show ip host

## 4.5.2 dns domain

### Command Purpose

To specify the default domain for a Domain Name System (DNS) view to use to complete unqualified hostnames (names without a dotted-decimal domain name), use the dns domain command in global configuration mode.

To remove the specification of the default domain name for a DNS view, use the no form of this command.

### Command Syntax

dns domain *DOMAIN-NAME*

no dns domain *DOMAIN-NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DOMAIN-NAME | Name of the domain | String with up to 63 characters |

### Command Mode

Global Configuration

## Default

No default domain name is defined for the DNS view.

## Usage

None

## Examples

The following example shows how to specify the default domain for DNS:

```
Switch# configure terminal
Switch(config)# dns domain www.example1.com
```

## Related Commands

show dns domain

# 4.5.3 dns server

## Command Purpose

To add a name server to the list of Domain Name System (DNS) name servers, use the dns server command in global configuration mode. To remove a DNS name server from the list, use the no form of this command.

## Command Syntax

dns server *IP_ADDR* ( source-interface *IFNAME* | source-ip *A.B.C.D* | )

no dns server *IP_ADDR*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IP_ADDR | IP address of a DNS name server | Support IPv4/IPv6 Address |
| IFNAME | Name of source interface | Support physical/aggregation/loopback/tunnel/vlan ports |
| A.B.C.D | Source IP address | IPv4 Address |

### Command Mode

Global Configuration

### Default

No IP address is explicitly added to the list of resolving name servers for this view.

### Usage

This command can be entered multiple times to specify a maximum of three resolving name servers. After three resolving name servers have been specified, additional resolving name servers cannot be specified unless an existing entry is removed.

If the source interface or source IP address is specified, the packet transmit will use the related IP address as source address.

### Examples

The following example shows how to specify the DNS server list:

```
Switch# configure terminal
Switch(config)# dns server 10.10.1.1
Switch(config)# dns server 20.20.2.2
```

### Related Commands

show dns server

## 4.5.4 show dns

### Command Purpose

To display configuration information about a Domain Name System (DNS) view, use the show dns command in privileged EXEC mode.

### Command Syntax

show dns { domain | server }

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| domain | Display DNS domain list | - |
| server | Display DNS server list | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following is sample output from the show dns domain command:

```
Switch# show dns domain
Current DNS domain configuration:
     Domain                 Suffix
----------------------------------------
1    domain                 domain.com
2    domain                 aa.com
```

## Related Commands

dns server

dns domain

# 4.5.5 show ip host

## Command Purpose

To display configuration information about an ip host view, use the show ip host command in privileged EXEC mode.

## Command Syntax

show ip host

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following is sample output from the show ip host command:

```
Switch# show ip host
Current IP host configuration:
     Host                          Address
-----------------------------------------------------------------
1    www.sampledomain.com          1.1.1.1
```

## Related Commands

ip host

# 5 IPv6 Service Commands

## 5.1 Tunnel Commands

### 5.1.1 interface

#### Command Purpose

Use this command to create a new tunnel interface.

Use the no form of this command to destroy the tunnel interface.

#### Command Syntax

interface tunnel *TUNNEL-ID*

no interface tunnel *TUNNEL-ID*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| TUNNEL-ID | The tunnel id | 0-1023 |

#### Command Mode

Global Configuration

#### Default

None

#### Usage

Before connect 2 IPv6 networks by an IPv4 network, a tunnel interface is required. The tunnel is available after set some attributes. After IPv6 is enabled the tunnel interface can forward IPv6 packets.

## Examples

This example shows how to create a tunnel interface:

```
Switch# configure terminal
Switch(config)# interface tunnel 1
```

## Related Commands

show interface tunnel

# 5.1.2 tunnel mode

## Command Purpose

Use this command to specify the IPv6 transition tunnel protocol.

Use the no form of this command to unset the tunnel protocol.

## Command Syntax

tunnel mode tunnel mode ( erspan ( ecmp-dst-gre | ) | gre | ipv6ip ) ( 6to4 | isatap | )

no tunnel mode

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| 6to4 | Set the tunnel as automatic tunnel 6to4, which use 2002::/16 as its prefix | - |
| isatap | Set the tunnel as automatic tunnel ISATAP, which use ::5efe:a.b.c.d as its suffix | - |
| gre | When the destination of tunnel is single, the mode of the tunnel | - |
| ecmp-dst-gre | When the destinations of tunnel are multi, the mode of the tunnel | - |

## Command Mode

Interface Configuration

## Default

None

## Usage

This command specifies a tunnel encapsulation mode for IPv6 in IPv4. When the keywords "6to4" or "isatap" is not specified, then it is a manual tunnel. Tunnel mode is not allowed to change from 6to4 to ISATAP when 6to4 relay routes are configured. Users should unset the tunnel destination before change from manual tunnel to automatic tunnel.

## Examples

This example shows how to create a 6to4 Tunnel:

```
Switch# configure terminal
Switch(config)# interface tunnel 1
Switch(config-if)# tunnel mode ipv6ip 6to4
```

## Related Commands

tunnel source

tunnel destination

# 5.1.3 tunnel source

## Command Purpose

Use this command to specify the tunnel source. Use the no form of this command to unset the tunnel source.

## Command Syntax

tunnel source ( *IP_ADDR* | *IFNAME* )

no tunnel source

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IP_ADDR | Specify a tunnel source in the IPv4 address format | IPv4 Address |

| | | |
|---|---|---|
| IFNAME | Specify a tunnel source in the IFNAME format, the IFNAME should be layer3 interface | Support physical/aggregation/loopback/vlan/ ports |

## Command Mode

Interface Configuration

## Default

None

## Usage

Every tunnel must have a tunnel source. If users specify the IFNAME format, system will choose the primary address as tunnel source.

## Examples

This example shows how to set the tunnel source:

```
Switch# configure terminal
Switch(config)# interface tunnel 1
Switch(config-if)# tunnel source 3.3.3.3
```

## Related Commands

tunnel mode ipv6ip

tunnel destination

# 5.1.4 tunnel destination

## Command Purpose

Use this command to specify a tunnel destination address in an IPv4 portion.

Use the no parameter to un-specify the address.

## Command Syntax

tunnel destination *IP_ADDR*

no tunnel destination

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IP_ADDR | Specify the tunnel destination IPv4 address | IPv4 Address |

## Command Mode

Interface Configuration

## Default

None

## Usage

Automatic tunnel such as 6to4 and ISATAP must not configure tunnel destination.

## Examples

This example shows how to set the tunnel destination:

```
Switch# configure terminal
Switch(config)# interface tunnel 1
Switch(config-if)# tunnel destination 4.4.4.4
```

## Related Commands

tunnel source

tunnel mode ipv6ip

# 5.1.5 tunnel enable

## Command Purpose

Use this command to enable tunnel decapsulation for interfaces. Use the form of this command to restore the default configuration.

## Command Syntax

tunnel ( enable | disable )

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| enable | Enable tunnel decapsulation | - |
| disable | Disable tunnel decapsulation | - |

### Command Mode

Interface Configuration

### Default

By default, tunnel decapsulation is disabled on all interfaces.

### Usage

None

### Examples

This example shows how to enable tunnel decapsulation on interface eth-0-1:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# tunnel enable
```

### Related Commands

interface

## 5.1.6 tunnel ecmp-destination

### Command Purpose

Use this command to configure tunnel ECMP destinations IP address.

Use the form of this command to unset this configuration.

### Command Syntax

tunnel ecmp-destination *IP_ADDR*

no tunnel ecmp-destination *IP_ADDR*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IP_ADDR | ECMPdestinations IP address | IPv4 Address |

## Command Mode

Interface Configuration

## Default

None

## Usage

Automatic tunnel such as 6to4 and ISATAP must not configure tunnel destination (multi destination).

## Examples

This example shows how to enable tunnel decapsulation on interface tunnel 1:

```
Switch# configure terminal
Switch(config)# interface tunnel 1
Switch(config-if)# tunnel ecmp-destination 1.1.1.1
Switch(config-if)# tunnel ecmp-destination 2.2.2.2
```

## Related Commands

tunnel source

tunnel mode (ecmp-dst-gre | ) | gre)

# 5.1.7 tunnel gre key

## Command Purpose

Use this command to configure the tunnel gre key value.

Use the form of this command to unset this configuration

## Command Syntax

tunnel gre key *KEY_VALUE*

no tunnel gre key

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| KEY_VALUE | gre key value | 1-4294967295 |

## Command Mode

Interface Configuration

## Default

None

## Usage

Improve the security of the gre tunnel, configure the gre key to do the checkout of point to point.

## Examples

This example shows how to enable tunnel decapsulation on interface tunnel 1:

```
Switch# configure terminal
Switch(config)# interface tunnel 1
Switch(config-if)# tunnel gre key 100
```

## Related Commands

show running-config interface tunnel

# 5.1.8 tunnel extend-header

## Command Purpose

Before the mirror traffic passes through the tunnel, encapsulate the traffic with the extend header.

Use no the form of this command to unset this configuration.

## Command Syntax

tunnel extend-header

no tunnel extend-header

## Command Mode

Interface Configuration

## Default

None

## Usage

- spanExtendHeaderCopyHash, using the new hash or not;
- PacketInfo.skipTimeInfoUpdate, fixed with 1;
- if spanExtendHeaderCopyHash is 1, the filed consist with hash (8 bit) and 0 (8 bit); if spanExtendHeaderCopyHash is 0, the filed consist with source port of the mirror (16 bit).

  Without dst-load-balance parameter, spanExtendHeaderCopyHash will be 0, and extend-header field does not contain the hash value;

  with dst-load-balance parameter, spanExtendHeaderCopyHash will be 1, and extend-header field contain the hash value.

## Examples

This example shows how to enable extend-header hash for load balance:

```
Switch# configure terminal
Switch(config)# interface tunnel 1
Switch(config-if)# tunnel extend-header
Switch(config-if)# tunnel extend-header dst-load-balance
```

## Related Commands

show running-config interface tunnel

# 5.1.9 tunnel extend-header id

## Command Purpose

Use this command to configure the extend header id.

Use the no form of this command to unset this configuration.

## Command Syntax

tunnel extend-header id *ID_VALUE*

no tunnel extend-header id *ID_VALUE*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ID_VALUE | The extend header id value | 1-1023 |

## Command Mode

Interface Configuration

## Default

0

## Usage

None

## Examples

This example shows how to enable tunnel decapsulation on interface tunnel 1:

```
Switch# configure terminal
Switch(config)# interface tunnel 1
Switch(config-if)# tunnel extend-header id 30
```

## Related Commands

show running-config interface tunne

# 5.1.10 tunnel dscp

## Command Purpose

Use this command to specify a value of Differentiated Services Code Point (DSCP) in the tunnel IPv4 encapsulation header.

Use the no parameter to inheriting the underlying physical interface value by default.

## Command Syntax

tunnel dscp *DSCP*

no tunnel dscp

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DSCP | The outer IPv4 header DSCP value | 0-63 |

## Command Mode

Interface Configuration

## Default

By default, the DSCP value is inherited from original IPv6 packet.

## Usage

None

## Examples

This example shows how to set the outer IPv4 header DSCP value as 40:

```
Switch# configure terminal
Switch(config)# interface tunnel 1
Switch(config-if)# tunnel dscp 40
```

### Related Commands

interface

## 5.1.11 tunnel ttl

### Command Purpose

Use this command to specify a value of time to live (TTL) in the tunnel IPv4 encapsulation header.

Use the no parameter to inheriting the underlying physical interface value by default.

### Command Syntax

tunnel ttl *TTL*

no tunnel *TTL*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| TTL | The outer IPv4 header TTL value | 1-254 |

### Command Mode

Interface Configuration

### Default

By default, the TTL value is inherited from original IPv6 packet.

### Usage

None

### Examples

This example shows how to set the outer IPv4 header TTL value as 254:

```
Switch# configure terminal
Switch(config)# interface tunnel 1
Switch(config-if)# tunnel ttl 254
```

### Related Commands

interface

## 5.1.12 ipv6 mtu

### Command Purpose

Use this command to specify the Tunnel interface MTU.

Use the no form of this command to restore to the default value.

### Command Syntax

ipv6 mtu *MTU*

no ipv6 mtu

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MTU | Set the tunnel interface MTU | 1280-9500 |

### Command Mode

Interface Configuration

### Default

1480

### Usage

System does not support Path MTU Discovery on tunnel interface. This command is only allowed on tunnel interface.

### Examples

This example sets the tunnel interface MTU to 1280:

```
Switch# configure terminal
Switch(config)# interface tunnel 1
Switch(config-if)# ipv6 mtu 1280
```

### Related Commands

tunnel ttl

## 5.1.13 show interface tunnel

### Command Purpose

Use this command to display the tunnel information.

### Command Syntax

show interface tunnel *TUNNEL-ID*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| TUNNEL-ID | The tunnel id | 0-1023 |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example displays the tunnel information:

```
Switch# show interface tunnel1
Interface tunnel1
  Interface current state: UP
  Hardware is Tunnel
  Index 8193 , Metric 1 , Encapsulation TUNNEL
  VRF binding: not bound
```

```
Tunnel protocol/transport IPv6/IP, Status Valid
Tunnel source 1.1.1.1(eth-0-1), destination 2.2.2.2
Tunnel DSCP inherit,  Tunnel TTL 64
Tunnel transport MTU 1480 bytes
```

### Related Commands

show ipv6 interface tunnel

## 5.1.14 show resource tunnel

### Command Purpose

Use this command to display the tunnel peers resource information.

### Command Syntax

show resource tunnel

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example displays the tunnel peers resource information:

```
Switch# show resource tunnel
Tunnel
Resource                        Used          Capability
============================================================
Peers                           1             8
```

### Related Commands

None

# 5.2 NDP Commands

## 5.2.1 ipv6 neighbor

### Command Purpose

Use this command to configure a static neighbor entry.

To delete the static neighbor entry, user the no form of this command.

### Command Syntax

ipv6 neighbor ( vrf *NAME* | ) *IPV6_ADDR MAC* ( *IFNAME* | )

no ipv6 neighbor ( vrf *NAME* | ) *IPV6_ADDR* ( *IFNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| vrf NAME | vrf instance name | String with up to 31 characters |
| IPV6_ADDR | IPv6 address in X:X::X:X format | IPv6 Address |
| MAC | MAC address in HHHH.HHHH.HHHH format | MAC Address |
| IFNAME | Interface name | Support physical/aggregation/loopback/vlan/tunnel ports |

### Command Mode

Global Configuration

### Default

By default, there is not any static ipv6 neighbor entry exist.

## Usage

Use this command to configure a static neighbor entry. If the IPv6 address is link-local, the interface name must be specified.

Using the no form of this command should not remove any dynamic neighbor entries.

## Examples

This example shows how to add a static neighbor entry:

```
Switch# configure terminal
Switch(config)# ipv6 neighbor 2001::1 0000.0000.0001
Switch(config)# ipv6 neighbor vrf a fe80::1 0000.0000.0002 eth-0-1
```

## Related Commands

show ipv6 neighbors

# 5.2.2 clear ipv6 neighbors

## Command Purpose

Use this command to clear the dynamic neighbor entries.

## Command Syntax

clear ipv6 neighbors ( vrf *NAME* | ) ( interface *IFNAME* | )

clear ipv6 neighbors ( vrf *NAME* | ) *IPV6_ADDR* ( interface *IFNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| vrf NAME | vrf instance name | String with up to 31 characters |
| interface IFNAME | Clear neighbor cache on the interface | Support physical/aggregation/loopback/vlan/tunnel ports |
| IPV6_ADDR | IPv6 address in X:X::X:X format. Clear IPv6 neighbor cache by address | IPv6 Address |

### Command Mode

Privileged EXEC

### Default

None

### Usage

Use this command to clear the dynamic neighbor entries.

User can clear dynamic ipv6 address by interface or address. If the specified address is link-local, the interface is required.

### Examples

This example shows how to clear the neighbor entries:

```
Switch# clear ipv6 neighbors
```

### Related Commands

show ipv6 neighbors

## 5.2.3 ipv6 hop-limit

### Command Purpose

Use this command to set the ipv6 hop limit of the packets.

To restore the default configuration, use the no form of this command.

### Command Syntax

ipv6 hop-limit *HOP_LIMIT*

no ipv6 hop-limit

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| hop-limit HOP_LIMIT | Hop limit. | 1-255 |

### Command Mode

Global Configuration

### Default

By default, the value is 64.

### Usage

The hop limit setting should affect all IPv6 packets send from this device, unless the hop-limit is overwritten by up layer application, for example, OSPF, etc.

### Examples

This example shows how to set the hop limit:

```
Switch# configure terminal
Switch(config)# ipv6 hop-limit 255
```

### Related Commands

None

## 5.2.4 ipv6 nd ra hop-limit

### Command Purpose

Use this command to set the "Current hop limit" in RA packets.

To restore the default configuration, use the no form of this command.

### Command Syntax

ipv6 nd ra hop-limit *HOP_LIMIT*

no ipv6 nd ra hop-limit

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| hop-limit HOP_LIMIT | Set cur hop limit. | 0-255 |

### Command Mode

Interface Configuration

### Default

By default, the value is 0.

### Usage

None

### Examples

This example shows how to set the “Current hop limit” in RA packets:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ipv6 nd ra hop-limit 255
```

### Related Commands

None

## 5.2.5 ipv6 nd dad attempts

### Command Purpose

Use this command to set the attempt times of DAD (Duplicate Address Detect).

To restore the default configuration, use the no form of this command.

### Command Syntax

ipv6 nd dad attempts *DAD_ATTEMPTS*

no ipv6 nd dad attempts

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DAD_ATTEMPTS | Set attempts number. | 0-600 |

### Command Mode

Interface Configuration

### Default

By default, the value is 1.

### Usage

Use this command to set the attempt times of DAD (Duplicate Address Detect). “0” means DAD feature is disabled

### Examples

This example shows how to set the dad attempt:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ipv6 nd dad attempts 3
```

### Related Commands

None

## 5.2.6 ipv6 nd ns-interval

### Command Purpose

Use this command to set the interval of NS packets.

To restore the default configuration, use the no form of this command.

### Command Syntax

ipv6 nd ns-interval *NS_INTERVAL*

no ipv6 nd ns-interval

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NS_INTERVAL | Set IPv6 neighbor solicitation interval. | 1000-3600000 milliseconds |

### Command Mode

Interface Configuration

### Default

By default, the value is 1000

### Usage

This configuration should affect the interval of NS packet during the DAD period or neighbor discovery period.

### Examples

This example shows how to set the ns interval:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ipv6 nd ns-interval 2000
```

### Related Commands

None

## 5.2.7 ipv6 nd ra suppress

### Command Purpose

Use this command to enable the RA suppress function.

To disable this function, use the no form of this command.

### Command Syntax

ipv6 nd ra suppress

no ipv6 nd ra suppress

### Command Mode

Interface Configuration

## Default

By default, RA suppress is enabled.

## Usage

When RA suppress function is enabled, no RA/RS packet should be sent from this interface even a RS packet is received.

## Examples

This example shows how to enable the RA suppress function:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ipv6 nd ra suppress
```

This example shows how to disable the RA suppress function:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no ipv6 nd ra suppress
```

## Related Commands

ipv6 nd ra interval

ipv6 nd ra lifetime

# 5.2.8 ipv6 nd ra mtu suppress

## Command Purpose

Use this command to enable the RA MTU suppress function.

To disable this function, use the no form of this command.

## Command Syntax

ipv6 nd ra mtu suppress

no ipv6 nd ra mtu suppress

### Command Mode

Interface Configuration

### Default

By default, RA MTU suppress is disabled.

### Usage

When RA MTU suppress function is enabled, no MTU option should be sent in the RA packets from this interface.

### Examples

This example shows how to enable the RA MTU suppress function:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ipv6 nd ra mtu suppress
```

This example shows how to disable the RA MTU suppress function:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no ipv6 nd ra mtu suppress
```

### Related Commands

None

## 5.2.9 ipv6 nd ra interval

### Command Purpose

Use this command to set the interval of the RA packets.

To restore the default configuration, use the no form of this command.

### Command Syntax

**ipv6 nd ra interval** *MAX* ( *MIN* | )

**no ipv6 nd ra interval**

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MAX | RA max interval (sec). | 4-1800 seconds |
| MIN | RA min interval (sec). | 3-1350 seconds |

### Command Mode

Interface Configuration

### Default

By default, MAX interval should be 600 second; MIN interval should be 0.33*MAX.

### Usage

The valid range should be between 4 and 1800 second for the max value. The valid range should be between 3 and 0.75 * MAX for the minimum value.

If the minimum value is not specified, it should be 0.33*MAX when MAX >= 9, and it should be equal to the MAX when MAX < 9.

### Examples

This example shows how to set the RA interval:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ipv6 nd ra interval 300
```

### Related Commands

ipv6 nd ra suppress

ipv6 nd ra lifetime

## 5.2.10 ipv6 nd ra lifetime

### Command Purpose

Use this command to set the life time of the RA packets.

To restore the default configuration, use the no form of this command.

## Command Syntax

ipv6 nd ra lifetime *LIFE_TIME*

no ipv6 nd ra lifetime

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LIFE_TIME | Set IPv6 router advertisement lifetime. | 0-9000 seconds |

## Command Mode

Interface Configuration

## Default

By default, RA life time is 3* MAX RA interval.

## Usage

None

## Examples

This example shows how to set the ra life time:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ipv6 nd ra lifetime 1000
```

## Related Commands

ipv6 nd ra suppress

ipv6 nd ra interval

# 5.2.11 ipv6 nd reachable-time

## Command Purpose

Use this command to set reachable time of the neighbor entries.

To restore the default configuration, use the no form of this command.

## Command Syntax

ipv6 nd reachable-time *REACHABLE_TIME*

no ipv6 nd reachable-time

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| REACHABLE_TIME | Reachability time in milliseconds. | 0-3600000 milliseconds |

## Command Mode

Interface Configuration

## Default

By default, the value is 30000 ms

## Usage

A reachable time 0 means to restore the default value 30000.

After the reachable time expired, the neighbor entries which state is "REACH" should change to "STALE".

## Examples

This example shows how to set the reachable time:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ipv6 nd reachable-time 3600000
```

## Related Commands

None

# 5.2.12 ipv6 nd managed-config-flag

## Command Purpose

Use this command to set "Managed address configuration" flag.

To unset this configuration, use the no form of this command.

### Command Syntax

ipv6 nd managed-config-flag

no ipv6 nd managed-config-flag

### Command Mode

Interface Configuration

### Default

By default, the “Managed address configuration” is not set.

### Usage

None

### Examples

This example shows how to set the “Managed address configuration” flag:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ipv6 nd managed-config-flag
```

### Related Commands

ipv6 nd other-config-flag

## 5.2.13 ipv6 nd other-config-flag

### Command Purpose

Use this command to set the “Other configuration” flag.

To unset this configuration, use the no form of this command.

### Command Syntax

ipv6 nd other-config-flag

no ipv6 nd other-config-flag

### Command Mode

Interface Configuration

### Default

By default, the "Other configuration" flag is not set.

### Usage

None

### Examples

This example shows how to set the "Other configuration" flag:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ipv6 nd other-config-flag
```

### Related Commands

ipv6 nd managed-config-flag

## 5.2.14 ipv6 nd prefix

### Command Purpose

Use this command to set prefix for route advertise (RA).

To unset a prefix to advertise, use the no form of this command.

### Command Syntax

ipv6 nd prefix *IPv6_PREFIX* ( *VALID_TIME* | infinite ) ( *PERFERRED_TIME* | infinite ) ( { off-link | no-autoconfig } | )

no ipv6 nd prefix *IPv6_PREFIX*

ipv6 nd prefix default ( *VALID_TIME* | infinite ) ( *PERFERRED_TIME* | infinite ) ( { off-link | no-autoconfig } | )

no ipv6 nd prefix default

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IPv6_PREFIX | Configure IPv6 routing prefix advertisement. IPv6 prefix in X:X::X:X/M format | IPv6 Address and mask length |
| VALID_TIME | Valid lifetime. | 0-4294967295 second |
| PERFERRED_TIME | Preferred lifetime. | 0-4294967295 second |

## Command Mode

Interface Configuration

## Default

The valid range of valid life time should be between 0 and 4294967295 seconds. User can also use the keyword “infinite” to indicate the value 4294967295(0xFFFFFFFF）. The default value should be 2592000 seconds (30 days).

The valid range of preferred life time should be between 0 and 4294967295 seconds. User can also use the keyword “infinite” to indicate the value 4294967295（0xFFFFFFFF）. The default value should be 604800 seconds (7 days).

## Usage

None

## Examples

This example shows how to set the prefix:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ipv6 nd prefix 2001::1/64 3000 3000
```

### Related Commands

show ipv6 interface IFNAME prefix

## 5.2.15 show ipv6 interface IFNAME prefix

### Command Purpose

Use this command to show the prefix for route advertise (RA) on the specified interface.

### Command Syntax

show ipv6 interface *IFNAME* prefix

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | Name of the interface to show | Support physical/aggregation/loopback/vlan/tunnel ports |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows the result of this command:

```
Switch# show ipv6 interface eth-0-1 prefix
```

### Related Commands

ipv6 nd prefix

# 5.2.16 show ipv6 neighbors

## Command Purpose

Use this command to show all ipv6 neighbor entries.

## Command Syntax

show ipv6 neighbors ( dynamic | static | interface *IFNAME* | *IPV6_ADDR* | statistics | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| interface IFNAME | Name of the interface to show | Support physical/aggregation/loopback/vlan/tunnel ports |
| IPV6_ADDR | IPv6 address in X:X::X:X format | IPv6 Address |

## Command Mode

Privileged EXEC

## Default

None

## Usage

Neighbor entries should be able to show globally, by interface, or by prefix. Dynamic and static entries can be displayed separately.

## Examples

This example shows the result of this command:

```
Switch# show ipv6 neighbors
IPv6 address                              Age      Link-Layer Addr State Interface
2001::2                                     7        40f2.fd60.ac00  REACH eth-0-9
fe80::42f2:fdff:fe60:ac00                 6        40f2.fd60.ac00  STALE eth-0-9
```

### Related Commands

ipv6 neighbor

## 5.2.17 debug ipv6 nd

### Command Purpose

Use this command to open the debug of ipv6 ND feature.

To close the debug of ipv6 ND feature, use the no form of this command.

### Command Syntax

debug ipv6 nd ( packet | events | error | dump | info | all )

no debug ipv6 nd ( packet | events | error | dump | info | all )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| packet | IPv6 ND packet | - |
| events | IPv6 ND events | - |
| error | IPv6 ND Error message | - |
| dump | Dump message in hex format | - |
| info | IPv6 ND information | - |
| all | Turn all debugging on | - |

### Command Mode

Privileged EXEC

### Default

By default, the ipv6 nd debug is closed.

### Usage

None

### Examples

This example shows how to open the ipv6 ND debug:

```
Switch# debug ipv6 nd all
Switch# terminal monitor
```

### Related Commands

None

## 5.3 DHCPv6 Relay Commands

### 5.3.1 dhcpv6 relay

### Command Purpose

To enable the DHCPv6 relay service, use the dhcpv6 relay command in global configuration mode.

To disable this function, use the no form of this command.

### Command Syntax

dhcpv6 relay

no dhcpv6 relay

### Command Mode

Global Configuration

### Default

DHCPv6 relay is disabled.

### Usage

The DHCPv6 service must be enabled with the dhcpv6 service command before DHCPv6 relay service can be used.

## Examples

The following example shows how to enable DHCPv6 relay agent:

```
Switch# configure terminal
Switch(config)# dhcpv6 relay
```

## Related Commands

service dhcpv6

# 5.3.2 dhcpv6-server (global)

## Command Purpose

To create a DHCPv6 server group, use the dhcpv6-server command in global configuration mode.

To remove a DHCPv6 server group, use the no form of this command.

## Command Syntax

dhcpv6-server *NUMBER IPV6_ADDR* interface *IFNAME*

no dhcpv6-server *NUMBER* ( *IPV6_ADDR* ( interface *IFNAME* | ) | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NUMBER | Number of the DHCPv6 server group. The range is from 1 to 16 | 1-16 |
| IPV6_ADDR | The IPv6 address list of the DHCPv6 server. The range in number of the servers in a list is 1 to 8 | IPv6 address |
| IFNAME | The name of supported interface | Support physical/aggregation/vlan ports |

## Command Mode

Global Configuration

### Default

No DHCPv6 server group is defined.

### Usage

This command is used to specify the remote DHCPv6 server .

### Examples

The following example shows how to configure dhcpv6-server group globally:

```
Switch# configure terminal
Switch(config)# dhcpv6-server 1 2001:1::1
Switch(config)# dhcpv6-server 1 fe80::1 interface vlan1
```

### Related Commands

service dhcpv6

dhcpv6-server (interface)

## 5.3.3 dhcpv6-server (interface)

### Command Purpose

To add an interface into a DHCPv6 server group, use the dhcpv6-server command in interface configuration mode.

To remove this interface from the DHCPv6 server group, use the no form of this command.

### Command Syntax

dhcpv6-server *NUMBER*

no dhcpv6-server

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NUMBER | Number of the DHCPv6 server group. | 1-16 |

### Command Mode

Interface Configuration

### Default

No DHCPv6 server group is configured for the interface.

### Usage

This command is used to specify DHCPv6 server group which is configed by the command dhcpv6-server in global mode.

### Examples

The following example shows how to configure dhcpv6-server group for interface:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# dhcpv6-server 1
```

### Related Commands

service dhcpv6

## 5.3.4 dhcpv6 relay remote-id option

### Command Purpose

To enable remote-id option, use the dhcpv6 relay remote-id option command in global configuration mode.

To disable remote-id option, use the no form of this command.

### Command Syntax

dhcpv6 relay remote-id option

no dhcpv6 relay remote-id option

### Command Mode

Global Configuration

### Default

Remote-id option is not added into DHCPv6 RELAY_FORW packet sent by relay.

### Usage

None

### Examples

The following example shows how to enable remote-id option:

```
Switch# configure terminal
Switch(config)# dhcpv6 relay remote-id option
```

### Related Commands

dhcpv6 relay remote-id format

## 5.3.5 dhcpv6 relay remote-id format

### Command Purpose

To specify the format of remote-id , use the dhcpv6 relay remote-id format command in global configuration mode. To restore the default format, use the no form of this command.

### Command Syntax

dhcpv6 relay remote-id format { vlan | ifname | duid }

no dhcpv6 relay remote-id format

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| vlan | The ID of the vlan attached by client | - |

| | | |
|---|---|---|
| ifname | The name of the interface received packet from client | - |
| duid | The duid of relay | - |

## Command Mode

Global Configuration

## Default

The remote-id format is “duid:ifname:”.

## Usage

The format of remote-id can be a combination of vlan, interface name, DUID. This command specifies the existing keywords in the combination.

## Examples

The following example shows how to specify the format of remote-id:

```
Switch# configure terminal
Switch(config)# dhcpv6 relay remote-id format vlan
```

## Related Commands

dhcpv6 relay remote-id option

# 5.3.6 dhcpv6 relay pd route

## Command Purpose

To enable learning route from prefix-delegation option, use the dhcpv6 relay pd route command in global configuration.

To disable the function, use the no form of this command.

## Command Syntax

dhcpv6 relay pd route

no dhcpv6 relay pd route

### Command Mode

Global Configuration

### Default

The DHCPv6 relay won't learn prefix-delegation route.

### Usage

The DHCPv6 relay can learn route from prefix delegated by server to client. This kind of route should not replace static one. Use this command to enable this function.

### Examples

The following example shows how to enable learning route from prefix-delegation option:

```
Switch# configure terminal
Switch(config)# dhcpv6 relay pd route
```

### Related Commands

clear dhcpv6 relay pd route

dhcpv6 relay pd route distance

## 5.3.7 dhcpv6 relay pd route distance

### Command Purpose

To configure the default distance for route learned by relay, use the dhcpv6 relay pd route distance command in global configuration.

To restore the default value, use the no form of this command..

## Command Syntax

dhcpv6 relay pd route distance *DISTANCE*

no dhcpv6 relay pd route distance

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DISTANCE | The default distance for route learned by relay | 1-255 |

## Command Mode

Global Configuration

## Default

The default value of distance is 254.

## Usage

Use this command to configure the distance of the route learned by relay from prefix-delegation.

## Examples

The following example shows how to configure the distance of route added by DHCPv6 relay:

```
Switch# configure terminal
Switch(config)# dhcpv6 relay pd route distance 233
```

## Related Commands

dhcpv6 relay pd route

# 5.3.8 service dhcpv6

## Command Purpose

To enable the Dynamic Host Configuration Protocol (DHCP)V6 relay agent features on your router, use the service dhcpv6 command in global configuration mode.

To disable the DHCPv6 relay agent features, use the no form of this command.

## Command Syntax

service dhcpv6 enable

service dhcpv6 disable

## Command Mode

Global Configuration

## Default

DHCPv6 service is disabled globally.

## Usage

Only the main DHCPv6 service is enabled by the service dhcpv6 command, other DHCPv6 services could be used, such as dhcpv6 relay.

## Examples

The following example shows how to enable DHCPv6 service globally:

```
Switch# configure terminal
Switch(config)# service dhcpv6 enable
```

## Related Commands

dhcpv6 relay

# 5.3.9 debug dhcpv6 relay

## Command Purpose

Use this command to turn on the debug switches of DHCPv6 relay module.

To restore the default, use the no form of this command

## Command Syntax

debug dhcpv6 relay ( events | error | dump | packet | all )

no debug dhcpv6 relay ( events | error | dump | packet | all )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| events | Relay events | - |
| error | Error DHCP message | - |
| packet | DHCP message fields | - |
| dump | Dump message in hex format | - |
| all | Turn all debugging on | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

Use command "terminal monitor" to make debug messages print on the VTY immediately.

Use command "show logging buffer" to check the debug messages in the logging buffer.

## Examples

The following is sample to open dhcpv6 relay debug switches:

```
Switch# debug dhcpv6 relay all
```

## Related Commands

terminal monitor

show logging buffer

## 5.3.10 show dhcpv6-server

### Command Purpose

To display the DHCPv6 server groups, use the show dhcpv6-server command in privileged EXEC mode.

### Command Syntax

show dhcpv6-server

### Command Mode

Privileged EXEC

### Default

None

### Usage

This command is used to display all the DHCPv6 server groups configured with command dhcpv6-server in global mode.

### Examples

The following example shows how to display dhcpv6-server group information:

```
Switch# show dhcpv6-server
DHCPv6 server group information:
============================================================
group 1 ipv6 address list:
[1] 2001:1::1
```

### Related Commands

dhcpv6-server (global)

# 5.3.11 show dhcpv6 relay interfaces

## Command Purpose

To display to which dhcpv6-server group the interface belongs, use the show dhcpv6 relay interfaces command in privileged EXEC mode.

## Command Syntax

show dhcpv6 relay interfaces

## Command Mode

Privileged EXEC

## Default

None

## Usage

This command is used to display the interface which is confined DHCPv6 relay.

## Examples

The following example shows how to display dhcpv6 relay interfaces information:

```
Switch# show dhcpv6 relay interfaces
List of DHCPv6 relay enabled interface(s):
DHCPv6 relay service status: enabled
Interface Name          DHCPv6 server group
============================================================
eth-0-1                   1
```

## Related Commands

show dhcpv6-server

## 5.3.12 show dhcpv6 relay pd client

### Command Purpose

To display the result of DHCPv6 relay's prefix-delegation route function, use the show dhcpv6 relay pd client command in privileged EXEC mode.

### Command Syntax

show dhcpv6 relay pd client

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following example shows how to display information of prefix-delegation route:

```
Switch# show dhcpv6 relay pd client
DHCPv6 prefix-delegation client information:
============================================================
Interface  : vlan2
Client DUID  : 0001000117e9357b606da182030
Client IPv6 address  : fe80::626d:a1ff:fe82:300
    IA ID  : a18230
        IA Prefix :  2002:2:10::/64
            prefered/max lifetime : 280/300
            expired time :  2012-09-17 11:43:59
============================================================
```

### Related Commands

dhcpv6 relay pd route

dhcpv6 relay pd route distance

## 5.3.13 show dhcpv6 relay statistics

### Command Purpose

To display the statistics of DHCPv6 packets relayed by the switch, use the show dhcpv6 relay statistics command in privileged EXEC mode.

### Command Syntax

show dhcpv6 relay statistics

### Command Mode

Privileged EXEC

### Default

None

### Usage

This command is used to display detail DHCPv6 statistics which processed by the switch.

### Examples

The following example shows how to display DHCPv6 relay statistics:

```
Switch# show dhcpv6 relay statistics
DHCPv6 relay packet statistics:
============================================================
Client relayed packets:  48
Server relayed packets:  48
Client error packets:    0
Server error packets:    0
```

### Related Commands

clear dhcpv6 relay statistics

## 5.3.14 clear dhcpv6 relay statistics

### Command Purpose

To reset the statistics of DHCPv6 packets relayed by the switch, use the clear dhcpv6 relay statistics command in privileged EXEC mode.

### Command Syntax

clear dhcpv6 relay statistics

### Command Mode

Privileged EXEC

### Default

None

### Usage

This command is used to reset DHCPv6 statistics.

### Examples

The following example shows how to clear DHCPv6 relay statistics:

```
Switch# clear dhcpv6 relay statistics
```

### Related Commands

show dhcpv6 relay statistics

## 5.3.15 clear dhcpv6 relay pd route

### Command Purpose

To clear the route learned by DHCPv6 relay from prefix-delegation, use the clear dhcpv6 relay pd route command in privileged EXEC mode.

## Command Syntax

clear dhcpv6 relay pd route ( prefix *PREFIX* | ) ( interface *IFNAME* | ) ( *IPV6_ADDR* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PREFIX | The prefix delegated to client | IPv6 Address and mask length in X:X::X:X/M format |
| IPV6_ADDR | The IPv6 address of PD client | IPv6 Address |
| IFNAME | The name of supported interface | Support physical/aggregation/vlan ports |

## Command Mode

Privileged EXEC

## Default

None

## Usage

If no parameter is specified, all route will be cleared.

## Examples

The following example shows how to clear route learned by DHCPv6 relay:

```
Switch# clear dhcpv6 relay pd route interface eth-0-1
```

## Related Commands

dhcpv6 relay pd route

show dhcpv6 relay pd client

# 5.4 DHCPv6 Server Commands

## 5.4.1 dhcpv6 server

### Command Purpose

Use the 'dhcpv6 server' command to globally enable DHCPv6 Server.

Use the 'no' form of this command to delete the configuration and disable DHCPv6 Server.

### Command Syntax

dhcpv6 server

no dhcpv6 server

### Command Mode

Global Configuration

### Default

None

### Usage

Use this command to enable the global DHCPv6 Server. Use the 'no' form of this command to disable this feature.

### Examples

Enable global DHCPv6 Server.

```
Switch(config)# dhcpv6 server
```

### Related Commands

service dhcpv6 enable

service dhcpv6 disable

## 5.4.2 dhcpv6 pool

### Command Purpose

Create and enter address pool configuration mode using the 'dhcpv6 pool' command.

Use the 'no' form of this command to delete the address pool.

### Command Syntax

dhcpv6 pool WORD

no dhcpv6 pool WORD

### Command Mode

Global Configuration

### Default

None

### Usage

Use this command to create and enter IPv6 address pool configuration mode. If the address pool already exists, enter address pool configuration mode. Use the 'no' form of this command to disable this feature.

### Examples

Enable global DHCPv6 Server.

```
Switch(config)# dhcpv6 pool v6pool1
Switch(config-dhcpv6)#
```

### Related Commands

dhcpv6 server WORD

## 5.4.3 dhcpv6 duid

### Command Purpose

Use the 'dhcpv6 duid' command to configure the DUID of the switch.

### Command Syntax

dhcpv6 duid (en WORD WORD | ll | llt)

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| en | Hardware type (2)+time (4)+link layer address | - |
| ll | Hardware type (2)+link layer address | - |
| llt | Enterprise ID (4) + Manufacturer Custom Identifier | - |

### Command Mode

Global Configuration

### Default

The switch defaults to LL mode to automatically generate duid, which is "00030001"+device MAC address.

### Usage

Use this command to modify the DUID generation mode of the switch. The default mode is LL mode.

### Examples

Enable global DHCPv6 Server.

```
Switch(config)# dhcpv6 duid llt
Switch(config)#
```

## Related Commands

None

# 5.4.4 network

## Command Purpose

Use the 'network' command to configure the IPv6 prefix for the IPv6 address pool. Use the 'no' form of this command to delete the specified IPv6 prefix.

## Command Syntax

network X:X::X:X/M

no network

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| X:X::X:X | IPv6 address | - |
| M | IPv6 prefix length | <16-127> |

## Command Mode

DHCPv6 pool Configuration

## Default

None

## Usage

Use this command to configure an address prefix for an IPv6 address pool.

## Examples

Configure an IPv6 network with a prefix length of 64 bits.

```
Switch(config-dhcpv6)# network 2003:1:1::1/64
Switch(config-dhcpv6)#
```

## Related Commands

None

# 5.4.5 prefix-delegation

## Command Purpose

When a DHCPv6 server needs to automatically allocate network parameters in a DHCPv6 stateful , use the 'prefix delegation' command to configure the IPv6 network prefix for the IPv6 address pool. Use the 'no' form of this command to delete the specified IPv6 network prefix.

## Command Syntax

prefix-degation X:X::X:X/M <16-128>

no prefix-degation

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| X:X::X:X/M | IPv6 prefix | - |
| <16-128> | IPv6 prefix length | <16-128> |

## Command Mode

DHCPv6 pool Configuration

## Default

None

## Usage

Use this command to configure an authorization prefix for the IPv6 address pool.

## Examples

Configure an IPv6 network authorization prefix with a prefix length of 120 bits.

```
Switch(config-dhcpv6)# prefix-degation 2003:1:1::1/64 120
Switch(config-dhcpv6)#
```

## Related Commands

None

# 5.4.6 exclude-address

## Command Purpose

Use the 'exclude address' command to configure the range of IPv6 addresses in the IPv6 address pool that do not participate in automatic allocation. Use the 'no' form of this command to delete the configuration and put the address into the dynamically allocated address pool.

## Command Syntax

exclude-address X:X::X:X (X:X::X:X|)

no exclude-address X:X::X:X (X:X::X:X|)

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| X:X::X:X | IPv6 address | - |

## Command Mode

DHCPv6 pool Configuration

## Default

None

## Usage

Use this command to specify that IPv6 addresses or address segments are excluded from the dynamically allocated address pool and do not participate in dynamic allocation.

## Examples

Configure IPv6 addresses 2003:1:1: 1-6 not to participate in dynamic allocation and to be reserved as fixed addresses for servers in the network.

```
Switch(config-dhcpv6)# exclude-address 2003:1:1::1 2003:1:1::6
Switch(config-dhcpv6)#
```

### Related Commands

None

## 5.4.7 static-bind address

### Command Purpose

Use the 'static-bind address' command to configure a static binding entry. The server will assign fixed IPv6 addresses to clients whose attributes match. Use the 'no' form of this command to delete the configuration.

### Command Syntax

static-bind address X:X::X:X {mac-address HHHH.HHHH.HHHH | duid WORD | interface-id (ascii WORD | hex HHHH) | remote-id (ascii WORD | hex HHHH)}

no static-bind address X:X::X:X

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| HHHH.HHHH.HHHH | The MAC address of the client | - |
| WORD | DUID, interface-id, or remote-id in string format | |
| HHHH | Interface-id or remote-id in hexadecimal | |

### Command Mode

DHCPv6 pool Configuration

### Default

None

## Usage

Use this command to configure an IPv6 address binding entry, and the server will assign the specified IPv6 address to requests that match the attribute values in the entry.

## Examples

Assign IPv6 address: 2003:1:1::35 to the client with MAC address ec0c.0101.0101.

```
Switch(config-dhcpv6)# static-bind address 2003:1:1::35 mac-address ec0c.0101.0101
Switch(config-dhcpv6)#
```

## Related Commands

None

# 5.4.8 static-bind prefix

## Command Purpose

Use the 'static-bind prefix' command to configure a static binding entry. The server will assign a fixed IPv6 network prefix to clients whose attributes match. Use the 'no' form of this command to delete the configuration.

## Command Syntax

static-bind prefix X:X::X:X/M {mac-address HHHH.HHHH.HHHH | duid WORD | interface-id (ascii WORD | hex HHHH) | remote-id (ascii WORD | hex HHHH)}

no static-bind prefix X:X::X:X/M

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| HHHH.HHHH.HHHH | The MAC address of the client | - |
| WORD | DUID, interface-id, or remote-id in string format | - |
| HHHH | Interface-id or remote-id in hexadecimal | - |

## Command Mode

DHCPv6 pool Configuration

## Default

None

## Usage

When a DHCPv6 server needs to automatically allocate network parameters in a DHCPv6 stateful manner, use this command to configure an IPv6 address binding entry, and the server will assign the specified IPv6 network prefix to requests that match the attribute values in the entry.

## Examples

Assign IPv6 network prefix 2003:1:1::/120 to clients with MAC address ec0c.0101.0101.

```
Switch(config-dhcpv6)# static-bind prefix 2003:1:1::/120 mac-address ec0c.0101.0101
Switch(config-dhcpv6)#
```

## Related Commands

None

# 5.4.9 dns-server

## Command Purpose

Use the 'dns-server' command to configure DNS server addresses for the DHCPv6 address pool. Use the 'no' form of this command to delete the configuration.

## Command Syntax

dns-server X:X::X:X (X:X::X:X|)

no dns-server

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| X:X::X:X | IPv6 address of dns-server | - |

## Command Mode

DHCPv6 pool Configuration

## Default

None

## Usage

Execute the command 'dns server' to configure DNS server addresses for the DHCPv6 address pool.

## Examples

Configure DNS server address 2003:2:1::1 for the address pool.

```
Switch(config-dhcpv6)# dns-server 2003:2:1::1
Switch(config-dhcpv6)#
```

## Related Commands

None

# 5.4.10 dns-domain-name

## Command Purpose

Use the 'dns-domain-name' command to configure the DNS domain suffix assigned by the DHCPv6 server to DHCPv6 clients. Use the 'no' form of this command to delete the configuration.

## Command Syntax

dns-domain-name WORD

no dns-domain-name

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| WORD | DNS domain suffix | - |

## Command Mode

DHCPv6 pool Configuration

## Default

None

## Usage

Execute the command 'dns-domain-name' to configure the DHCPv6 address pool as the DNS domain suffix assigned by the DHCPv6 client.

## Examples

Configure the DNS domain suffix 'company. com' for the address pool.

```
Switch(config-dhcpv6)# dns-domain-name company.com
Switch(config-dhcpv6)#
```

## Related Commands

None

# 5.4.11 nis-server

## Command Purpose

Use the 'nis-server' command to configure NIS server addresses for the DHCPv6 address pool. Use the 'no' form of this command to delete the configuration.

## Command Syntax

nis-server X:X::X:X (X:X::X:X|)

no nis-server

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| X:X::X:X | The IPv6 address of nis-server | - |

## Command Mode

DHCPv6 pool Configuration

## Default

None

## Usage

Execute the command nis-server to configure the DHCPv6 address pool with the IPv6 addresses assigned to nis-server by DHCPv6 clients.

## Examples

Configure nis-server address for address pool: 2003:2:1:: 1.

```
Switch(config-dhcpv6)# nis-server 2003:2:1::1
Switch(config-dhcpv6)#
```

## Related Commands

None

# 5.4.12 nis-domain-name

## Command Purpose

Use the 'nis-domain-name' command to configure the NIS domain suffix assigned by the DHCPv6 server to DHCPv6 clients. Use the 'no' form of this command to delete the configuration.

## Command Syntax

nis-domain-name WORD

no nis-domain-name

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| WORD | NIS domain suffix | - |

## Command Mode

DHCPv6 pool Configuration

## Default

None

## Usage

Use the 'nis-domain-name' command to configure the NIS domain suffix assigned by the DHCPv6 server to DHCPv6 clients.

## Examples

Configure the nis-domain name suffix for the address pool to be company. com.

```
Switch(config-dhcpv6)# nis-domain-name company.com
Switch(config-dhcpv6)#
```

## Related Commands

None

# 5.4.13 nisp-server

## Command Purpose

Use the 'nisp-server' command to configure NISP server addresses for the DHCPv6 address pool. Use the 'no' form of this command to delete the configuration.

## Command Syntax

nisp-server X:X::X:X (X:X::X:X|)

no nisp-server

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| X:X::X:X | The ipv6 address of nisp-server | - |

## Command Mode

DHCPv6 pool Configuration

## Default

None

## Usage

Execute the command nisp-server to configure the DHCPv6 address pool with the IPv6 address of nisp-server assigned to DHCPv6 clients.

## Examples

Configure nisp-server address for address pool: 2003:2:1:: 1.

```
Switch(config-dhcpv6)# nisp-server 2003:2:1::1
Switch(config-dhcpv6)#
```

## Related Commands

None

# 5.4.14 nisp-domain-name

## Command Purpose

Use the 'nisp-domain-name' command to configure the NISP domain suffix assigned by the DHCPv6 server to DHCPv6 clients. Use the 'no' form of this command to delete the configuration.

## Command Syntax

nisp-domain-name WORD

no nisp-domain-name

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| WORD | NISP domain suffix | - |

## Command Mode

DHCPv6 pool Configuration

## Default

None

## Usage

Use the 'nisp-domain-name' command to configure the NISP domain suffix assigned by the DHCPv6 server to DHCPv6 clients.

## Examples

Configure the nisp-domain-name suffix for the address pool to be “company. com”.

```
Switch(config-dhcpv6)# nisp-domain-name company.com
Switch(config-dhcpv6)#
```

## Related Commands

None

# 5.4.15 sip-server

## Command Purpose

Use the 'sip-server' command to configure SIP server addresses for the DHCPv6 address pool. Use the 'no' form of this command to delete the configuration.

## Command Syntax

sip-server X:X::X:X (X:X::X:X|)

no sip-server

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| X:X::X:X | IPv6 address of sip-server | - |

## Command Mode

DHCPv6 pool Configuration

## Default

None

## Usage

Execute the command 'sip-server' to configure the DHCPv6 address pool with the IPv6 address of the sip-server assigned to DHCPv6 clients.

## Examples

Configure the SIP-server address for the address pool: 2003:2:1:: 1.

```
Switch(config-dhcpv6)# sip-server 2003:2:1::1
Switch(config-dhcpv6)#
```

## Related Commands

None

# 5.4.16 sip-domain-name

## Command Purpose

Use the 'sip-domain-name' command to configure the SIP domain suffix assigned by the DHCPv6 server to DHCPv6 clients. Use the 'no' form of this command to delete the configuration.

## Command Syntax

nisp-domain-name WORD

no sip-domain-name

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| WORD | SIP domain suffix | - |

## Command Mode

DHCPv6 pool Configuration

## Default

None

## Usage

Use the 'sip-domain-name' command to configure the SIP domain suffix assigned by the DHCPv6 server to DHCPv6 clients.

## Examples

Configure the SIP domain name suffix for the address pool to be “company. com”.

```
Switch(config-dhcpv6)# sip-domain-name company.com
Switch(config-dhcpv6)#
```

## Related Commands

None

# 5.4.17 sntp-server

## Command Purpose

Use the 'sntp-server' command to configure SNTP server addresses for the DHCPv6 address pool. Use the 'no' form of this command to delete the configuration.

## Command Syntax

Sntp-server X:X::X:X (X:X::X:X|)

no sntp-server

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| X:X::X:X | IPv6 address of Sntp-server | - |

## Command Mode

DHCPv6 pool Configuration

## Default

None

## Usage

Execute the command sntp-server to configure the DHCPv6 address pool with the IPv6 address of sntp server assigned to DHCPv6 clients.

## Examples

Configure the SNTP server address for the address pool: 2003:2:1:: 1.

```
Switch(config-dhcpv6)# sntp-server 2003:2:1::1
Switch(config-dhcpv6)#
```

## Related Commands

None

# 5.4.18 information-refresh

## Command Purpose

Use the 'information refresh' command to configure the update time of information issued by the server to the client. Use the 'no' form of this command to delete the configuration and restore it to its default value.

## Command Syntax

information-refresh <600-4294967295>

no information-refresh

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NUM | Information update time | <600-4294967295> |

## Command Mode

DHCPv6 pool Configuration

## Default

86400(s)。

## Usage

Use the 'information-refresh' command to configure the information update time issued by the server to the client. In stateless mode, the client does not have the concept of "lease term", but configuration information (such as DNS settings) may change over time. This parameter specifies when the server should proactively contact the DHCPV6 server to refresh stateless configuration information.

## Examples

Configure the 'information-refresh' time for the address pool to be 12 hours.

```
Switch(config-dhcpv6)# information-refresh 43200
Switch(config-dhcpv6)#
```

## Related Commands

None

# 5.4.19 life-time

## Command Purpose

Use the 'life-time' command to configure the preferred and effective lifetime of IPv6 addresses assigned by the client. Use the 'no' form of this command to delete the configuration and restore it to its default value.

## Command Syntax

life-time (<600-8640000>|infinite) (<600-8640000>|infinite)

no life-time

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NUM | Valid lifetime and Preferred lifetime, in seconds | <60-8640000> |

## Command Mode

DHCPv6 pool Configuration

## Default

Valid lifetime：172800 秒

Preferred lifetime：86400 秒

## Usage

Use the 'life-time' command to configure the preferred and Valid life-time of IPv6 addresses issued by the server to clients. Within the preferred lifetime, the client can use this address for any communication without any barriers. The valid time includes the preferred time, which is usually twice the preferred time. After the preferred survival time ends and the client can still use the address within the valid time, ongoing communication will not be interrupted. If the client completes the renewal within the valid time, it will return to the preferred state.

## Examples

Configure the valid lifetime time for the address pool to be 24 hours and the preferred lifetime time to be 12 hours.

```
Switch(config-dhcpv6)# life-time 86400 43200
Switch(config-dhcpv6)#
```

## Related Commands

None

# 5.4.20 option

## Command Purpose

Use the "option" command to configure DHCPv6 custom options. Use the "no" form of this command to delete the configuration and restore it to the default value.

## Command Syntax

option <5-254> (ascii WORD | hex HHHH | ip X:X::X:X)

no option <5-254>

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| WORD | DUID, interface-id, or remote-id in string format | - |
| HHHH | Interface-id or remote-id in hexadecimal | - |
| X:X::X:X | IPv6 address | - |

## Command Mode

DHCPv6 pool Configuration

## Default

None

## Usage

Configure DHCPv6 options, which can be obtained by clients during their requests.

## Examples

Configure a custom option 100, and send a server address: 2001:db8:feed::1234 to the client in hexadecimal format.

```
Switch(config-dhcpv6)# option 100 hex 20010DB8FEED0000000000000001234
Switch(config-dhcpv6)#
```

## Related Commands

None

# 5.4.21 dhcpv6 server enable

## Command Purpose

Use this command to enable or disable the dhcpv6 server functionality of the interface.

## Command Syntax

dhcpv6 server (enable | disable)

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| WORD | IPv6 pool | - |

## Command Mode

Interface Configuration

## Default

disable

## Usage

Enable or disable the dhcpv6 server function on the interface, and enable or disable the ability to allocate dhcpv6 addresses.

## Examples

Enable the DHCPv6 Server feature of vlan1.

```
Switch(config)# interface vlan1
Switch(config-if)# dhcpv6 server enable
```

## Related Commands

None

## 5.4.22 dhcpv6 server

### Command Purpose

Bind DHCPv6 address pool on the interface for address allocation. Use the 'no' form of this command to unbind.

### Command Syntax

dhcpv6 server WORD

no dhcpv6 server

### Command Mode

Interface Configuration

### Default

None

### Usage

Execute this command in interface configuration mode, using the name of the address pool as an index, to bind the configured dhcpv6 pool to the interface for address allocation of dhcpv6 clients.

### Examples

Bind the address pool dhcpv6-pool1 to vlan1.

```
Switch(config)# interface vlan1
Switch(config-if)# dhcpv6 server dhcpv6-pool1
```

### Related Commands

None

# 5.4.23 show dhcpv6 server pool

## Command Purpose

Use the "show dhcpv6 server pool " command to display the configuration information of the address pool.

## Command Syntax

show dhcpv6 server pool (WORD|)

## Command Mode

Privileged EXEC

## Default

None

## Usage

Display configuration information for the specified address pool.

## Examples

Display configuration information for address pool dhcpv6-pool1

```
Switch# show dhcpv6 server pool
 Pool : dhcpv6-pool1
   NA-Network                : 2003:1:1::/64
     Number of Active Leases  : 2
     Number of Conflict Leases: 0
   Lifetime valid             : 172800 seconds
   Lifetime preferred         : 86400 seconds
   Information refresh time   : 86400 seconds

Switch#
```

## Related Commands

None

## 5.4.24 show dhcpv6 server pool allocated

### Command Purpose

Use this command to display the allocated addresses or prefixes of the address pool, excluding statically bound addresses.

### Command Syntax

show dhcpv6 server pool WORD allocated (address|prefix)

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| WORD | Name of pool | - |
| address | Ipv6 address | |
| prefix | Address prefix | |

### Command Mode

Privileged EXEC

### Default

None

### Usage

Display the address or prefix allocation status of the specified address pool.

### Examples

Display address allocation information for address pool dhcpv6-pool1

```
Switch# show dhcpv6 server pool dhcpv6-pool1 allocated address

Address                                         State      Valid      Expires
Left
-------------------------------------------------------------------------------
--------------------
```

```
2003:1:1:0:5df6:b600:2e4a:d481                    active     172800     2025/10/14
22:27:20  160700
2003:1:1:0:31a4:f422:9078:d626                    active     172800     2025/10/15
01:46:46  172666
------------------------------------------------------------------------------
--------------------
Total: 2
Switch#
```

## Related Commands

None

# 5.4.25 show dhcpv6 server pool conflict

## Command Purpose

Use this command to display address conflict information for the address pool.

## Command Syntax

show dhcpv6 server pool WORD conflict (address|prefix)

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| WORD | Name of address pool | - |
| address | IPv6 address | |
| prefix | IPv6 prefix | |

## Command Mode

Privileged EXEC

## Default

None

## Usage

Display conflict information of addresses or prefixes in the specified address pool during the allocation process.

### Examples

Display conflict information for address allocation of address pool dhcpv6-pool1

### Related Commands

None

## 5.4.26 show dhcpv6 server statistics

### Command Purpose

Use this command to display packet statistics related to DHCPv6 Server.

### Command Syntax

show dhcpv6 server statistics

### Command Mode

Privileged EXEC

### Default

None

### Usage

Display packet statistics related to DHCPv6 Server.

### Examples

Display packet statistics related to DHCPv6 Server.

```
Switch# show dhcpv6 server statistics
Input: total 33 packets, discarded 0 packets
  Solicit                 :         16,  Advertise              :          0
  Request                 :         16,  Confirm                :          0
  Renew                   :          0,  Rebind                 :          0
  Reply                   :          0,  Release                :          1
  Decline                 :          0,  Reconfigure            :          0
  Information-request     :          0,  Relay-forward          :          0
```

```
 Relay-reply             :          0,  Leasequery             :          0
 Leasequery-reply        :          0,

Output: total 33 packets, discarded 0 packets
Switch#
```

## Related Commands

None

# 5.4.27 show dhcpv6 server interface

## Command Purpose

Use this command to display interfaces that have enabled DHCPv6 Server functionality.

## Command Syntax

show dhcpv6 server interfaces

## Command Mode

Privileged EXEC

## Default

None

## Usage

Display interfaces that have enabled DHCPv6 Server functionality.

## Examples

Display interfaces that have enabled DHCPv6 Server functionality

```
Switch# show dhcpv6 server interfaces
List of DHCPv6 server enabled interface(s):
DHCPv6 server service status: enabled
Interface Name
============================================================
vlan15
```

```
Switch#
```

### Related Commands

None

## 5.4.28 show dhcpv6 duid

### Command Purpose

Use this command to display the DUID of the switch.

### Command Syntax

show dhcpv6 duid

### Command Mode

Privileged EXEC

### Default

None

### Usage

display the DUID of the switch.

### Examples

display the DUID of the switch.

```
Switch# show dhcpv6 duid
The device's DHCPv6 unique identifier: 00030001000102030406
Switch#
```

### Related Commands

None

## 5.4.29 clear dhcpv6 server statistics

### Command Purpose

Use this command to clear packet statistics related to DHCPv6 Server.

### Command Syntax

clear dhcpv6 server statistics

### Command Mode

Privileged EXEC

### Default

None

### Usage

Clear packet statistics related to DHCPv6 Server.

### Examples

Clear packet statistics related to DHCPv6 Server

```
Switch# clear dhcpv6 server statistics
Switch# show dhcpv6 server statistics
Input: total 0 packets, discarded 0 packets
  Solicit                 :          0,  Advertise              :          0
  Request                 :          0,  Confirm                :          0
  Renew                   :          0,  Rebind                 :          0
  Reply                   :          0,  Release                :          0
  Decline                 :          0,  Reconfigure            :          0
  Information-request     :          0,  Relay-forward          :          0
  Relay-reply             :          0,  Leasequery             :          0
  Leasequery-reply        :          0,

Output: total 0 packets, discarded 0 packets
Switch#
```

## Related Commands

None

# 5.4.30 clear dhcpv6 server pool allocated

## Command Purpose

Use this command to clear the allocation information of the address pool.

## Command Syntax

clear dhcpv6 server pool WORD allocated (address (X:X::X:X|all) | prefix (X:X::X:X/M|all))

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| WORD | Name of pool | - |
| X:X::X:X | IPv6 address | - |
| prefix | IPv6 prefix | - |
| all | all of address and prefix | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

When duplicate allocation of IPv6 addresses leads to client address conflicts or when network planning requires reassignment of IPv6 addresses to clients, the IPv6 address pool can be reset to make the IPv6 addresses in the pool return to an idle state, so that clients can reapply for these IPv6 addresses.

## Examples

Clear the address allocation information of address pool dhcpv6-pool1

```
Switch# show dhcpv6 server pool test all address

Address                                          State      Valid      Expires
Left
-------------------------------------------------------------------------------
--------------------
2003:1:1:0:ed24:b448:6ed0:4164                   active     172800     2025/10/23
12:48:27  172493
2003:1:1:0:11ca:b318:b02:34be                    active     172800     2025/10/23
12:48:27  172493
2003:1:1:0:a8b6:4ff8:d608:8207                   active     172800     2025/10/23
12:48:27  172493
2003:1:1:0:38b0:2357:df53:1874                   active     172800     2025/10/23
12:48:27  172493
2003:1:1:0:4410:3377:2b53:39ae                   active     172800     2025/10/23
12:48:27  172493
-------------------------------------------------------------------------------
--------------------
Total: 5
Switch# clear dhcpv6 server pool test allocated address all
Switch# show dhcpv6 server pool test all address

Address                                          State      Valid      Expires
Left
-------------------------------------------------------------------------------
--------------------
-------------------------------------------------------------------------------
--------------------
Total: 0
Switch#
```

## Related Commands

None

# 5.4.31 clear dhcpv6 server pool conflict

## Command Purpose

Use this command to clear address conflict information of the address pool.

## Command Syntax

clear dhcpv6 server pool WORD conflict (address (X:X::X:X|all) | prefix (X:X::X:X/M|all))

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| WORD | Name of address pool | - |
| X:X::X:X | IPv6 address | - |
| prefix | IPv6 prefix | - |
| all | All of the address and prefix | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

Clear the conflict information of addresses or prefixes in the specified address pool during the allocation process.

## Examples

Clear the address conflict information of address pool dhcpv6-pool1

```
Switch# clear dhcpv6 server pool dhcpv6-pool1 conflict address all
Switch# show dhcpv6 server pool dhcpv6-pool1 conflict  address

Address                                          State      Valid      Expires
Left
-------------------------------------------------------------------------------
--------------------
-------------------------------------------------------------------------------
--------------------
Total: 0
Switch#
```

## Related Commands

None

# 6 IP Routing Commands

## 6.1 IP Unicast-Routing Commands

### 6.1.1 ip address

#### Command Purpose

To set a primary or secondary IP address for an interface, use the ip address command in interface configuration mode. To remove an IP address or disable IP processing, use the no form of this command.

#### Command Syntax

ip address ( *ADDRESS WILDCARD-MASK* | *ADDRESS /PREFIX-LENGTH* ) ( secondary | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ADDRESS | IPv4 address of the interface | IPv4 address |
| WILDCARD-MASK | Mask for the associated IP subnet | Mask in IPv4 address format |
| PREFIX-LENGTH | Prefix length of the address | 1-32 |
| secondary | (Optional) Specifies that the configured address is a secondary IP address. If this keyword is omitted, the configured address is the primary IP address | - |

#### Command Mode

Interface Configuration

#### Default

No IP address is defined for the interface.

## Usage

An interface can have one primary IP address and multiple secondary IP addresses. Packets generated by the switch always use the primary IP address. Therefore, all switches and access servers on a segment should share the same primary network number.

Hosts can determine subnet masks using the Internet Control Message Protocol (ICMP) mask request message. Switch respond to this request with an ICMP mask reply message.

You can disable IP processing on a particular interface by removing its IP address with the no ip address command. If the software detects another host using one of its IP addresses, it will print an error message on the console.

The optional secondary keyword allows you to specify up to 8 secondary addresses. Secondary addresses are treated like primary addresses, except the system never generates datagrams other than routing updates with secondary source addresses. IP broadcasts and Address Resolution Protocol (ARP) requests are handled properly, as are interface routes in the IP routing table.

Secondary IP addresses can be used in a variety of situations. The following are the most common applications:

There may not be enough host addresses for a particular network segment. For example, your subnet allows up to 254 hosts per logical subnet, but on one physical subnet you need 300 host addresses. Using secondary IP addresses on the switches or access servers allows you to have two logical subnets using one physical subnet.

Many older networks were built using Level 2 bridges. The judicious use of secondary addresses can aid in the transition to a subnet and router-based network. Switches on an older, bridged segment can be easily made aware that many subnets are on that segment.

Two subnets of a single network might otherwise be separated by another network. This situation is not permitted when subnets are in use. In these instances, the first network is extended, or layered on top of the second network using secondary addresses.

### Examples

In the following example, 10.108.1.27 is the primary address and 192.31.7.17 and 192.31.8.17 are secondary addresses for eth-0-1:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ip address 10.108.1.27 255.255.255.0
Switch(config-if)# ip address 192.31.7.17/24 secondary
Switch(config-if)# ip address 192.31.8.17 255.255.255.0 secondary
```

### Related Commands

None

## 6.1.2 ip unnumbered

### Command Purpose

To borrow a primary IP address for an interface, use the ip unnumbered command in interface configuration mode. To remove an IP address, use the no form of this command.

### Command Syntax

ip unnumbered *IFNAME*

no ip unnumbered

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFAME | The borrowed interface | - |

### Command Mode

Interface Configuration

### Default

No IP unnumbered is defined for the interface.

## Usage

None

## Examples

In the following example, eth-0-1 borrowed the ip address of eth-0-2:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ip unnumbered eth-0-2
```

## Related Commands

None

# 6.1.3 ip icmp error-interval

## Command Purpose

To set the interval of ICMP error messages generated by the switch, use the ip icmp error-interval command in global configuration mode. To restore the default value, use the no form of this command.

## Command Syntax

ip icmp error-interval *INTERVAL*

no ip icmp error-interval

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INTERVAL | The interval in milliseconds. | 0 - 2147483647 milliseconds |

## Command Mode

Global Configuration

## Default

Default is 1000 milliseconds.

## Usage

None

## Examples

In the following example, user sets the error interval to 10 seconds, which means only one ICMP error message was generated per 10 seconds:

```
Switch# configure terminal
Switch(config)# ip icmp error-interval 10000
```

## Related Commands

ip redirects

ip unreachables

# 6.1.4 ip redirects

## Command Purpose

To enable send the ICMP redirect messages generated by the switch, use the ip redirects command in interface configuration mode. To restore the default value, use the no form of this command.

## Command Syntax

ip redirects

no ip redirects

## Command Mode

Interface Configuration

## Default

IP redirect is enabled by default.

### Usage

None

### Examples

In the following example, users disable to send the ICMP redirect message:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport
Switch(config-if)# ip address 10.10.10.1/24
Switch(config-if)# no ip redirects
```

### Related Commands

ip unreachables

ip icmp error-interval

## 6.1.5 ip unreachables

### Command Purpose

To enable send the ICMP unreachable messages generated by the switch, use the ip unreachables command in interface configuration mode. To restore the default value, use the no form of this command.

### Command Syntax

ip unreachables

no ip unreachables

### Command Mode

Interface Configuration

### Default

IP unreachable is enabled by default.

### Usage

None

### Examples

In the following example, users disable to send the ICMP unreachable message:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport
Switch(config-if)# ip address 10.10.10.1/24
Switch(config-if)# no ip unreachables
```

### Related Commands

ip redirects

ip icmp error-interval

## 6.1.6 ip verify unicast reverse-path

### Command Purpose

To enable URPF check to the interface, use the command ip verify unicast reverse-path in interface configuration mode. To restore the default value, use the no form of this command.

### Command Syntax

ip verify unicast reverse-path

no ip verify unicast reverse-path

### Command Mode

Interface Configuration

### Default

URPF check is disabled by default.

### Usage

None

### Examples

In the following example, users enable URPF check in interface eth-0-1:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport
Switch(config-if)# ip address 10.10.10.1/24
Switch(config-if)# ip verify unicast reverse-path
```

### Related Commands

ip redirects

ip icmp error-interval

## 6.1.7 unicast reverse-path check-type (strict | loose )

### Command Purpose

Use this command to configure URPF check type to the interface in interface configuration mode.To restore the default value, use the no form of this command.

### Command Syntax

unicast reverse-path check-type ( strict | loose )

no unicast reverse-path check-type

### Command Mode

Interface Configuration

### Default

URPF check-type is strict by default.

## Usage

URPF check-type takes effort for both ipv4 and ipv6.

## Examples

In the following example, users configure URPF check-type loose in interface eth-0-1:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport
Switch(config)# unicast reverse-path check-type loose
```

## Related Commands

None

# 6.1.8 router-id (global)

## Command Purpose

To use a fixed router ID for all routing protocols, use the router-id command in global configuration mode. To let switch select the router ID automatically, use the no form of this command.

## Command Syntax

router-id *IP-ADDRESS*

no router-id

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IP-ADDRESS | Router ID in IP address format | IPv4 address |

## Command Mode

Global Configuration

## Default

No router ID is defined.

## Usage

You can configure an arbitrary value in the IP address format for each switch. However, each router ID must be unique.

## Examples

The following example specifies a fixed router-id:

```
Switch# configure terminal
Switch(config)# router-id 1.1.1.1
```

## Related Commands

router-id (router)

# 6.1.9 ip route

## Command Purpose

To establish static routes, use the ip route command in global configuration mode. To remove static routes, use the no form of this command.

## Command Syntax

ip route vrf *VRF-NAME* ( *PREFIX MASK* | *PREFIX/PREFIX-LENGTH* ) ( *NH-ADDRESS* public | ( vrf *VRF-NAME* | ) *NH-ADDRESS* | *IFNAME* ( *NH-ADDRESS* | ) | *IFNULL* ) ( *DISTANCE* | ) ( bind bfd *BFD-NAME* | track *NUMBER* | )

no ip route vrf *VRF-NAME* ( *PREFIX MASK* | *PREFIX/PREFIX-LENGTH* ) ( *NH-ADDRESS* public | ( vrf *VRF-NAME* | ) *NH-ADDRESS* | *IFNAME* ( *NH-ADDRESS* | ) | *IFNULL* | ) ( bind bfd | track | )

ip route ( *PREFIX MASK* | *PREFIX/PREFIX-LENGTH* ) ( ( vrf *VRF-NAME* | ) *NH-ADDRESS* | *IFNAME* ( *NH-ADDRESS* | ) | *IFTUNNEL* | *IFNULL* ) ( *DISTANCE* | ) ( bind ( bfd | sbfd ) *BFD-NAME* | track *NUMBER* | )

no ip route ( *PREFIX MASK* | *PREFIX/PREFIX-LENGTH* ) ( ( vrf *VRF-NAME* | ) *NH-ADDRESS* | *IFNAME* ( *NH-ADDRESS* | ) | *IFTUNNEL* | *IFNULL* | ) ( bind ( bfd | sbfd ) | track | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VRF-NAME | VRF instance name | A string up to 31 characters |
| PREFIX | IP route prefix for the destination | IPv4 address |
| MASK | Prefix mask for the destination | Mask in IPv4 address format |
| PREFIX-LENGTH | Prefix length for the destination | 1-32 |
| IFNAME | Interface name of the next hop that can be used to reach that network | - |
| IFTUNNEL | tunnel port | - |
| IFNULL | NULL 0 port | - |
| NH-ADDRESS | IP address of the next hop that can be used to reach that network | IPv4 address |
| DISTANCE | (Optional) An administrative distance. The default administrative distance for a static route is 1 | 1-255 |
| track NUMBER | Specify the ID of track object | 1-500 |
| BFD-NAME | Specify the name of bfd | A string up to 16 characters |

## Command Mode

Global Configuration

## Default

No static routes are established.

## Usage

The establishment of a static route is appropriate when the switch cannot dynamically build a route to the destination.

## Examples

The following example establishes a static route:

```
Switch# configure terminal
Switch(config)# ip route 172.31.0.0 255.255.0.0 172.31.6.6
```

## Related Commands

show ip route

# 6.1.10 show ip route

## Command Purpose

To display the current state of the routing table, use the show ip route command in user EXEC or privileged EXEC mode.

## Command Syntax

show ip route ( *VRF NAME* | ) ( *IP-ADDRESS* | *PREFIX/PREFIX-LENGTH* | *PROTOCOL* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VRF NAME | VRF instance name | A string up to 31 characters |
| IP-ADDRESS | (Optional) Address about which routing information should be displayed | IPv4 address |
| PREFIX | IP route prefix | IPv4 address |
| PREFIX-LENGTH | Prefix length for the route | 1-32 |
| PROTOCOL | (Optional) The name of a routing protocol, or the keyword connected, static, or summary. If you specify a routing protocol, use one of the following keywords: bgp, ospf, and rip. | bgp/connected/isis/ospf/rip/static |

## Command Mode

Privileged EXEC

## Default

None

## Usage

You can display all active dynamic and static routes with both the show ip route and show ip route static commands after these active routes are added in the main routing table.

## Examples

The following is sample output from the show ip route command when entered without an address:

```
Switch# show ip route
Codes: K - kernel, C - connected, S - static, R - RIP, B - BGP
       O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       [*] - [AD/Metric]
       * - candidate default
O       1.1.1.0/24 [110/2] via 10.10.1.1, eth-0-23, 00:34:17
O       2.2.2.0/24 [110/3] via 10.10.1.1, eth-0-23, 00:17:26
C       10.10.1.0/24 is directly connected, eth-0-23
C       10.10.1.23/32 is in local loopback, eth-0-23
O       10.10.2.0/24 [110/2] via 10.10.1.1, eth-0-23, 00:17:26
O       10.10.3.0/24 [110/3] via 10.10.1.1, eth-0-23, 00:17:26
```

## Related Commands

ip route

show ip route database

# 6.1.11 show ip route database

## Command Purpose

To display the Routing Information Base (RIB), use the show ip route database command in user EXEC or privileged EXEC mode.

## Command Syntax

show ip route database ( *VRF NAME* | ) ( *PROTOCOL* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VRF NAME | VRF instance name | A string up to 31 characters |
| PROTOCOL | (Optional) The name of a routing protocol, or the keyword connected, static, or summary. If you specify a routing protocol, use one of the following keywords: bgp, ospf, and rip. | bgp/connected/isis/ospf/rip/static |

## Command Mode

Privileged EXEC

## Default

None

## Usage

You can display all active dynamic and static routes with both the show ip route database and show ip route database static commands after these active routes are added in the Routing Information Base (RIB).

## Examples

The following is sample output from the show ip route database command:

```
Switch# show ip route database
Codes: K - kernel, C - connected, S - static, R - RIP, B - BGP
       O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       [*] - [AD/Metric]
       > - selected route, * - FIB route, p - stale info
O    *> 1.1.1.0/24 [110/2] via 10.10.1.1, eth-0-23, 00:48:58
O    *> 2.2.2.0/24 [110/3] via 10.10.1.1, eth-0-23, 00:32:07
S       6.6.6.0/24 [1/0] via 3.3.3.3 inactive
C    *> 10.10.1.0/24 is directly connected, eth-0-23
C    *> 10.10.1.23/32 is in local loopback, eth-0-23
```

```
O    *> 10.10.2.0/24 [110/2] via 10.10.1.1, eth-0-23, 00:32:07
O    *> 10.10.3.0/24 [110/3] via 10.10.1.1, eth-0-23, 00:32:07
```

### Related Commands

ip route

show ip route

## 6.1.12 show ip protocols

### Command Purpose

To display the parameters and current state of the active routing protocol process, use the show ip protocols command in privileged EXEC mode.

### Command Syntax

show ip protocols ( vrf *NAME* | ) ( *PROTOCOL* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VRF NAME | VRF instance name | A string up to 31 characters |
| PROTOCOL | (Optional) The name of a routing protocol. If you specify a routing protocol, use one of the following keywords: bgp, ospf, isis and rip. | bgp/ospf/rip/isis |

### Command Mode

Privileged EXEC

### Default

None

### Usage

The information displayed by the show ip protocols command is useful in debugging routing operations. Information in the Routing Information Sources field of the

show ip protocols output can help you identify a switch suspected of delivering bad routing information.

### Examples

The following is sample output from the show ip protocols command:

```
Switch# show ip protocols
Routing Protocol is "ospf 0"
  Redistributing:
  Routing for Networks:
    3.3.3.0/24
    10.10.1.0/24
    10.10.4.0/24
  Distance: (default is 110)
```

### Related Commands

show ip route

## 6.1.13 show ip route summary

### Command Purpose

To display the total route count and different types of route count, use the show ip route summary command in privileged EXEC mode.

### Command Syntax

show ip route ( vrf *NAME* | ) summary

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VRF NAME | VRF instance name | A string up to 31 characters |

### Command Mode

Privileged EXEC

### Default

None

## Usage

None

## Examples

The following is sample output from the show ip route summary command:

```
Switch# show ip route summary
IP routing table name is Default-IP-Routing-Table(0)
IP routing table maximum-paths is 8
Route source    networks
connected       2
static           1
Total           3
```

## Related Commands

show ip route

# 6.1.14 show ip route add-fib-fail

## Command Purpose

Use this command to display the routes which can not forward packet because of TCAM resource full. Use the show ip route add-fib-fail command in privileged EXEC mode.

## Command Syntax

show ip route add-fib-fail ( count | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| count | number of add-fib-fail route entries | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

If both of the command line “show ip route” and “show ip route add-fib-file” could show the same route. It represents that the route is not able to inset into the Forwarding Information Table(FIB) due to the hareware resource limit, this route is not able to forward any packets. You could delete and reconfigure this routing when some hardware resource is free.

## Examples

The following is sample output from the show ip route add-fib-fail command:

```
Switch# show ip route add-fib-fail
=====================================
VRF                 Route
default             1.1.1.1/32
default             1.1.1.0/24
test                2.2.2.2/32
test                2.2.2.0/24
```

## Related Commands

show ip route

# 6.1.15 max-static-routes

## Command Purpose

To configure the maximum static routes in system, use the max-static-routes command in global configuration mode. To configure the maximum static routes to default value, use the no form of this command.

## Command Syntax

max-static-routes *COUNT*

no max-static-routes *COUNT*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| COUNT | maximum static routes in system | The range is <1-65535>, default value is 1024 |

### Command Mode

Global Configuration

### Default

1024

### Usage

Users should not configure the maximum static routes more than system profile of FIB. Also, users should not configure the maximum static routes less than the current static routes count.

### Examples

The following example displays how to change maximum static routes to 10:

```
Switch# confi terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# max-static-routes 10
```

### Related Commands

show ip route summary

## 6.1.16 show resource fib

### Command Purpose

Use this command to display the resources used by routes.

### Command Syntax

show resource fib

### Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following is sample output from the show resource fib command:

```
Switch# show resource fib
RIBFIB
Resource                        Used          Capability
============================================================
Indirect Routes                 3             8192
Host Routes                     1             4096
Static Routes                   0             1024
IPv6 Indirect routes            0             1536
IPv6 Host routes                0             4096
IPv6 Static routes              0             1024
L3 Vlan interfaces              0             256
```

## Related Commands

show ip route summary

# 6.1.17 ecmp load-balance-mode dynamic

## Command Purpose

Use this command to configure ecmp dynamic load balance.

## Command Syntax

ecmp load-balance-mode dynamic

no ecmp load-balance-mode dynamic

## Command Mode

Global Configuration

### Default

Static load balance mode

### Usage

When configure or cancel ecmp load balance, the route information must be empty.

### Examples

The following example displays how to configure ecmp dynamic load balance:

```
Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# ecmp load-balance-mode dynamic
```

### Related Commands

None

## 6.1.18 ecmp load-balance-mode dynamic (efd-only | tcp-only)

### Command Purpose

Use this command to configure only tcp flows do ecmp dynamic load or only efd flows do ecmp dynamic load.

### Command Syntax

ecmp load-balance-mode dynamic ( efd-only | tcp-only )

no ecmp load-balance-mode dynamic

### Command Mode

Global Configuration

### Default

Flows of every type can do ecmp dynamic load.

### Usage

None

### Examples

The following example displays how to configure only tcp flows do ecmp dynamic load:

```
Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# ecmp load-balance-mode dynamic tcp-only
```

### Related Commands

None

## 6.1.19 ecmp load-balance-mode static

### Command Purpose

Use this command to configure ecmp static load balance.

### Command Syntax

ecmp load-balance-mode static

### Command Mode

Global Configuration

### Default

None

### Usage

When configure ecmp load balance, the route information must be empty.

### Examples

The following example displays how to configure ecmp static load balance:

```
Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# ecmp load-balance-mode static
```

### Related Commands

None

## 6.1.20 ecmp load-balance-mode static self-healing

### Command Purpose

Use this command to configure ecmp self-healing load balance.

### Command Syntax

ecmp load-balance-mode static self-healing

no ecmp load-balance-mode static self-healing

### Command Mode

Global Configuration

### Default

None

### Usage

None

### Examples

The following example displays how to configure ecmp self-healing load balance:

```
Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# ecmp load-balance-mode static self-healing
```

### Related Commands

None

## 6.1.21 ecmp load-balance-mode round-robin

### Command Purpose

Use this command to configure ecmp round robin load balance.

### Command Syntax

ecmp load-balance-mode round-robin ( vrf *NAME* | ) *A.B.C.D/M*

no ecmp load-balance-mode round-robin ( vrf *NAME* | ) *A.B.C.D/M*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VRF NAME | VRF instance name | A string up to 31 characters |
| A.B.C.D/M | IP destination prefix (e.g. 10.0.0.0/8) | IPv4 address and mask length in A.B.C.D/M format |

### Command Mode

Global Configuration

### Default

None

### Usage

When configure or cancel ecmp load balance, the route information must be empty.

All vrf's prefix cannot add up to more than 15.

### Examples

The following example displays how to configure ecmp round robin load balance:

```
Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# ecmp load-balance-mode round-robin 1.1.1.0/24
```

### Related Commands

None

## 6.1.22 ecmp bandwidth-based-load-balance

### Command Purpose

Use this command to configure ecmp bandwidth-based-load-balance.

### Command Syntax

ecmp bandwidth-based-load-balance enable

no ecmp bandwidth-based-load-balance enable

### Command Mode

Global Configuration

### Default

None

### Usage

None

### Examples

The following example displays how to configure ecmp bandwidth-based-load-balance:

```
Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# ecmp bandwidth-based-load-balance enable
```

### Related Commands

ecmp weighting-bandwidth

## 6.1.23 ecmp weighting-bandwidth

### Command Purpose

Use this command to configure ecmp bandwidth-based-load-ballance weighting bandwidth.

### Command Syntax

ecmp weighting-bandwidth *BANDWIDTH*

no ecmp weighting-bandwidth

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| BANDWIDTH | interface ecmp weighting-bandwidth | 1-100000000 |

### Command Mode

Interface Configuration

### Default

By default, the ecmp weighting-bandwidth is set to 1.

### Usage

None

### Examples

The following example displays how to set ecmp weighting-bandwidth to 100:

```
Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# int eth-0-1
Switch(config-if)# ecmp weighting-bandwidth 100
```

### Related Commands

ecmp bandwidth-based-load-balance

## 6.1.24 show ecmp information

### Command Purpose

Use this command to display ecmp configure information.

### Command Syntax

show ecmp information

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following example shows the output of the command:

```
Switch# show ecmp information
ECMP load balance enable mode: Static
```

### Related Commands

None

# 6.2 RIP Commands

## 6.2.1 default-information originate (RIP)

### Command Purpose

To generate a default route into Routing Information Protocol (RIP), use the default-information originate command in router configuration mode. To disable this feature, use the no form of this command.

### Command Syntax

default-information originate ( route-map | )

no default-information originate ( route-map | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| route-map | Route map reference | - |

### Command Mode

Router Configuration

### Default

None

### Usage

The route orginated will only be learned by RIP neighbor, and this route is not configured in FIB.

### Examples

The following example originates a default route:

```
Switch# configure terminal
Switch(config)# router rip
Switch(config-router)# version 2
Switch(config-router)# network 192.168.16.0/24
Switch(config-router)# default-information originate
```

### Related Commands

None

## 6.2.2 default-metric (RIP)

### Command Purpose

To set default metric values for Routing Information Protocol (RIP), use the default-metric command in router configuration mode. To return to the default state, use the no form of this command.

### Command Syntax

default-metric *NUMBER-VALUE*

no default-metric

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NUMBER-VALUE | Default metric value | 1-16 |

### Command Mode

Router Configuration

### Default

By default, the metric is set to 0.

### Usage

The default-metric command is used in conjunction with the redistribute router configuration command to cause the current routing protocol to use the same metric value for all redistributed routes. A default metric helps solve the problem of redistributing routes with incompatible metrics. Whenever metrics do not convert, using a default metric provides a reasonable substitute and enables the redistribution to proceed.

## Examples

The following example shows a switch using both the RIP and the Open Shortest Path First (OSPF) routing protocols. The example advertises OSPF-derived routes using RIP and assigns the OSPF-derived routes a RIP metric of 10:

```
Switch# configure terminal
Switch(config)# router rip
Switch(config-router)# default-metric 10
Switch(config-router)# redistribute ospf
```

## Related Commands

redistribute (RIP)

# 6.2.3 distance (RIP)

## Command Purpose

To define an administrative distance for routes that are inserted into the routing table, use the distance command in router configuration mode. To return the administrative distance to its default distance definition, use the no form of this command.

## Command Syntax

distance *DISTANCE PREFIX/PREFIX-LENGTH* ( *ACCESSS-LIST-NAME* | )

no distance

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DISTANCE | Administrative distance | Administrative distance, an integer from 1 to 255 (routes with a distance value of 255 are not installed in the routing table) |
| PREFIX | IP prefix for the originator of the imcoming routing updates | IPv4 Address |
| PREFIX-LENGTH | Prefix length for the originator | 1-32 |

| | | |
|---|---|---|
| ACCESSS-LIST-NAME | (Optional) Named access list to be applied to incoming routing updates | Up to 40 characters |

## Command Mode

Router Configuration

## Default

By default, the distance is 120.

## Usage

An administrative distance is a rating of the trustworthiness of a routing information source, such as an individual switch or a group of switches. Numerically, an administrative distance is an integer from 0 to 255. In general, the higher the value, the lower the trust rating. An administrative distance of 255 means the routing information source cannot be trusted at all and should be ignored.

When this command is configured, it is applied when a network is being inserted into the routing table. It filters routing updates according to the IP address of the switch that supplies the routing information. It could be used, for example, to filter possibly incorrect routing information from switches that are not under your administrative control. The optional access list name is used to filter router entries in routing update.

## Examples

The following example set administrative distance 200 for routes that are inserted from 20.20.0.0 network segment :

```
Switch# configure terminal
Switch(config)# router rip
Switch(config-router)# network 10.10.0.0/24
Switch(config-router)# network 20.20.0.0/24
Switch(config-router)# distance 200 20.20.0.0/24
```

## Related Commands

distance (OSPF)

## 6.2.4 ip rip authentication

### Command Purpose

To enable authentication for Routing Information Protocol (RIP) Version 2 packets and to specify the set of keys that can be used on an interface, use the ip rip authentication command in interface configuration mode. To prevent authentication, use the no form of this command.

### Command Syntax

ip rip authentication ( key-chain *NAME-OF-CHAIN* | string *STRING* )

no ip rip authentication ( key-chain | string )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| key-chain NAME-OF-CHAIN | Enables authentication and specifies the group of keys that are valid | A String of key chain name |
| string STRING | Enables authentication and specifies the authentication string | Up to 16 characters |

### Command Mode

Interface Configuration

### Default

No authentication is provided for RIP packets.

### Usage

If neither key chain is configured with the key-chain command nor string is configured with the authentication string command, no authentication is performed on the interface (not even the default authentication). Key chain and authentication string can not be configured on the same interface. If you want configure one, make sure the other is not configured.

### Examples

The following example configures the interface to accept and send any key belonging to the key chain named trees:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport
Switch(config-if)# ip rip authentication key-chain trees
```

### Related Commands

ip rip authentication mode

## 6.2.5 ip rip authentication mode

### Command Purpose

To specify the type of authentication used in Routing Information Protocol (RIP) Version 2 packets, use the ip rip authentication mode command in interface configuration mode. To restore clear text authentication, use the no form of this command.

### Command Syntax

ip rip authentication mode ( text | md5 )

no ip rip authentication mode

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| text | Normal text authentication | - |
| md5 | Keyed Message Digest 5 (MD5) authentication | - |

### Command Mode

Interface Configuration

### Default

Clear text authentication is provided for RIP packets.

## Usage

RIP Version 1 does not support authentication.

## Examples

The following example configures the interface to use MD5 authentication:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport
Switch(config-if)# ip rip authentication mode md5
```

## Related Commands

ip rip authentication key-chain

# 6.2.6 ip rip receive version

## Command Purpose

To specify a Routing Information Protocol (RIP) version to receive on an interface basis, use the ip rip receive version command in interface configuration mode. To follow the global version rules, use the no form of this command.

## Command Syntax

ip rip receive version [ 1 | 2 ]

no ip rip receive version

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| 1 | (Optional) Accepts only RIP Version 1 packets on the interface | - |
| 2 | (Optional) Accepts only RIP Version 2 packets on the interface | - |

## Command Mode

Interface Configuration

### Default

Only RIPv2 packet should be received.

### Usage

Use this command to override the default behavior of RIP as specified by the version command. This command applies only to the interface being configured. You can configure the interface to accept both RIP versions.

### Examples

The following example configures the interface to receive both RIP Version 1 and Version 2 packets:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport
Switch(config-if)# ip rip receive version 1 2
```

### Related Commands

version (RIP)

## 6.2.7 ip rip receive-packet

### Command Purpose

To enable the interface to receive Routing Information Protocol (RIP) packets, use the ip rip receive-packet command in interface configuration mode. To disable to receive RIP packets, use the no form of this command.

### Command Syntax

ip rip receive-packet

no ip rip receive-packet

### Command Mode

Interface Configuration

## Default

Receive packet is enabled by default.

## Usage

Use this command to enable or disable the capability of receiving RIP packets, whether the network of this interface is added into RIP or not.

## Examples

The following example enables the reception of RIP packets:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport
Switch(config-if)# ip rip receive-packet
```

## Related Commands

ip rip receive version

# 6.2.8 ip rip send version

## Command Purpose

To specify a Routing Information Protocol (RIP) version to send on an interface basis, use the ip rip send version command in interface configuration mode. To follow the global version rules, use the no form of this command.

## Command Syntax

ip rip send version ( ( [ 1 | 2 ] ) | 1-compatible )

no ip rip send version

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| 1 | (Optional) Sends only RIP Version 1 packets out the interface | - |
| 2 | (Optional) Sends only RIP Version 2 packets out the interface | - |

| | | |
|---|---|---|
| 1-compatible | (Optional) Sends RIP Version 2 packets out the interface with broadcast IP address | - |

## Command Mode

Interface Configuration

## Default

Only RIPv2 packet should be send.

## Usage

Use this command to override the default behavior of RIP as specified by the version command. This command applies only to the interface being configured. You can configure the interface to send both RIP versions.

## Examples

The following example configures the interface to send both RIP Version 1 and Version 2 packets:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport
Switch(config-if)# ip rip send version 1 2
```

## Related Commands

ip rip receive version

# 6.2.9 ip rip send-packet

## Command Purpose

To enable the interface to send Routing Information Protocol (RIP) packets, use the ip rip send-packet command in interface configuration mode. To disable to send RIP packets, use the no form of this command.

### Command Syntax

ip rip send-packet

no ip rip send-packet

### Command Mode

Interface Configuration

### Default

Send packet is enabled by default.

### Usage

Use this command to enable or disable the capability of sending RIP packets, whether the network of this interface is added into RIP or not.

### Examples

The following example enables the transmission of RIP packets:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport
Switch(config-if)# ip rip send-packet
```

### Related Commands

ip rip send version

## 6.2.10 ip rip split-horizon

### Command Purpose

To enable the split horizon mechanism for Routing Information Protocol (RIP), use the ip rip split-horizon command in interface configuration mode. To disable the split horizon mechanism, use the no form of this command.

## Command Syntax

ip rip split-horizon ( poisoned | )

no ip rip split-horizon

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| poisoned | Split horizon with poisoned reverse | - |

## Command Mode

Interface Configuration

## Default

This command is enabled with poisoned reverse by default.

## Usage

In general, changing the state of the default for the ip rip split-horizon command is not recommended, unless you are certain that your application requires a change in order to properly advertise routes.

## Examples

The following example enables split horizon without poisoned reverse:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport
Switch(config-if)# ip rip split-horizon
```

## Related Commands

None

# 6.2.11 network (RIP)

## Command Purpose

To specify a list of networks for the Routing Information Protocol (RIP) routing process, use the network command in router configuration mode. To remove an entry, use the no form of this command.

## Command Syntax

network ( *PREFIX* / *PREFIX-LENGTH* )

no network ( *PREFIX* / *PREFIX-LENGTH* )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PREFIX | IP route prefix for the network | IPv4 Address |
| PREFIX-LENGTH | Prefix length for the network | 1-32 |

## Command Mode

Router Configuration

## Default

No networks are specified.

## Usage

There is no limit to the number of network commands you can use on the switch. RIP routing updates will be sent and received only through interfaces on this network.

RIP sends updates to the interfaces in the specified networks. Also, if the network of an interface is not specified, the interface will not be advertised in any RIP update.

### Examples

The following example defines RIP as the routing protocol to be used on all interfaces connected to networks 10.99.0.0/16 and 192.168.7.0/24:

```
Switch# configure terminal
Switch(config)# router rip
Switch(config-router)# network 10.99.0.0/16
Switch(config-router)# network 192.168.7.0/24
```

### Related Commands

router rip

## 6.2.12 neighbor (RIP)

### Command Purpose

To define a neighboring switch with which to exchange routing information, use the neighbor command in router configuration mode. To remove an entry, use the no form of this command.

### Command Syntax

neighbor *IP-ADDRESS*

no neighbor *IP-ADDRESS*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IP-ADDRESS | IP address of a peer switch with which routing information will be exchanged | IPv4 Address |

### Command Mode

Router Configuration

### Default

No neighboring switches are defined.

### Usage

This command permits the point-to-point (non-broadcast) exchange of routing information. When it is used in combination with the passive-interface router configuration command, routing information can be exchanged between a subset of switches and access servers on a LAN.

Multiple neighbor commands can be used to specify additional neighbors or peers.

### Examples

In the following example, RIP updates are sent to all interfaces on network 10.108.0.0 except eth-0-1. However, in this case a neighbor switch configuration command is included. This command permits the sending of routing updates to specific neighbors. One copy of the routing update is generated per neighbor:

```
Switch# configure terminal
Switch(config)# router rip
Switch(config-router)# network 10.108.0.0/16
Switch(config-router)# passive-interface eth-0-1
Switch(config-router)# neighbor 10.108.20.4
```

### Related Commands

router rip

## 6.2.13 offset-list (RIP)

### Command Purpose

To add an offset to incoming and outgoing metrics to routes learned via Routing Information Protocol (RIP), use the offset-list command in router configuration mode. To remove an offset list, use the no form of this command.

### Command Syntax

offset-list *ACCESSS-LIST-NAME* ( in | out ) *METRIC-OFFSET* ( *IFNAME* | )

no offset-list ( in | out ) ( *IFNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ACCESSS-LIST-NAME | Named access list to be applied | Up to 40 characters |
| in | Applies the access list to incoming metrics | - |
| out | Applies the access list to outgoing metrics | - |
| METRIC-OFFSET | Positive offset to be applied to metrics for networks matching the access list. If the offset is 0, no action is taken | 0-16 |
| IFNAME | Interface name to which the offset list is applied | Support physical/aggregation/loopback/vlan/tunnel ports |

## Command Mode

Router Configuration

## Default

This command is disabled by default.

## Usage

The offset value is added to the routing metric. An offset list with an interface is considered extended and takes precedence over an offset list that is not extended. Therefore, if an entry passes the extended offset list and the normal offset list, the offset of the extended offset list is added to the metric.

## Examples

In the following example, the switch applies an offset to the delay component of a switch only to access list 21:

```
Switch# configure terminal
Switch(config)# router rip
Switch(config-router)# offset-list 21 out 10
```

## Related Commands

None

## 6.2.14 passive-interface (RIP)

### Command Purpose

To disable sending routing updates for the Routing Information Protocol (RIP) on an interface, use the passive-interface command in router configuration mode. To re-enable the sending of routing updates, use the no form of this command.

### Command Syntax

passive-interface *IFNAME*

no passive-interface *IFNAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | The interface name | Support physical/aggregation/loopback/vlan/tunnel ports |

### Command Mode

Router Configuration

### Default

Routing updates are sent on the interface.

### Usage

If you disable the sending of routing updates on an interface, the particular subnet will continue to be advertised to other interfaces, and updates from other switches on that interface continue to be received and processed.

### Examples

The following example sets the interface eth-0-1 as passive:

```
Switch# configure terminal
Switch(config)# router rip
Switch(config-router)# network 10.108.0.0/16
Switch(config-router)# passive-interface eth-0-1
```

### Related Commands

router rip

## 6.2.15 redistribute (RIP)

### Command Purpose

To redistribute routes from one routing domain into RIP routing domain, use the redistribute command in router configuration mode. To disable redistribution, use the no form of this command.

### Command Syntax

redistribute *PROTOCOL* { [ metric *VALUE* ] | route-map *WORD* }

no redistribute *PROTOCOL*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PROTOCOL | (Optional) The name of a routing protocol, or the keyword connected, or static. If you specify a routing protocol, use one of the following keywords: bgp, and ospf , connected,isis | bgp/ospf/connected/isis/static/isis |
| metric VALUE | (Optional) When redistributing other routing process to the RIP process, the default metric is 0 if no metric value is specified | 1-16 |
| route-map | Route map reference | - |
| WORD | Pointer to route-map entries | Up to 20 characters |

### Command Mode

Router Configuration

### Default

Route redistribution is disabled.

Metric metric-value: 0

### Usage

The metric value specified in the redistribute command supersedes the metric value specified using the default-metric command.

### Examples

The followings examples redistribute the static routes into RIP with metric 10:

```
Switch# configure terminal
Switch(config)# router rip
Switch(config-router)# network 10.108.0.0/16
Switch(config-router)# redistribute static metric 10
```

### Related Commands

default-metric

## 6.2.16 router rip

### Command Purpose

To configure the Routing Information Protocol (RIP) routing process, use the router rip command in global configuration mode. To turn off the RIP routing process, use the no form of this command.

### Command Syntax

router rip

no router rip

### Command Mode

Global Configuration

### Default

None

## Usage

None

## Examples

The following example shows how to enter the RIP routing configuration:

```
Switch# configure terminal
Switch(config)# router rip
```

## Related Commands

network (RIP)

# 6.2.17 timers basic (RIP)

## Command Purpose

To adjust Routing Information Protocol (RIP) network timers, use the timers basic command in router configuration mode. To restore the default timers, use the no form of this command.

## Command Syntax

timers basic *UPDATE TIMEOUT INVALID*

no timers basic

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| UPDATE | Rate (in seconds) at which updates are sent. This is the fundamental timing parameter of the routing protocol. | <5-2147483647>, default 30s |
| TIMEOUT | Time (in seconds) after which a route is declared invalid without updates that refresh the route. The route then enters into an invalid state and is not used for forwarding packets. | It is marked inaccessible and advertised as unreachable. <5-2147483647>, default 180s |

| | | |
|---|---|---|
| INVALID | Time after which an invalid route is removed from RIP routing database. | <5-2147483647>, default 120s |

## Command Mode

Router Configuration

## Default

update: 30 seconds

timeout: 180 seconds

invalid: 120 seconds

## Usage

The basic timing parameters for RIP are adjustable. Because RIP is executing a distributed, asynchronous routing algorithm, these timers must be the same for all switches and access servers in the network.

In addition, an address family can have explicitly specified timers that apply to that address-family only. The timers basic command must be specified for an address family or the system Default for the timers basic command are used regardless of what is configured for RIP routing.

## Examples

The following example sets updates to be broadcast every 5 seconds. If a switch is not heard from in 15 seconds, the route is declared unusable. And after 15 seconds the invalid route will be removed from RIP routing database:

```
Switch# configure terminal
Switch(config)# router rip
Switch(config-router)# timers basic 5 15 15
```

## Related Commands

None

# 6.2.18 show ip rip database

## Command Purpose

Use this command to display RIP information database.

## Command Syntax

show ip rip database ( vrf *WORD* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| vrf WORD | VPN Routing/Forwarding instance | Up to 31 characters |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following is sample output from the show ip rip database command:

```
Switch# show ip rip database
Codes: R - RIP, Rc - RIP connected, Rs - RIP static, K - Kernel,
       C - Connected, S - Static, O - OSPF, I - IS-IS, B - BGP
   Network        Next Hop        Metric From       If       Time
Rc 1.1.1.0/24                           0           eth-0-1
Rc 2.2.2.0/24                           0           eth-0-2
Rc 10.0.0.0/24                          0           vlan10
```

## Related Commands

show ip rip interface

# 6.2.19 show ip rip interface

## Command Purpose

To display summary information of Routing Information Protocol (RIP) for a specific interface, use the show ip rip interface command in privileged EXEC mode.

## Command Syntax

show ip rip interface ( *IFNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | The interface name | Support physical/aggregation/loopback/tunnel/vlan interfaces |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following is sample output from the show ip rip interface command:

```
Switch# show ip rip interface eth-0-1
eth-0-1 is up, line protocol is up
  Routing Protocol: RIP
    Receive RIP packets
    Send RIP packets
    Passive interface: Disabled
    Split horizon: Enabled with Poisoned Reversed
    IP interface address:
      1.1.1.1/24
```

### Related Commands

show ip rip database

## 6.2.20 version (RIP)

### Command Purpose

To specify a Routing Information Protocol (RIP) version used globally by the router, use the version command in router configuration mode. To restore the default value, use the no form of this command.

### Command Syntax

version ( 1 | 2 )

no version

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| 1 | Specifies RIP Version 1 | - |
| 2 | Specifies RIP Version 2 | - |

### Command Mode

Router Configuration

### Default

System receives only RIP Version 2 packets, and sends only Version 2 packets.

### Usage

To specify RIP versions used on an interface basis, use the ip rip receive version and ip rip send version commands.

### Examples

The following example enables the software to send and receive RIP Version 2 packets:

```
Switch# configure terminal
Switch(config)# router rip
Switch(config-router)# version 2
```

### Related Commands

ip rip receive version

ip rip send version

## 6.2.21 distribute-list

### Command Purpose

To Filter networks in routing updates, use the distribute-list command in router configuration mode. To restore the default value, use the no form of this command.

### Command Syntax

distribute-list ( prefix | ) *WORD* ( in | out )

no distribute-list ( prefix | ) *WORD* ( in | out )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| prefix | Filter prefixes in routing update | - |
| WORD | Access-list name | Up to 40 characters |
| in | Filter incoming routing updates | - |
| out | Filter outgoing routing updates | - |

### Command Mode

Router Configuration

### Default

None

### Usage

None

### Examples

The following example filters all routes from RIP:

```
Switch# configure terminal
Switch(config)# router rip
Switch(config-router)# distribute-list prefix 1 in
```

### Related Commands

ip prefix-list

## 6.2.22 address-family

### Command Purpose

Use the command enter Address Family command mode in router configuration mode.

### Command Syntax

address-family ipv4 vrf *WORD*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| WORD | VPN Routing/Forwarding instance name | Up to 31 characters |

### Command Mode

Router Configuration

### Default

N/A

### Usage

None

### Examples

The following example shows how to enter Address Family command mode:

```
Switch# configure terminal
Switch(config) router bgp 100
Switch(config-router)address-family ipv4
```

### Related Commands

None

## 6.2.23 show ip protocol rip

### Command Purpose

To show Routing Information Protocol (RIP), use the show ip protocol rip command in in privileged EXEC mode.

### Command Syntax

show ip protocol rip

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following is sample output from the show ip rip interface command:

```
Switch# show ip protocol rip
Routing protocol is "rip"
  Sending updates every 30 seconds with +/-5 seconds
  Timeout after 180 seconds, Garbage collect after 120 seconds
  Outgoing update filter list for all interface is not set
  Incoming update filter list for all interface is not set
  Default redistribution metric is 0
  Redistributing:
```

```
  connected  metric default
Default version control: send version 2, receive version 2
  Interface        Send          Recv   Key-chain
Routing for Networks:
  10.10.11.0/24
Routing Information Sources:
  Gateway          Distance  Last Update  Bad Packets  Bad Routes
Number of routes (including connected): 0
Distance: (default is 120)
```

### Related Commands

None

## 6.2.24 debug rip

### Command Purpose

Use this command to specify the options for the displayed debugging information for RIP events, RIP packets. Use the no parameter with this command to disable all debugging.

### Command Syntax

debug rip ( all | events | *PACKET* | )

no debug rip ( all | events | *PACKET* | )

no debug all ( rip | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| all | All RIP debug information | - |
| events | RIP events debug information is displayed | - |
| PACKET | packet (recv\|send) (detail) Specifies RIP packets only | - |
| recv | Specifies that information for received packets be displayed | - |
| send | Specifies that information for sent packets be displayed | - |
| detail | Displays detailed information for the sent or received packet | - |

### Command Mode

Privileged EXEC

### Default

Disabled

### Usage

None

### Examples

The following example displays information about the rip packets that are received and sent out from the connected router:

```
Switch# debug rip packet
```

### Related Commands

show debugging rip

## 6.2.25 show debugging rip

### Command Purpose

Use this command to display the RIP debugging status for these debugging options: nsm debugging, RIP event debugging, RIP packet debugging.

### Command Syntax

show debugging rip

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following is sample output from the show debugging rip command:

```
Switch# show debuging rip
RIP debugging status:
  RIP packet debugging is on
```

### Related Commands

debug rip

## 6.2.26 show ip rip database database-summary

### Command Purpose

Use this command to display the statistics for RIP routes.

### Command Syntax

show ip rip database database-summary ( vrf *NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| vrf NAME | VPN Routing/Forwarding instance | Up to 31 characters |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following is sample output from the show ip rip database database-summary command:

```
Switch# show ip rip database database-summary
Type                  Count
RIP connected       1
RIP                   1
Total                 2
```

### Related Commands

show ip rip database

## 6.2.27 show resource rip

### Command Purpose

Use this command to display the route resources used by RIP protocol.

### Command Syntax

show resource rip

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following is sample output from the show resource rip command:

```
Switch# show resource rip
RIP
Resource                 Used          Capability
================================================
Routes                    2             6144
```

### Related Commands

show ip rip database

## 6.3 OSPF Commands

### 6.3.1 area authentication

### Command Purpose

To enable authentication for an Open Shortest Path First (OSPF) area, use the area authentication command in router configuration mode. To remove an authentication specification of an area or a specified area from the configuration, use the no form of this command.

### Command Syntax

area *AREA-ID* authentication ( message-digest | )

no area *AREA-ID* authentication

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| AREA-ID | Identifier of the area for which authentication is to be enabled. The identifier can be specified as either a decimal value or an IP address | IP address or number in the range of 0-4294967295 |
| message-digest | (Optional) Enables Message Digest 5 (MD5) authentication on the area specified by the area-id argument | - |

## Command Mode

Router Configuration

## Default

Type 0 authentication (no authentication)

## Usage

Specifying authentication for an area sets the authentication to Type 1 (simple password) as specified in RFC 1247. If this command is not included in the configuration file, authentication of Type 0 (no authentication) is assumed.

The authentication type must be the same for all routers and access servers in an area. The authentication password for all OSPF routers on a network must be the same if they are to communicate with each other via OSPF. Use the ip ospf authentication-key interface command to specify this password.

If you enable MD5 authentication with the message-digest keyword, you must configure a password with the ip ospf message-digest-key interface command.

To remove the authentication specification for an area, use the no form of this command with the authentication keyword.

## Examples

The following example mandates authentication for areas 0 and 10.0.0.0 of OSPF routing process 201. Authentication keys are also provided:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport
Switch(config-if)# ip address 192.168.251.201/24
Switch(config-if)# ip ospf authentication-key adcdefgh
Switch(config)# interface eth-0-2
Switch(config-if)# no switchport
Switch(config-if)# ip address 10.56.0.201/16
Switch(config-if)# ip ospf authentication-key ijklmnop
Switch(config)# router ospf 201
Switch(config-router)# network 10.0.0.0 0.255.255.255 area 10.0.0.0
Switch(config-router)# network 192.168.0.0/16 area 0
Switch(config-router)# area 10.0.0.0 authentication
Switch(config-router)# area 0 authentication
```

### Related Commands

ip ospf authentication-key

## 6.3.2 area default-cost

### Command Purpose

To specify a cost for the default summary route sent into a stub, use the area default-cost command in router configuration mode. To remove the assigned default route cost, use the no form of this command.

### Command Syntax

area *AREA-ID* default-cost *COST*

no area *AREA-ID* default-cost

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| AREA-ID | Identifier of the area for which authentication is to be enabled. The identifier can be specified as either a decimal value or an IP address | IP address or number in the range of 0-4294967295 |
| COST | default cost value | 0-16777214 |

### Command Mode

Router Configuration

### Default

COST: 1

### Usage

The command is used only on an Area Border Router (ABR) attached to a stub.

There are two stub area router configuration commands: the stub and default-cost options of the area command. In all routers and access servers attached to the stub area, the area should be configured as a stub area using the stub option of the area

command. Use the default-cost option only on an ABR attached to the stub area. The default-cost option provides the metric for the summary default route generated by the ABR into the stub area.

### Examples

The following example shows how to configure a stub area and set its COST value:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport
Switch(config-if)# ip address 10.56.0.201/16
Switch(config)# router ospf 201
Switch(config-router)# network 10.0.0.0/8 area 10.0.0.0
Switch(config-router)# area 10.0.0.0 stub
Switch(config-router)# area 10.0.0.0 default-cost 20
```

### Related Commands

None

## 6.3.3 area filter-list

### Command Purpose

To filter prefixes advertised in type 3 link-state advertisements (LSAs) between Open Shortest Path First (OSPF) areas of an Area Border Router (ABR), use the area filter-list command in router configuration mode. To change or cancel the filter, use the no form of this command.

### Command Syntax

area *AREA-ID* filter-list ( access *ACCESSS-LIST-NAME* | prefix *PREFIX-LIST-NAME* ) ( in | out )

no area *AREA-ID* filter-list ( access *ACCESSS-LIST-NAME* | prefix *PREFIX-LIST-NAME* ) ( in | out )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| AREA-ID | Identifier of the area for which authentication is to be enabled. The identifier can be specified as either a decimal value or an IP address | IP address or number in the range of 0-4294967295 |
| access | Indicates that an accesslist is used | - |
| ACCESSS-LIST-NAME | Name of an access list | A string with 1-20 characters |
| prefix | Indicates that a prefix list is used | - |
| PREFIX-LIST-NAME | Name of a prefix list | A string with 1-20 characters |
| in | Access list or prefix list applied to prefixes advertised to the specified area from other areas | - |
| out | Access list or prefix list applied to prefixes advertised out of the specified area to other areas | - |

## Command Mode

Router Configuration

## Default

This command has no default behavior.

## Usage

With this feature enabled in the “in” direction, all type 3 LSAs originated by the ABR to this area, based on information from all other areas, are filtered by the prefix list. Type 3 LSAs that were originated as a result of the area range command in another area are treated like any other type 3 LSA that was originated individually. Any prefix that does not match an entry in the prefix list is implicitly denied.

With this feature enabled in the "out" direction, all type 3 LSAs advertised by the ABR, based on information from this area to all other areas, are filtered by the prefix list. If the area range command has been configured for this area, type 3 LSAs that correspond to the area range are sent to all other areas, only if at least one prefix in the area range matches an entry in the prefix list.

If all specific prefixes are denied by the prefix list, type 3 LSAs that correspond to the area range command will not be sent to any other area. Prefixes that are not permitted by the prefix list are implicitly denied.

### Examples

The following example filters prefixes that are sent from all other areas to area 1:

```
Switch# configure terminal
Switch(config)# router ospf 201
Switch(config-router)# area 1 filter-list prefix AREA_1 in
```

### Related Commands

area range

## 6.3.4 area range

### Command Purpose

To consolidate and summarize routes at an area boundary, use the area range command in router configuration mode. To disable this function, use the no form of this command.

### Command Syntax

area *AREA-ID* range ( *ADDRESS MASK* | *ADDRESS* / *PREFIX-LENGTH* ) ( advertise | not-advertise | )

no area *AREA-ID* range ( *ADDRESS MASK* | *ADDRESS* / *PREFIX-LENGTH* }

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| AREA-ID | Identifier of the area for which authentication is to be enabled. The identifier can be specified as either a decimal value or an IP address | IP address or number in the range of 0-4294967295 |
| ADDRESS | IPv4 address | IPv4 Address |
| PREFIX-LENGTH | Prefix length of the address | 1-32 |
| advertise | Advertise this range (default) | - |
| not-advertise | Do not advertise this range | - |

## Command Mode

Router Configuration

## Default

This command is disabled by default.

## Usage

The area range command is used only with Area Border Routers (ABRs). It is used to consolidate or summarize routes for an area. The result is that a single summary route is advertised to other areas by the ABR. Routing information is condensed at area boundaries. External to the area, a single route is advertised for each address range. This behavior is called route summarization.

Multiple area router configuration commands specifying the range option can be configured. Thus, OSPF can summarize addresses for many different sets of address ranges.

## Examples

The following example specifies one summary route to be advertised by the ABR to other areas for all subnets on network 10.0.0.0 and for all hosts on network 192.168.110.0:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
```

```
Switch(config-if)# no switchport
Switch(config-if)# ip address 192.168.110.201/24
Switch(config)# interface eth-0-2
Switch(config-if)# no switchport
Switch(config-if)# ip address 192.168.120.201/24
Switch(config)# interface eth-0-3
Switch(config-if)# no switchport
Switch(config-if)# ip address 10.0.0.0/8
Switch(config)# router ospf 201
Switch(config-router)# network 192.168.110.0/24 area 0
Switch(config-router)# area 10.0.0.0 range 10.0.0.0/8
Switch(config-router)# area 0 range 192.168.110.0 255.255.0.0
```

### Related Commands

None

## 6.3.5 area stub

### Command Purpose

To define an area as a stub area, use the area stub command in router configuration mode. To disable this function, use the no form of this command.

### Command Syntax

area *AREA-ID* stub ( no-summary | )

no area *AREA-ID* stub ( no-summary | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| AREA-ID | Identifier of the area for which authentication is to be enabled. The identifier can be specified as either a decimal value or an IP address | IP address or number in the range of 0-4294967295 |
| no-summary | (Optional) Prevents an Area Border Router (ABR) from sending summary link advertisements into the stub area | - |

### Command Mode

Router Configuration

## Default

No stub area is defined.

## Usage

You must configure the area stub command on all routers and access servers in the stub area. Use the area router configuration command with the default-cost keyword to specify the cost of a default internal router sent into a stub area by an ABR.

There are two stub area router configuration commands: the stub and default-cost options of the area router configuration command. In all routers attached to the stub area, the area should be configured as a stub area using the stub keyword of the area command. Use the default-cost keyword only on an ABR attached to the stub area. The default-cost keyword provides the metric for the summary default route generated by the ABR into the stub area.

To further reduce the number of link-state advertisements (LSAs) sent into a stub area, you can configure the no-summary keyword on the ABR to prevent it from sending summary LSAs (LSA type 3) into the stub area.

## Examples

The following example shows how to configure a stub area and set its COST value:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport
Switch(config-if)# ip address 10.56.0.201/16
Switch(config)# router ospf 201
Switch(config-router)# network 10.0.0.0/8 area 10.0.0.0
Switch(config-router)# area 10.0.0.0 stub
Switch(config-router)# area 10.0.0.0 default-cost 20
```

## Related Commands

None

## 6.3.6 area nssa

### Command Purpose

To define an area as a NSSA area, use the area nssa command in router configuration mode. To disable this function, use the no form of this command.

### Command Syntax

area *AREA-ID* nssa ( translator-role ( candidate | never | always ) | ) ( no-summary | ) ( no-redistribution | ) ( default-information-originate { metric *METRIC_VALUE* | metric-type *TYPE-VALUE* | } | )

no area *AREA-ID* nssa ( translator-role | ) ( no-summary | ) ( no-redistribution | ) ( default-information-originate | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| AREA-ID | Identifier of the area for which authentication is to be enabled. The identifier can be specified as either a decimal value or an IP address | IP address or number in the range of 0-4294967295 |
| candidate | (Optional) Configure the role for ABR in NSSA area as candidate for the translator router | - |
| never | (Optional) Configure the role for ABR in NSSA area as non-translator router | - |
| always | (Optional) Configure the role for ABR in NSSA area as the specified translator router | - |
| no-summary | (Optional) Prevents an Area Border Router (ABR) from sending Summary LSAs into the NSSA area | - |
| no-redistribution | (Optional) Prevents an Area Border Router (ABR) from importing routes into the NSSA area | - |
| default-information-originate | (Optional) Configure an ASBR to send default type 7 LSA into the NSSA area | - |

| | | |
|---|---|---|
| metric METRIC_VALUE | (Optional) Configure metric for the default originate route | 0-16777214 |
| metric-type TYPE-VALUE | (Optional) Configure metric type for the default originate route | 1-2 |

## Command Mode

Router Configuration

## Default

No NSSA area is defined.

## Usage

No NSSA area is configured as default. You must configure the area nssa command on all routers and access servers in the NSSA area.

There are many similarities between NSSA and stub area, neither of which propagates external routes from other area. The difference is that NSSA area can introduce and propagate external routes to the OSPF autonomous domain, while STUB area can not introduce external routes.

## Examples

The following example shows how to configure a NSSA area :

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport
Switch(config-if)# ip address 10.56.0.201/16
Switch(config)# router ospf 201
Switch(config-router)# network 10.0.0.0/8 area 10.0.0.0
Switch(config-router)# area 10.0.0.0 nssa
```

## Related Commands

None

## 6.3.7 auto-cost

### Command Purpose

To control how Open Shortest Path First (OSPF) calculates default metrics for the interface, use the auto-cost command in router configuration mode. To assign cost based only on the interface type, use the no form of this command.

### Command Syntax

auto-cost reference-bandwidth *RATE*

no auto-cost reference-bandwidth

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| RATE | Rate in Mbps (bandwidth). | 1-4294967 |

### Command Mode

Router Configuration

### Default

100 Mbps

### Usage

The value set by the ip ospf cost command overrides the cost resulting from the auto-cost command.Bandwidth dividing port rate is cost.

### Examples

The following example changes the cost of the cost link to 1GBps:

```
Switch# configure terminal
Switch(config)# router ospf 1
Switch(config-router)# auto-cost reference-bandwidth 1000
```

### Related Commands

ip ospf cost

# 6.3.8 clear ip ospf

## Command Purpose

To clear redistribution based on the Open Shortest Path First (OSPF) routing process ID, use the clear ip ospf command in privileged EXEC mode.

## Command Syntax

clear ip ospf ( *PID* | ) process

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PID | (Optional) Process ID | 0-65535 |

## Command Mode

Privileged EXEC

## Default

None

## Usage

Use the PID argument to clear only one OSPF process. If the PID argument is not specified, all OSPF processes are cleared.

## Examples

The following example clears all OSPF processes:

```
Switch# clear ip ospf process
```

## Related Commands

None

## 6.3.9 compatible rfc1583

### Command Purpose

To restore the method used to calculate summary route costs per RFC 1583, use the compatible rfc1583 command in router configuration mode. To disable RFC 1583 compatibility, use the no form of this command.

### Command Syntax

compatible rfc1583

no compatible rfc1583

### Command Mode

Router Configuration

### Default

Not compatible with RFC 1583.

### Usage

To minimize the chance of routing loops, all Open Shortest Path First (OSPF) routers in an OSPF routing domain should have RFC compatibility set identically.

Because of the introduction of RFC 2328, OSPF Version 2, the method used to calculate summary route costs has changed. Use the no compatible rfc1583 command to enable the calculation method used per RFC 2328.

### Examples

The following example specifies that the router process is compatible with RFC 1583:

```
Switch# configure terminal
Switch(config)# router ospf 1
Switch(config-router)# compatible rfc1583
```

## Related Commands

None

# 6.3.10 default-information originate (OSPF)

## Command Purpose

To generate a default external route into an Open Shortest Path First (OSPF) routing domain, use the default-information originate command in router configuration mode. To disable this feature, use the no form of this command.

## Command Syntax

default-information originate ( route-map *WORD* | always | metric *METRIC-VALUE* | metric-type *TYPE-VALUE* | )

no default-information originate ( route-map *WORD* | always | metric | metric-type | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| always | (Optional) Always advertises the default route regardless of whether the system has a default route | - |
| metric METRIC-VALUE | metric-value (Optional) Metric used for generating the default route. If you omit a value and do not specify a value using the default-metric router configuration command, the default metric value is 1. | 0-16777214 |
| metric-type TYPE-VALUE | (Optional) External link type associated with the default route advertised into the OSPF routing domain.It can be type 1 or type 2 LSA | 1-2 |
| route-map WORD | Route map reference | A string with 1-20 characters |

## Command Mode

Router Configuration

## Default

This command is disabled by default.

## Usage

Whenever you use the redistribute or the default-information router configuration command to redistribute routes into an OSPF routing domain, the switch automatically becomes an autonomous System Boundary Router (ASBR). However, an ASBR does not, by default, generate a default route into the OSPF routing domain. The system still must have a default route for itself before it generates one, except when you have specified the always keyword.

## Examples

The following example specifies a metric for the default route redistributed into the OSPF routing domain and an external metric type:

```
Switch# configure terminal
Switch(config)# router ospf 109
Switch(config-router)# redistribute rip metric 100
Switch(config-router)# default-information originate metric 100 metric-type 1
```

## Related Commands

redistribute (OSPF)

# 6.3.11 default-metric (OSPF)

## Command Purpose

To set default metric values for the Open Shortest Path First (OSPF) routing protocol, use the default-metric command in router configuration mode. To return to the default state, use the no form of this command.

## Command Syntax

default-metric *METRIC-VALUE*

no default-metric

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| METRIC-VALUE | Default metric value appropriate for the specified routing protocol. | 0-16777214 |

## Command Mode

Router Configuration

## Default

1 for BGP routes

20 for others

## Usage

The default-metric command is used in conjunction with the redistribute router configuration command to cause the current routing protocol to use the same metric value for all redistributed routes.

## Examples

The example advertises OSPF-derived routes using RIP and assigns the Internal Gateway Protocol (IGP)-derived routes a RIP metric of 10.:

```
Switch# configure terminal
Switch(config)# router ospf
Switch(config-router)# default-metric 10
Switch(config-router)# redistribute rip
```

## Related Commands

redistribute (OSPF)

# 6.3.12 distance (OSPF)

## Command Purpose

To define Open Shortest Path First (OSPF) route administrative distances based on route type, use the distance command in router configuration mode. To restore the default value, use the no form of this command.

## Command Syntax

distance { *DISTANCE* | ospf [ external *DIST1* ] [ inter-area *DIST2* ] | [ intra-area *DIST3* ] }

no distance { *DISTANCE* | ospf }

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DISTANCE | Administrative distance. An integer from 1 to 255. (Routes with a distance value of 255 are not installed in the routing table.) | 1-255 |
| external DIST1 | (Optional) Sets the distance for routes from other routing domains, learned by redistribution. Range is 1 to 255. | 1-255 |
| inter-area DIST2 | (Optional) Sets the distance for all routes from one area to another area. Range is 1 to 255. | 1-255 |
| intra-area DIST3 | (Optional) Sets the distance for all routes within an area. Range is 1 to 255. | 1-255 |

## Command Mode

Router Configuration

## Default

DIST1: 110

DIST2: 110

DIST3: 110

## Usage

You may specify one of the keywords or use distance only to apply to all types of routes.

The distance command allows you to set a distance for an entire group of routes, rather than a specific route that passes an access list.

A common reason to use the distance command is when you have multiple OSPF processes with mutual redistribution, and you want to prefer internal routes from one over external routes from the other.

## Examples

The example advertises OSPF-derived routes using RIP and assigns the Internal Gateway Protocol (IGP)-derived routes a RIP distance of 90:

```
Switch# configure terminal
Switch(config)# router ospf
Switch(config-router)# distance 90
Switch(config-router)# redistribute rip
```

## Related Commands

None

# 6.3.13 distribute-list (OSPF)

## Command Purpose

To filter networks received in updates or suppress networks from being advertised in updates, use the distribute-list command in router configuration mode. To cancel this function, use the no form of this command.

## Command Syntax

distribute-list prefix *PREIFX-LIST-NAME* ( in | out )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PREFIX-LIST-NAME | Name of a prefix list to be applied | A string with 1-20 characters |

## Command Mode

Router Configuration

## Default

None

## Usage

This command must specify an access list.

## Examples

In the following example, OSPF process 1 is configured to accept network 20.0.0.0/8.:

```
Switch# configure terminal

Switch(config)# ip prefix-list plist permit 20.0.0.0/8


Switch(config)# router ospf
Switch(config-router)# network 20.0.0.0/8 area 0
Switch(config-router)# distribute-list prefix plist in
```

## Related Commands

None

# 6.3.14 distribute-list (OSPF)

## Command Purpose

To filter networks received in updates or suppress networks from being advertised in updates, use the distribute-list command in router configuration mode. To cancel this function, use the no form of this command.

## Command Syntax

distribute-list *ACCESSS-LIST-NAME* ( in | out )

no distribute-list *ACCESSS-LIST-NAME* ( in | out )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ACCESSS-LIST-NAME | Name of an access list to be applied | A string with 1-20 characters |
| in | Filter networks received in updates | - |
| out | Suppress networks from being advertised in updates | - |

## Command Mode

Router Configuration

## Default

None

## Usage

This command must specify an access list.

## Examples

In the following example, OSPF process 1 is configured to accept two networks, network 20.0.0.0 and network 10.108.0.0:

```
Switch# configure terminal
Switch(config)# ip access-list acl1
Switch(config-ip-acl)# permit any 20.0.0.0 0.0.255.255 any
Switch(config-ip-acl)# permit any 10.108.0.0 0.0.255.255 any
Switch(config-ip-acl)# deny any any any
Switch(config)# router ospf 1
Switch(config-router)# network 10.108.0.0/16 area 1
Switch(config-router)# distribute-list acl1 in
```

## Related Commands

ip access-list

# 6.3.15 ip ospf authentication

## Command Purpose

To specify the authentication type for an interface, use the ip ospf authentication command in interface configuration mode. To remove the authentication type for an interface, use the no form of this command.

## Command Syntax

ip ospf authentication ( message-digest | null | )

no ip ospf authentication

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| message-digest | (Optional) Specifies that message-digest authentication will be used | - |
| null | (Optional) No authentication is used. Useful for overriding password or message-digest authentication if configured for an area | - |

## Command Mode

Interface Configuration

## Default

The area default is no authentication (null authentication).

## Usage

Before using the ip ospf authentication command, configure a password for the interface using the ip ospf authentication-key command. If you use the ip ospf authentication message-digest command, configure the message-digest key for the interface with the ip ospf message-digest-key command.

## Examples

The following example enables message-digest authentication:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ip ospf authentication message-digest
```

## Related Commands

area authentication

ip ospf authentication-key

ip ospf message-digest-key

# 6.3.16 ip ospf authentication-key

## Command Purpose

To assign a password to be used by neighboring routers that are using the Open Shortest Path First (OSPF) simple password authentication, use the ip ospf authentication-key command in interface configuration mode. To remove a previously assigned OSPF password, use the no form of this command.

## Command Syntax

ip ospf authentication-key ( 8 | ) *PASSWORD*

no ip ospf authentication-key

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PASSWORD | Any continuous printable string of characters that can be entered from the keyboard up to 8 bytes in length | A string with 8 characters |
| (8\|) | Specifies a hidden password will follow | - |

## Command Mode

Interface Configuration

## Default

No password is specified.

## Usage

The password created by this command is used as a "key" that is inserted directly into the OSPF header when the switch originates routing protocol packets. A separate password can be assigned to each network on a per-interface basis. All neighboring routers on the same network must have the same password to be able to exchange OSPF information.

## Examples

The following example enables the authentication key with the string yourpass:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport
Switch(config-if)# ip ospf authentication-key yourpass
```

The following example enables the authentication key with the encrypt password 91c38996a1aa5699:

```
Switch# configure terminal
Switch(config)# interface eth-0-2
Switch(config-if)# no switchport
Switch(config-if)# ip ospf authentication-key 8 91c38996a1aa5699
```

## Related Commands

area authentication

ip ospf authentication

# 6.3.17 ip ospf cost

## Command Purpose

To explicitly specify the cost of sending a packet on an interface, use the ip ospf cost command in interface configuration mode. To reset the path cost to the default value, use the no form of this command.

## Command Syntax

ip ospf cost *INTERFACE-COST*

no ip ospf cost

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INTERFACE-COST | The cost of sending a packet on an interface | 1-65535 |

## Command Mode

Interface Configuration

## Default

Different port rate has different default cost.

## Usage

You can set the metric manually using this command, if you need to change the default. Using the bandwidth command changes the link cost as long as this command is not used.

## Examples

The following example sets the interface cost value to 65:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport
Switch(config-if)# ip ospf cost 65
```

## Related Commands

auto-cost reference bandwidth

# 6.3.18 ip ospf database-filter all out

## Command Purpose

To filter outgoing link-state advertisements (LSAs) to an Open Shortest Path First (OSPF) interface, use the ip ospf database-filter all out command in interface configuration mode. To restore the forwarding of LSAs to the interface, use the no form of this command.

## Command Syntax

ip ospf database-filter all out

no ip ospf database-filter

## Command Mode

Interface Configuration

## Default

This command is disabled by default. All outgoing LSAs are flooded to the interface.

## Usage

OSPF floods new LSAs over all interfaces in an area, except the interface on which the LSA arrives. This redundancy ensures robust flooding. However, too much redundancy can waste bandwidth and might lead to excessive link and CPU usage in certain topologies, resulting in destabilizing the network. To avoid this, use the database-filter command to block flooding of LSAs over specified interfaces.

## Examples

The following example prevents flooding of OSPF LSAs to broadcast, nonbroadcast, or point-to-point networks reachable through the interface eth-0-1:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport
Switch(config-if)# ip ospf database-filter all out
```

## Related Commands

None

# 6.3.19 ip ospf dead-interval

## Command Purpose

To set the interval during which at least one hello packet must be received from a neighbor before the router declares that neighbor down, use the ip ospf dead-interval command in interface configuration mode. To restore the default value, use the no form of this command.

## Command Syntax

ip ospf dead-interval *SECONDS*

no ip ospf dead-interval

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SECONDS | The interval during which at least one hello packet must be received from a neighbor before the router declares that neighbor down. The value must be the same for all nodes on the network | 1-65535 |

## Command Mode

Interface Configuration

## Default

SECONDS: The neighbor is been considered as dead in 40s by default.

## Usage

The dead interval is advertised in OSPF hello packets. This value must be the same for all networking devices on a specific network.

Specifying a smaller dead interval (seconds) will give faster detection of a neighbor being down and improve convergence, but might cause more routing instability.

## Examples

The following example sets the OSPF dead interval to 20 seconds:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport
Switch(config-if)# ip ospf dead-interval 20
```

## Related Commands

ip ospf hello-interval

show ip ospf interface

# 6.3.20 ip ospf hello-interval

## Command Purpose

To specify the interval between hello packets that the switch sends on the interface, use the ip ospf hello-interval command in interface configuration mode. To return to the default time, use the no form of this command.

## Command Syntax

ip ospf hello-interval *SECONDS*

no ip ospf hello-interval

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SECONDS | Interval (in seconds) during which the router must receive at least one hello packet from a neighbor or else that neighbor is removed from the peer list and does not participate in routing. The range is 1 to 65535. The value must be the same for all nodes on the network | 1-65535 |

### Command Mode

Interface Configuration

### Default

10 seconds (Ethernet)

30 seconds (non-broadcast)

### Usage

This value is advertised in the hello packets. The smaller the hello interval, the faster topological changes will be detected, but more routing traffic will ensue. This value must be the same for all routers and access servers on a specific network.

### Examples

The following example sets the interval between hello packets to 15 seconds:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport
Switch(config-if)# ip ospf hello-interval 15
```

### Related Commands

ip ospf dead-interval

## 6.3.21 ip ospf message-digest-key md5

### Command Purpose

To enable Open Shortest Path First (OSPF) Message Digest 5 (MD5) authentication, use the ip ospf message-digest-key command in interface configuration mode. To remove an old MD5 key, use the no form of this command.

### Command Syntax

ip ospf message-digest-key *KEY-ID* md5 ( 8 | ) *KEY*

no ip ospf message-digest-key *KEY-ID*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| KEY-ID | An identifier in the range from 1 to 255 | 1-255 |
| (8\|) | Specifies a hidden password will follow | - |
| KEY | Alphanumeric password of up to 16 bytes | A string with 1-16 characters |

## Command Mode

Interface Configuration

## Default

OSPF MD5 authentication is disabled.

## Usage

All routers access the same network/sub network share the same password when using this type of authentication. For every OSPF packet, the password is used for generating/examining the "message digest" which is at the tail of the OSPF packet. This "message digest" is processed by OSPF packet and password. There may multiple password be activated on the same interface, this command line always used to transit smoothly to the new password from the old one.

## Examples

The following example sets a new key 19 with the password 8ry4222:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport
Switch(config-if)# ip ospf message-digest-key 10 md5 xvv560qle
Switch(config-if)# ip ospf message-digest-key 19 md5 8ry4222
```

The following example sets a new key 2 with the encrypt password 91c38996a1aa5699:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport
Switch(config-if)# ip ospf message-digest-key 2 md5 8 91c38996a1aa5699
```

### Related Commands

area authentication

service password-encryption

ip ospf authentication

## 6.3.22 ip ospf mtu

### Command Purpose

To set the MTU value when sending Database Descriptor (DD) packets, use the ip ospf mtu command in interface configuration mode. To restore a default value, use the no form of this command.

### Command Syntax

ip ospf mtu *MTU-VALUE*

no ip ospf mtu

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MTU-VALUE | MTU value | 576-65535 |

### Command Mode

Interface Configuration

### Default

Decided by interface mtu

### Usage

Whenever OSPF constructs packets, it uses interface MTU size as Maximum IP packet size. This command forces OSPF to use the specified value overriding the actual interface MTU size.

This command allows an administrator to configure the MTU size recognized by the OSPF protocol. It does not configure the MTU settings on the kernel. OSPF will not

recognize MTU size configuration changes made to the kernel until the MTU size is updated through the CLI.

### Examples

The following example sets a new MTU value when sending OSPF DD packets:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport
Switch(config-if)# ip ospf mtu 1280
```

### Related Commands

ip ospf mtu-ignore

## 6.3.23 ip ospf mtu-ignore

### Command Purpose

To disable Open Shortest Path First (OSPF) maximum transmission unit (MTU) mismatch detection on receiving Database Descriptor (DD) packets, use the ip ospf mtu-ignore command in interface configuration mode. To reset to default, use the no form of this command.

### Command Syntax

ip ospf mtu-ignore

no ip ospf mtu-ignore

### Command Mode

Interface Configuration

### Default

OSPF MTU mismatch detection is enabled.

### Usage

OSPF checks whether neighbors are using the same MTU on a common interface. This check is performed when neighbors exchange DD packets. If the receiving MTU in the DD packet is higher than the IP MTU configured on the incoming interface, OSPF adjacency will not be established.

### Examples

The following example disables MTU mismatch detection on receiving DD packets:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport
Switch(config-if)# ip ospf mtu-ignore
```

### Related Commands

ip ospf mtu

## 6.3.24 ip ospf priority

### Command Purpose

To set the router priority, which helps determine the designated router for this network, use the ip ospf priority command in interface configuration mode. To return to the default value, use the no form of this command.

### Command Syntax

ip ospf priority *NUMBER-VALUE*

no ip ospf priority

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NUMBER-VALUE | A number value that specifies the priority of the router. | 0-255 |

### Command Mode

Interface Configuration

## Default

Priority of 1

## Usage

When two routers attached to a network both attempt to become the designated router, the one with the higher router priority takes precedence. If there is a tie, the router with the higher router ID takes precedence. A router with a router priority set to zero is ineligible to become the designated router or backup designated router. Router priority is configured only for interfaces to multi-access networks (in other words, not to point-to-point networks).

This priority value is used when you configure Open Shortest Path First (OSPF) for non-broadcast networks using the neighbor router configuration command for OSPF.

## Examples

The following example sets the router priority value to 4:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport
Switch(config-if)# ip ospf priority 4
```

## Related Commands

ip ospf network

neighbor (OSPF)

# 6.3.25 ip ospf retransmit-interval

## Command Purpose

To specify the time between link-state advertisement (LSA) retransmissions for adjacencies belonging to the interface, use the ip ospf retransmit-interval command in interface configuration mode. To return to the default value, use the no form of this command.

## Command Syntax

ip ospf retransmit-interval *SECONDS*

no ip ospf retransmit-interval

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SECONDS | Time (in seconds) between retransmissions. The default is 5 seconds | 1-65535 seconds |

## Command Mode

Interface Configuration

## Default

5 seconds

## Usage

When a router sends an LSA to its neighbor, it keeps the LSA until it receives back the acknowledgment message. If the router receives no acknowledgment, it will resend the LSA. The setting of this parameter should be conservative, or needless retransmission will result. The value should be larger for serial lines and virtual links.

## Examples

The following example sets the retransmit interval value:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport
Switch(config-if)# ip ospf retransmit-interval 8
```

## Related Commands

None

# 6.3.26 ip ospf transmit-delay

## Command Purpose

To set the estimated time required to send a link-state update packet on the interface, use the ip ospf transmit-delay command in interface configuration mode. To return to the default value, use the no form of this command.

## Command Syntax

ip ospf transmit-delay *SECONDS*

no ip ospf transmit-delay

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SECONDS | Time (in seconds) of link state transmit delay. The default is 1 seconds | 1-65535 |

## Command Mode

Interface Configuration

## Default

1 second

## Usage

Link-state advertisements (LSAs) in the update packet must have their ages incremented by the amount specified in the seconds argument before transmission. The value assigned should take into account the transmission and propagation delays for the interface.

If the delay is not added before transmission over a link, the time in which the LSA propagates over the link is not considered. This setting has more significance on very low-speed links.

## Examples

The following example sets the retransmit delay value to 3 seconds:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport
Switch(config-if)# ip ospf transmit-delay 3
```

### Related Commands

None

## 6.3.27 ip ospf network

### Command Purpose

To configure the Open Shortest Path First (OSPF) network type to a type other than the default for a given medium, use the ip ospf network command in interface configuration mode. To return to the default value, use the no form of this command.

### Command Syntax

ip ospf network ( broadcast | non-broadcast | point-to-multipoint [ non-broadcast ] | point-to-point )

no ip ospf network

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| broadcast | Sets the network type to broadcast.(Such as Ethernet,FDDI) | - |
| non-broadcast | Sets the network type to non-broadcast multi-access (NBMA) | - |
| point-to-multipoint | Sets the network type to point-to-multipoint. | - |
| point-to-point | Sets the network type to point-to-point | - |

### Command Mode

Interface Configuration

## Default

Depends on the network type.

## Usage

Using this feature, you can configure broadcast networks as NBMA networks when, for example, routers in your network do not support multicast addressing. You can also configure non-broadcast multi-access networks as broadcast networks. This feature saves you from needing to configure neighbors.

Configuring NBMA networks as either broadcast or non-broadcast assumes that there are virtual circuits from every router to every router or fully meshed networks. However, there are other configurations where this assumption is not true. For example, a partially meshed network. In these cases, you can configure the OSPF network type as a point-to-multipoint network. Routing between two routers that are not directly connected will go through the router that has virtual circuits to both routers. You need not configure neighbors when using this feature.

If this command is issued on an interface that does not allow it, this command will be ignored.

OSPF has two features related to point-to-multipoint networks. One feature applies to broadcast networks; the other feature applies to non-broadcast networks:

On point-to-multipoint, broadcast networks, you can use the neighbor command, and you must specify a cost to that neighbor.

On point-to-multipoint, non-broadcast networks, you must use the neighbor command to identify neighbors. Assigning a cost to a neighbor is optional.

## Examples

The following example sets your OSPF network as a non-broadcast network:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport
Switch(config-if)# ip address 192.168.77.17/24
Switch(config-if)# ip ospf network non-bradcast
```

## Related Commands

Neighbor (OSPF)

# 6.3.28 neighbor (OSPF)

## Command Purpose

To configure Open Shortest Path First (OSPF) routers interconnecting to non-broadcast networks, use the neighbor command in router configuration mode. To remove a configuration, use the no form of this command.

## Command Syntax

neighbor *IP_ADDR* { priority *NUMBER* | poll-interval *SECONDS* }

neighbor *IP_ADDR* ( cost *COST* | )

no neighbor *IP_ADDR* { priority | poll-interval }

no neighbor *IP_ADDR* ( cost | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IP_ADDR | Interface IP address of the neighbor | IPv4 Address |
| priority NUMBER | (Optional) A number that indicates the router priority value of the non-broadcast neighbor associated with the IP address specified. The default is 0. This keyword does not apply to point-to-multipoint interfaces | 0-255 |
| poll-interval | | - |
| cost | | - |

## Command Mode

Router Configuration

## Default

No configuration is specified.

## Usage

One neighbor entry must be included in the switch configuration for each known non-broadcast network neighbor. The neighbor address must be the the primary address of the interface.

If a neighboring router has become inactive (hello packets have not been received for the Router Dead Interval period), it may still be necessary to send hello packets to the dead neighbor. These hello packets will be sent at a reduced rate called Poll Interval.

When the router first starts up, it sends only hello packets to those routers with nonzero priority, that is, routers that are eligible to become designated routers (DRs) and backup designated routers (BDRs). After the DR and BDR are selected, DR and BDR will then start sending hello packets to all neighbors in order to form adjacencies.

## Examples

The following example declares a router at address 192.168.3.4 on a non-broadcast network, with a priority of 1 and a poll interval of 180 seconds:

```
Switch# configure terminal
Switch(config)# router ospf
Switch(config-router)# neighbor 192.168.3.4 priority 1 poll-interval 180
```

## Related Commands

ip ospf priority

# 6.3.29 network area (OSPF)

## Command Purpose

To define the interfaces on which Open Shortest Path First (OSPF) runs and to define the area ID for those interfaces, use the network area command in router configuration mode. To disable OSPF routing for interfaces defined with the address wildcard-mask pair, use the no form of this command.

## Command Syntax

network { *IP_ADDR WILDCARD-MASK* | *IP-ADDRESS/PREFIX-LENGTH* } area *AREA-ID*

no network { *IP-ADDRESS WILDCARD-MASK* | *IP-ADDRESS/PREFIX-LENGTH* } area *AREA-ID*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IP_ADDR | Interface IP address of the neighbor | IPv4 Address |
| WILDCARD-MASK | IP-address-type mask that includes “don’t care” bits | IPv4 mask |
| PREFIX-LENGTH | Prefix length for the network | 1-32 |
| AREA-ID | Area that is to be associated with the OSPF address range. It can be specified as either a decimal value or as an IP address | IP address or number in the range of 0-4294967295 |

## Command Mode

Router Configuration

## Default

This command is disabled by default.

## Usage

The IP-ADDRESS and WILDCARD-MASK arguments together allow you to define one or multiple interfaces to be associated with a specific OSPF area using a single command.

## Examples

The following partial example initializes OSPF routing process 109, and defines four OSPF areas 10.9.50.0, 2, 3, and 0. Areas 10.9.50.0, 2, and 3 mask specific address ranges, and area 0 enables OSPF for all other networks:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport
```

```
Switch(config-if)# ip address 10.108.20.1/24
Switch(config)# router ospf 109
Switch(config-router)# network 10.108.20.0/24  area 10.9.50.0
Switch(config-router)# network 10.108.0.0/16  area 2
Switch(config-router)# network 10.109.10.0/24  area 3
Switch(config-router)# network 0.0.0.0/0 area 0
```

### Related Commands

router ospf

## 6.3.30 overflow database external

### Command Purpose

Use this command to configure the size of the external database and the time the router waits before its entries to exit the overflow state.

Use the no parameter with this command to revert to default.

### Command Syntax

overflow database external *MAXLSAS RECOVERTIME*

no overflow database external

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MAXLSAS | The maximum number of LSAs. Note that this value should be the same | 0-2147483647 |
| RECOVERTIME | The number of seconds the router waits before trying to exit the database | 0-65535 |

### Command Mode

Router Configuration

### Default

None.

## Usage

Use this command to limit the number of AS-external-LSAs a router can receive, once it is in the wait state. It takes the number of seconds specified as the RECOVERTIME to recover from this state.

## Examples

The following example shows setting the maximum number of LSAs and the time to recover from overflow state:

```
Switch# configure terminal
Switch(config)# router ospf 200
Switch(config-router)# network 10.108.0.0/16 area 0
Switch(config-router)# overflow database external 5 3
```

## Related Commands

router ospf

# 6.3.31 passive-interface (OSPF)

## Command Purpose

To disable sending routing updates for the Open Shortest Path First (OSPF) on an interface, use the passive-interface command in router configuration mode. To re-enable the sending of routing updates, use the no form of this command.

## Command Syntax

passive-interface *IFNAME*

no passive-interface *IFNAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | The interface name | Support physical/aggregation/loopback/tunnel/vlan interfaces |

## Command Mode

Router Configuration

## Default

Routing updates are sent on the interface.

## Usage

If you disable the sending of routing updates on an interface, the particular subnet will continue to be advertised to other interfaces, and updates from other switches on that interface continue to be received and processed.

## Examples

The following example sets the interface eth-0-1 as passive:

```
Switch# configure terminal
Switch(config)# router ospf 200
Switch(config-router)# network 10.108.0.0/16 area 0
Switch(config-router)# passive-interface eth-0-1
```

## Related Commands

router ospf

# 6.3.32 redistribute (OSPF)

## Command Purpose

To redistribute routes from one routing domain into Open Shortest Path First (OSPF) routing domain, use the redistribute command in router configuration mode. To disable redistribution, use the no form of this command.

## Command Syntax

redistribute *PROTOCOL* [ route-map *WORD* ] [ tag *TAG-VALUE* ] [ metric *METRIC-VALUE* ] [ metric-type *TYPE-VALUE* ]

no redistribute *PROTOCOL* [ metric *METRIC -VALUE* ] [ metric-type *TYPE-VALUE* ]

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| route-map WORD | Route map reference. | A string with 1-20 characters |

| | | |
|---|---|---|
| PROTOCOL | (Optional) The name of a routing protocol, or the keyword connected, or static. If you specify a routing protocol | use one of the following keywords: static , connected, bgp, and rip |
| tag TAG-VALUE | Set tag for routes redistributed into OSPF | 0-4294967295 |
| metric METRIC-VALUE | (Optional) When redistributing other processes to an OSPF process, the default metric is 20 when no metric value is specified | 0-16777214 |
| metric-type TYPE-VALUE | For OSPF, the external link type associated with the default route advertised into the OSPF routing domain. It can be one of two values | 1-2 |

## Command Mode

Router Configuration

## Default

Route redistribution is disabled.

metric metric-value: 20

metric-type TYPE-VALUE: Type 2 external route

## Usage

The metric value specified in the redistribute command supersedes the metric value specified using the default-metric command.

## Examples

The following example redistribute the static routes into OSPF with metric 10:

```
Switch# configure terminal
Switch(config)# router ospf 119
Switch(config-router)# network 10.108.0.0/16 area 100
Switch(config-router)# redistribute static metric 10
```

### Related Commands

default-metric

## 6.3.33 router-id (OSPF)

### Command Purpose

To use a fixed router ID, use the router-id command in router configuration mode. To force Open Shortest Path First (OSPF) to use the previous OSPF router ID behavior, use the no form of this command.

### Command Syntax

router-id *IP_ADDR*

no router-id

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IP_ADDR | Router ID in IP address format | IPv4 Address |

### Command Mode

Router Configuration

### Default

No OSPF routing process is defined.

### Usage

You can configure an arbitrary value in the IP address format for each router. However, each router ID must be unique.

If this command is used on an OSPF router process which is already active (has neighbors), the new router-ID is used at the next reload or at a manual OSPF process restart. To manually restart the OSPF process, use the clear ip ospf command.

## Examples

The following example specifies a fixed router-id:

```
Switch# configure terminal
Switch(config)# router ospf 119
Switch(config-router)# router-id 10.1.1.1
```

## Related Commands

clear ip ospf

router ospf

# 6.3.34 router ospf

## Command Purpose

To configure an Open Shortest Path First (OSPF) routing process, use the router ospf command in global configuration mode. To terminate an OSPF routing process, use the no form of this command.

## Command Syntax

router ospf [ *PROCESS-ID* [ vrf *VPN-NAME* ] ]

no router ospf [ *PROCESS-ID* ]

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PROCESS-ID | Internally used identification parameter for an OSPF routing process.If you don't assign a PROCESS-ID, it enter process ID 0. Process ID 0 will be closed if you use the no form of this command and don't assign PORCESS-ID. | 1-65535 |
| vrf VPN-NAME | (Optional) Specifies the name of the VPN routing and forwarding (VRF) instance to associate with OSPF VRF processes | A string with 1-31 characters |

## Command Mode

Global Configuration

## Default

No OSPF routing process is defined.

## Usage

You can specify multiple OSPF routing processes in each router. If you do not specify the process-id, the process-id will be the default 0.

## Examples

The following example configures an OSPF routing process and assign a process number of 109:

```
Switch# configure terminal
Switch(config)# router ospf 109
Switch(config-router)#
```

## Related Commands

network area

# 6.3.35 summary-address (OSPF)

## Command Purpose

To create aggregate addresses for Open Shortest Path First (OSPF), use the summary-address command in router configuration mode. To restore the default, use the no form of this command.

## Command Syntax

summary-address *PREFIX/PREFIX-LENGTH* ( not-advertise | tag *TAG-VALUE* | )

no summary-address *PREFIX/PREFIX-LENGTH* ( not-advertise | tag *TAG-VALUE* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PREFIX | IP route prefix for the destination | IPv4 Address |
| PREFIX-LENGTH | Prefix length for the network | 1-32 |
| not-advertise | (Optional) Suppress routes that match the specified prefix/mask pair. This keyword applies to OSPF only | - |
| tag TAG-VALUE | Route tag value. The default tag is 0. | 0-4294967295 |

## Command Mode

Router Configuration

## Default

This command is disabled by default.

## Usage

Routes learned from other routing protocols can be summarized. The metric used to advertise the summary is the largest metric of all the more specific routes. This command helps reduce the size of the routing table.

Using this command for OSPF causes an OSPF Autonomous System Boundary Router (ASBR) to advertise one external route as an aggregate for all redistributed routes that are covered by the address. For OSPF, this command summarizes only routes from other routing protocols that are being redistributed into OSPF. Use the area range command for route summarization between OSPF areas.

OSPF does not support the summary-address 0.0.0.0/0 command.

## Examples

In the following example, the summary address 10.1.0.0 includes address 10.1.1.0, 10.1.2.0, 10.1.3.0, and so on. Only the address 10.1.0.0 is advertised in an external link-state advertisement:

```
Switch# configure terminal
Switch(config)# router ospf
Switch(config-router)# summary-address 10.1.0.0/16
```

### Related Commands

area range

## 6.3.36 show ip ospf

### Command Purpose

To display general information about Open Shortest Path First (OSPF) routing processes, use the show ip ospf command in user EXEC or privileged EXEC mode.

### Command Syntax

show ip ospf ( *PROCESS-ID* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PROCESS-ID | Internally used identification parameter for an OSPF routing process. It is locally assigned and can be any positive integer. A unique value is assigned for each OSPF routing process | 0-65535 |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

## Examples

The following is sample output from the show ip ospf command:

```
Switch# show ip ospf
 Routing Process "ospf 100" with ID 11.11.11.11
 Process uptime is 0 minute
 Process bound to VRF default
 Conforms to RFC2328, and RFC1583 Compatibility flag is disabled
 Supports only single TOS(TOS0) routes
 Supports opaque LSA
 SPF schedule delay 5 secs, Hold time between two SPFs 10 secs
 Refresh timer 10 secs
 Number of incomming current DD exchange neighbors 0/5
 Number of outgoing current DD exchange neighbors 0/5
 Number of external LSA 0. Checksum 0x000000
 Number of opaque AS LSA 0. Checksum 0x000000
 Number of non-default external LSA 0
 External LSA database is unlimited.
 Number of LSA originated 1
 Number of LSA received 3
 Number of areas attached to this router: 1
    Area 1
        Number of interfaces in this area is 1(1)
        Number of fully adjacent neighbors in this area is 1
        Number of fully adjacent virtual neighbors through this area is 0
        Area has no authentication
        SPF algorithm last executed 00:00:38.995 ago
        SPF algorithm executed 1 times
        Number of LSA 4. Checksum 0x0235ff
```

## Related Commands

None

# 6.3.37 show ip ospf border-routers

## Command Purpose

To display the internal Open Shortest Path First (OSPF) routing table entries to an Area Border Router (ABR) and Autonomous System Boundary Router (ASBR), use the show ip ospf border-routers command in privileged EXEC mode.

## Command Syntax

show ip ospf border-routers

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following is sample output from the show ip ospf border-routers command:

```
Switch# show ip ospf border-routers
OSPF process 100 internal Routing Table
Codes: i - Intra-area route, I - Inter-area route
i 22.22.22.22 [1] via 172.10.1.2, eth-0-10, ABR, Area 1
```

### Related Commands

None

## 6.3.38 show ip ospf database

### Command Purpose

To display lists of information related to the Open Shortest Path First (OSPF) database for a specific router, use the show ip ospf database command in EXEC mode.

### Command Syntax

show ip ospf ( *PROCESS-ID* | ) database database-summary

show ip ospf ( *PROCESS-ID* | ) database ( self-originate | max-age | adv-router *IP_ADDR* | )

show ip ospf ( *PROCESS-ID* | ) database ( asbr-summary | external | network | router | summary | nssa-external | opaque-link | opaque-area | opaque-as ) ( self-originate | adv-router *IP_ADDR* | )

show ip ospf ( *PROCESS-ID* | ) database ( asbr-summary | external | network | router | summary | nssa-external | opaque-link | opaque-area | opaque-as ) *LINK-STATE-ID* ( self-originate | adv-router *A.B.C.D* | ) ]

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PROCESS-ID | Internally used identification parameter for an OSPF routing process. It is locally assigned and can be any positive integer. A unique value is assigned for each OSPF routing process | 1-65535 |
| adv-router IP_ADDR | (Optional) Displays all the LSAs of the specified router. If no IP address is included, the information is about the local router itself (in this case, the same as self-originate) | IPv4 Address |
| LINK-STATE-ID | (Optional) Portion of the Internet environment that is being described by the advertisement. The value entered depends on the advertisement's LS type. It must be entered in the form of an IP address | IPv4 Address |
| asbr-summary | (Optional)Displays information only about the autonomous system boundary router summary LSAs | - |
| external | (Optional) Displays information only about the external LSAs | - |
| network | (Optional) Displays information only about the network LSAs | - |
| router | (Optional) Displays information only about the router LSAs | - |
| self-originate | (Optional) Displays only self-originated LSAs from the local router | - |

| | | |
|---|---|---|
| summary | (Optional) Displays information only about the summary LSAs | - |
| nssa-external | (Optional) Displays information only about the nssa-external LSAs | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following is sample output from the show ip ospf database command when no arguments or keywords are used:

```
Switch# show ip ospf database
                Router Link States (Area 3 [Stub])
Link ID         ADV Router      Age  Seq#       CkSum  Link count
10.0.0.1        10.0.0.1         546 0x80000089 0x4567 1
```

## Related Commands

None

# 6.3.39 show ip ospf interface

## Command Purpose

To display Open Shortest Path First (OSPF)-related interface information, use the show ip ospf interface command in EXEC mode.

## Command Syntax

show ip ospf interface ( *IFNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | (Optional) Interface name. If the interface-name argument is included, only information for the specified interface is included | Support physical/aggregation/loopback/tunnel/vlan interfaces |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following is sample output of the show ip ospf interface command when eth-0-3 is specified:

```
Switch# show ip ospf interface eth-0-3
eth-0-3 is up, line protocol is up
  Internet Address 3.3.3.1/24, Area 3 [Stub], MTU 1500
  Process ID 0, Router ID 10.0.0.1, Network Type NBMA, Cost: 1
  Transmit Delay is 1 sec, State DR, Priority 1
  Designated Router (ID) 10.0.0.1, Interface Address 3.3.3.1
  No backup designated router on this network
  Timer intervals configured, Hello 30, Dead 120, Wait 120, Retransmit 5
    Hello due in 00:00:17
  Neighbor Count is 1, Adjacent neighbor count is 0
  Crypt Sequence Number is 1218176990
  Hello received 0 sent 80, DD received 0 sent 0
  LS-Req received 0 sent 0, LS-Upd received 0 sent 0
  LS-Ack received 0 sent 0, Discarded 0
```

### Related Commands

None

## 6.3.40 show ip ospf neighbor

### Command Purpose

To display Open Shortest Path First (OSPF)-neighbor information on a per-interface basis, use the show ip ospf neighbor command in privileged EXEC mode.

### Command Syntax

show ip ospf neighbor [ *IFNAME* ] [ *NEIGHBOR-ID* ] [ detail ] [ all ]

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | (Optional) Interface name. If the interface-name argument is included, only information for the specified interface is included | - |
| NEIGHBOR-ID | (Optional) Neighbor ID | - |
| detail | (Optional) Displays all neighbors given in detail (lists all neighbors) | - |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following is sample output from the show ip ospf neighbor command showing a single line of summary information for each neighbor:

```
Switch# show ip ospf neighbor
Neighbor ID     Pri State          Dead Time Address          Interface
10.199.199.137    1 FULL/DR        0:00:31   192.168.80.37   eth-0-1
172.16.48.1        1 FULL/DROTHER 0:00:33   172.16.48.1     vlan1
172.16.48.200      1 FULL/DROTHER 0:00:33   172.16.48.200  vlan2
10.199.199.137     5 FULL/DR        0:00:33   172.16.48.189  eth-0-2
```

### Related Commands

None

## 6.3.41 show ip ospf summary-address

### Command Purpose

To display the summary addresses redistribution Information used by OSPF, use the show ip ospf summary-address command in privileged EXEC mode.

### Command Syntax

show ip ospf summary-address

### Command Mode

Privileged EXEC

### Default

None

### Usage

Metric equals to 16777215 means not advertise.

### Examples

The following example shows how to use show ip ospf summary-address command:

```
Switch# show ip ospf summary-address
OSPF process 0:
10.0.0.0/8 Metric 20, Type 2, Tag 0
20.0.0.0/8 Metric 16777215, Type 0, Tag 0
```

### Related Commands

None

## 6.3.42 show ip ospf route summary

### Command Purpose

To display the summary of routes used by OSPF, use the show ip ospf route summary command in privileged EXEC mode.

### Command Syntax

show ip ospf ( *PROCESS-ID* | ) route summary

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PROCESS-ID | (Optional) Internal identification. It is locally assigned and can be any positive integer. The number used here is the number assigned administratively when enabling the OSPF routing process | 0-65535 |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

## Examples

The following example shows how to use show ip ospf route summary command:

```
Switch# show ip ospf route summary
            OSPF Router with ID (10.10.10.10) (Process ID 0)
  Route Type                        Count
  (C)Connected                        1
  (D)Discard                          1
  (O)Intra area                       0
  (IA)Inter area                      0
  (E1)Ext type 1                      0
  (E2)Ext type 2                      0
  (N1)NSSA Ext type 1                 0
  (N2)NSSA Ext type 2                 0
  Total                               2
```

## Related Commands

None

# 6.3.43 show ip protocols ospf

## Command Purpose

To display IP routing protocol process parameters and statistics of Open Shortest Path First (OSPF).use the show ip ospf protocols ospf command in privileged EXEC mode.

## Command Syntax

show ip protocols ospf ( vrf *WORD* )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| vrf | VPN Routing/Forwarding instance | - |
| WORD | VPN Routing/Forwarding instance name | A string with 1-31 characters |

## Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following example shows how to use show ip protocols ospf command:

```
Switch# show ip protocols ospf
Routing Protocol is "ospf 0"
  Redistributing:
  Routing for Networks:
  Distance: (default is 110)
```

### Related Commands

None

## 6.3.44 show ip ospf processes-count

### Command Purpose

To display the current number and max number of router ospf processes.use the show ip ospf protocols ospf command in privileged EXEC mode.

### Command Syntax

show ip ospf processes-count

### Command Mode

Privileged EXEC

### Default

None

## Usage

None

## Examples

The following example shows how to use show ip ospf process count:

```
DUT1# show ip ospf processes-count

 OSPF processes current count 0
 OSPF processes max count     200
```

## Related Commands

None

# 6.3.45 timers spf

## Command Purpose

To set the time of Open Shortest Path First (OSPF) calculating shortest path first (SPF). To restore the default, use the no form of this command.

## Command Syntax

timers spf *SPF-START SPF-HOLD*

no timers spf

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SPF-START | Indicates the initial SPF schedule delay in seconds. | 0-2147483647 |
| SPF-HOLD | Indicates the minimum hold time between two consecutive SPF calculations. | 0-2147483647 |

## Command Mode

Router Configuration

## Default

spf-start: 5 seconds

spf-hold: 10 seconds.

## Usage

None

## Examples

The following example shows a router configured with the start, and hold values for the timers spf command set at 5, and 10 seconds, respectively:

```
Switch# configure terminal
Switch(config)# router ospf 1
Switch(config-router)# router-id 10.10.10.2
Switch(config-router)#timers spf 5 10
Switch(config-router)# redistribute static
Switch(config-router)# network 10.21.21.0/24 area 0
Switch(config-router)# network 10.22.22.0/24 area 00
```

## Related Commands

None

# 6.3.46 max-concurrent-dd

## Command Purpose

To specify Maximum number allowed to process DD concurrently, use the max-concurrent-dd command in router configuration mode. To restore default value, use the no form of this command

## Command Syntax

max-concurrent-dd *NUMBER-VALUE*

no max-concurrent-dd

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NUMBER-VALUE | Number of DD process | 1-65535 |

### Command Mode

Router Configuration

### Default

5

### Usage

None

### Examples

The following example shows how to use max-concurrent-dd command:

```
Switch# configure terminal
Switch(config)# router ospf 100
Switch(config-router)# router-id 10.10.10.2
Switch(config-router)# max-concurrent-dd 10
```

### Related Commands

None

## 6.3.47 maximum-area

### Command Purpose

To specify Maximum number of ospf area, use the maximum-area command in router configuration mode. To restore default value, use the no form of this command

### Command Syntax

maximum-area *NUMBER-VALUE*

no maximum-area

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NUMBER-VALUE | Number o f max-area | 1-4294967294 |

### Command Mode

Router Configuration

### Default

3000

### Usage

This command used to specify Maximum number of ospf area.

### Examples

The following example shows how to use maximum-area command:

```
Switch# configure terminal
Switch(config)# router ospf 100
Switch(config-router)# router-id 10.10.10.2
Switch(config-router)# maximum-area 100
```

### Related Commands

None

## 6.3.48 refresh timer

### Command Purpose

To Set refresh timer of link state database, use the refresh timer command in router configuration mode. To restore default value, use the no form of this command

### Command Syntax

refresh timer *NUMBER-VALUE*

no refresh timer

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NUMBER-VALUE | Number of DD process | 10-1800 |

### Command Mode

Router Configuration

### Default

10 seconds.

### Usage

Users are not advised to modify the configuration

### Examples

The following example shows how to use refresh timer command:

```
Switch# configure terminal
Switch(config)# router ospf 100
Switch(config-router)# router-id 10.10.10.2
Switch(config-router)# refresh timer 100
```

### Related Commands

None

## 6.3.49 ip ospf bfd

### Command Purpose

Use this command to enable IP BFD for ospf on an interface.

Use the “no” form of this command to disable IP BFD for ospf on an interface.

### Command Syntax

ip ospf bfd

no ip ospf bfd

### Command Mode

Interface Configuration

## Default

By default IP BFD for ospf is disabled on the interface.

## Usage

Use this command to enable IP BFD for ospf on an interface.

The IP BFD session should be created when ospf neighbor is created and the neighbor's state is large than "two-way".

The IP BFD session should be destroyed when ospf neighbor is delete or the neighbor's state is not large than "two-way".

## Examples

In the following example, IP BFD for ospf is enabled on this interface:

```
Switch# configure terminal
Switch(config-if)# ip ospf bfd
```

## Related Commands

None

# 6.3.50 debug ospf

## Command Purpose

Use this command to specify all debugging options for OSPF. Use the no parameter with this command to disable this function.

## Command Syntax

debug ospf ( all | )

no debug ospf ( all | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| all | enable all debugging | - |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

```
Switch# debug ospf all
```

### Related Commands

None

## 6.3.51 debug ospf bfd

### Command Purpose

Use this command to specify debugging options for OSPF bfd. Use the no parameter with this command to disable this function.

### Command Syntax

debug ospf bfd

no debug ospf bfd

### Command Mode

Privileged EXEC

### Default

None

## Usage

None

## Examples

```
Switch# debug ospf bfd
```

## Related Commands

None

# 6.3.52 debug ospf events

## Command Purpose

Use this command to specify debugging options for OSPF event troubleshooting. Use this command without parameters to turn on all the options. Use the no parameter with this command to disable this function.

## Command Syntax

debug ospf events ( abr | asbr | lsa | os | router | vlink | )

no debug ospf events ( abr | asbr | lsa | os | router | vlink | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| abr | Displays ABR events | - |
| asbr | Displays ASBR events | - |
| lsa | Displays LSA events | - |
| os | Displays OS interaction events | - |
| router | Displays others router events | - |
| vlink | Displays virtual link events | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

```
Switch# debug ospf events lsa
```

## Related Commands

None

# 6.3.53 debug ospf ifsm

## Command Purpose

Use this command to specify debugging options for OSPF Interface Finite State Machine (IFSM) troubleshooting.

Use the no parameter with this command to disable this function.

## Command Syntax

debug ospf ifsm ( status | events | timers | )

no debug ospf ifsm ( status | events | timers | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| status | Displays IFSM status information | - |
| events | Displays IFSM event information | - |
| timers | Displays IFSM TIMER information | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

```
Switch# debug ospf ifsm timers
```

## Related Commands

None

# 6.3.54 debug ospf nfsm

## Command Purpose

Use this command to specify debugging options for OSPF Neighbor Finite State Machine (NFSM) troubleshooting.

Use the no parameter with this command to disable this function.

## Command Syntax

debug ospf nfsm ( status | events | timers | )

no debug ospf nfsm ( status | events | timers | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| status | Displays NFSM status information | - |
| events | Displays NFSM event information | - |
| timers | Displays NFSM TIMER information | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

```
Switch# debug ospf nfsm timers
```

## Related Commands

None

# 6.3.55 debug ospf lsa

## Command Purpose

Use this command to specify debugging options for OSPF Link State Advertisements (LSA) troubleshooting.

Use the no parameter with this command to disable this function.

## Command Syntax

debug ospf lsa ( flooding | generate | install | maxage | refresh | )

no debug ospf lsa ( flooding | generate | install | maxage | refresh | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| flooding | Displays LSA flooding | - |
| generate | Displays LSA generate | - |
| install | Displays LSA installation | - |
| maxage | Displays the maximum age of LSA in seconds | - |
| refresh | Displays LSA refresh | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

```
Switch# debug ospf lsa install
```

## Related Commands

None

# 6.3.56 debug ospf packet

## Command Purpose

Use this command to specify debugging options for OSPF packets.

Use the no parameter with this command to disable this function..

## Command Syntax

debug ospf packet *PARAMETERS*

no debug ospf packet *PARAMETERS*

*PARAMETERS* = dd | detail | hello | ls-ack | ls-request | ls-update | recv | send

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| dd | Specifies debugging for OSPF database descriptions | - |
| detail | Sets the debug option to detailed information | - |
| hello | Specifies debugging for OSPF hello packets | - |
| ls-ack | Specifies debugging for OSPF link state acknowledgments | - |

| | | |
|---|---|---|
| ls-request | Specifies debugging for OSPF link state requests | - |
| ls-update | Specifies debugging for OSPF link state updates | - |
| recv | Specifies the debug option set for received packets | - |
| send | Specifies the debug option set for sent packets | - |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

```
Switch# debug ospf packet dd send detail
```

### Related Commands

None

## 6.3.57 debug ospf route

### Command Purpose

Use this command to specify which route calculation to debug. Use this command without parameters to turn on all the options.

Use the no parameter with this command to disable this function.

### Command Syntax

debug ospf route ( ase | ia | install | spf | )

no debug ospf route ( ase | ia | install | spf | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ase | Specifies the debugging of external route calculation | - |
| ia | Specifies the debugging of Inter-Area route calculation | - |
| install | Specifies the debugging of route installation | - |
| spf | Specifies the debugging of SPF calculation | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

```
Switch# debug ospf route install
```

## Related Commands

None

# 6.3.58 show debugging ospf

## Command Purpose

Use this command to display the set OSPF debugging option..

## Command Syntax

show debugging ospf

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This is a sample output from the show debugging ospf command:

```
Switch# show debugging ospf
OSPF debugging status:
  OSPF packet Hello send debugging is on
  OSPF packet Database Description send debugging is on
  OSPF packet Link State Request send debugging is on
  OSPF packet Link State Update send debugging is on
  OSPF packet Link State Acknowledgment send debugging is on
  OSPF route installation debugging is on
```

### Related Commands

None

## 6.3.59 show resource ospf

### Command Purpose

Use this command to display the route resources used by OSPF protocol.

### Command Syntax

show resource ospf

### Command Mode

Privileged EXEC

## Default

None

## Usage

If you do not use OSPF, value of capability is 0.

## Examples

The following is sample output from the show resource ospf command:

```
Switch# show resource ospf
OSPF
Resource                 Used          Capability
================================================
Routes                   1              6144
```

## Related Commands

show ip ospf route summary

# 6.3.60 min-lsa-interval

## Command Purpose

Configure the

minimum interval between the same LSAs

## Command Syntax

min-lsa-interval *SECONDS*

no min-lsa-interval

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SECONDS | The minimum interval between the same LSAs | 0-10 |

## Command Mode

Router Configuration

### Default

The default interval is 5

### Usage

Only if you use OSPF,

you can configure the value range from 0 to 10 second

### Examples

The following is a sample to configure the MinLSInteval:

```
Switch# configure terminal
Switch(config)# router ospf
Switch(config-router)# min-lsa-interval 3
```

### Related Commands

None

## 6.4 Route Map Commands

### 6.4.1 route-map

### Command Purpose

To define the conditions for redistributing routes from one routing protocol into another, or to enable policy routing in bgp, use the route-map command in global configuration mode and the match and set command in route-map configuration modes. To delete an entry, use the no form of this command.

### Command Syntax

route-map *MAP_TAG* ( deny | permit | ) ( *SEQUENCE-NUMBER* | )

no route-map *MAP_TAG* ( deny | permit | ) ( *SEQUENCE-NUMBER* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MAP_TAG | A meaningful name for the route map. The redistribute router configuration command uses this name to reference this route map. Multiple route maps may share the same map tag name. The length of route-map name should not greater than 20 and the first character should be 'a'-'z', 'A'-'Z' or '0'-'9' | - |
| permit | (Optional) If the match criteria are met for this route map, and the permit keyword is specified, the route is redistributed as controlled by the set actions.<br>(Optional) If the match criteria are met for this route map, and the permit keyword is specified, the route is redistributed as controlled by the set actions.<br>If the match criteria are not met, and the permit keyword is specified, the next route map with the same map tag is tested. If a route passes none of the match criteria for the set of route maps sharing the same name, it is not redistributed by that set. | - |
| deny | (Optional) If the match criteria are met for the route map and the deny keyword is specified, the route is not redistributed | - |

| | | |
|---|---|---|
| SEQUENCE-NUMBER | (Optional) Number that indicates the position a new route map will have in the list of route maps already configured with the same name. If given with the no form of this command, the position of the route map should be deleted | 1-65535 |

## Command Mode

Global Configuration

## Default

The permit keyword is the default.

## Usage

None

## Examples

The following example shows how to create a route-map and enter route-map configuration mode:

```
Switch# configure terminal
Switch(config)# route-map rip-to-ospf permit
Switch(config-route-map)# match metric 1
Switch(config-route-map)# set metric 2
```

## Related Commands

match as-path

match community

match interface

match ip address

match local-preference

match metric

match origin

match route-type

match tag

set aggregator

set as-path

set atomic-aggregate

set comm-list

set community

set dampening

set extcommunity

set ip address

set local-preference

set metric

set metric-type

set origin

set originator-id

set tag

set vpnv4

set weight

## 6.4.2 match as-path

### Command Purpose

Use this command to match an autonomous system path access list.

Use the no parameter with this command to remove a path list entry.

The match as-path command specifies the autonomous system path to be matched. If there is a match for the specified AS path, and permit is specified, the route is

redistributed or controlled, as specified by the set action. If the match criteria are met, and deny is specified, the route is not redistributed or controlled. If the match criteria are not met then the route is neither accepted nor forwarded, irrespective of permit or deny specifications.

The route specified by the policies might not be the same as specified by the routing protocols. Setting policies enable packets to take different routes, depending on their length or content. Packet forwarding based on configured policies overrides packet forwarding specified in routing tables.

## Command Syntax

match as-path *LISTNAME*

no match as-path

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LISTNAME | Specifies as autonomous system path access list name | Up to 40 characters |

## Command Mode

Route-map Configuration

## Default

No match as-path is specified by default.

## Usage

This command is valid only for BGP.

## Examples

```
Switch# configure terminal
Switch(config)# route-map myroute deny 34
Switch(config-route-map)# match as-path myaccesslist
```

## Related Commands

match metric

match ip address

match community

set as-path

set community

## 6.4.3 match community

### Command Purpose

Use this command to specify the community to be matched.

Use the no parameter with this command to remove the community list entry.

Communities are used to group and filter routes. They are designed to provide the ability to apply policies to large numbers of routes by using match and set commands. Community lists are used to identify and filter routes by their common attributes.

Use the match community command to allow matching based on community lists.

The values set by the match community command overrides the global values. The route that does not match at least one match clause is ignored.

### Command Syntax

match community *WORD*

no match community

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| WORD | Specifies the Community-list name | Up to 20 characters |

### Command Mode

Route-map Configuration

### Default

No match community is specified by default.

### Usage

This command is valid only for BGP.

### Examples

```
Switch# configure terminal
Switch(config)# route-map myroute permit 3
Switch(config-route-map)# match community mylist
```

### Related Commands

match ip address

match as-path

set as-path

set community

match metric

## 6.4.4 match interface

### Command Purpose

Use this command to define the interface match criterion.

Use the no parameter with this command to remove the specified match criterion..

The match interface command specifies the next-hop interface name of a route to be matched.

### Command Syntax

match interface *IFNAME*

no match interface

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | A string that specifies the interface for matching | Support physical/aggregation/loopback/tunnel/vlan interfaces |

### Command Mode

Route-map Configuration

### Default

No match interface is specified by default.

### Usage

This command is valid only for OSPF.

### Examples

```
Switch# configure terminal
Switch(config)# route-map mymap1 permit 10
Switch(config-route-map)# match interface eth-0-1
```

### Related Commands

match tag

match route-type external

## 6.4.5 match ip address

### Command Purpose

Use this command to specify the match address of route.

Use the no parameter with this command to remove the match ip address entry.

The match ip address command specifies the IP address to be matched. If there is a match for the specified IP address, and permit is specified, the route is redistributed or controlled, as specified by the set action. If the match criteria are met, and deny is specified then the route is not redistributed or controlled. If the match criteria are not met, the route is neither accepted nor forwarded, irrespective of permit or deny specifications.

The route specified by the policies might not be the same as specified by the routing protocols. Setting policies enable packets to take different routes,

depending on their length or content. Packet forwarding based on configured policies overrides packet forwarding specified in routing tables.

## Command Syntax

match ip address *ACCESSSLISTID*

no match ip address

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ACCESSSLISTID | Specify a IPv4 access-list name, up to 20 characters | - |

## Command Mode

Route-map Configuration

## Default

No match ip address is specified by default.

## Usage

This command is valid for BGP, OSPF and RIP only.

## Examples

```
Switch# configure terminal
Switch(config)# route-map myroute permit 3
Switch(config-route-map)# match ip address List1
```

## Related Commands

match community

match as-path

set as-path

set community

match metric

# 6.4.6 match ip address prefix-list

## Command Purpose

Use this command to match entries of prefix-lists.

Use the no parameter with this command to disable this function

This command specifies the entries of prefix-lists to be matched. If there is a match for the specified prefix-list entries, and permit is specified, the route is redistributed or controlled, as specified by the set action. If the match criteria are met, and deny is specified, the route is not redistributed or controlled. If the match criteria are not met, the route is neither accepted nor forwarded, irrespective of permit or deny specifications.

The route specified by the policies might not be the same as specified by the routing protocols. Setting policies enable packets to take different routes depending on their length or content. Packet forwarding based on configured policies overrides packet forwarding specified in routing tables.

## Command Syntax

match ip address prefix-list *LISTNAME*

no match ip address prefix-list [ *LISTNAME* ]

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LISTNAME | Specifies the IP prefix list name | Up to 40 characters |

## Command Mode

Route-map Configuration

## Default

No match ip address prefix-list is specified by default.

## Usage

This command is valid for BGP, OSPF and RIP only.

### Examples

```
Switch# configure terminal
Switch(config)# route-map rmap1 permit 3
Switch(config-route-map)# match ip address prefix-list mylist
```

### Related Commands

match community

match as-path

set as-path

set community

match metric

## 6.4.7 match ip next-hop

### Command Purpose

Use this command to specify a next-hop address to be matched in a route-map.

Use the no parameter with this command to disable this function.

The match ip next-hop command specifies the next-hop address to be matched. If there is a match for the specified next-hop address, and permit is specified, the route is redistributed or controlled as specified by the set action. If the match criteria are met, and deny is specified, the route is not redistributed or controlled. If the match criteria are not met, the route is neither accepted nor forwarded, irrespective of permit or deny specifications.

The route specified by the policies might not be the same as specified by the routing protocols. Setting policies enable packets to take different routes depending on their length or content. Packet forwarding based on configured policies overrides packet forwarding specified in routing tables.

### Command Syntax

match ip next-hop *ACCESSSLISTID*

no match ip next-hop [ *ACCESSSLISTID* ]

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| ACCESSSLISTID | Specify a IPv4 access-list name, up to 20 characters | Up to 40 characters |

## Command Mode

Route-map Configuration

## Default

No match ip next-hop is specified by default.

## Usage

This command is valid for BGP, OSPF and RIP only.

## Examples

```
Switch# configure terminal
Switch(config)# route-map rmap1 permit 3
Switch(config-route-map)# match ip next-hop mylist
```

## Related Commands

match community

match as-path

set as-path

set community

match metric

# 6.4.8 match ip next-hop prefix-list

## Command Purpose

Use this command to specify the next-hop IP address match criterion, using the prefix-list.

Use the no parameter with this command to remove the specified match criterion.

## Command Syntax

match ip next-hop prefix-list *LISTNAME*

no match ip next-hop prefix-list [ *LISTNAME* ]

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LISTNAME | A string specifying the prefix-list name | - |

## Command Mode

Route-map Configuration

## Default

No match ip next-hop prefix-list is specified by default.

## Usage

This command is valid for BGP, OSPF and RIP only.

## Examples

```
Switch# configure terminal
Switch(config)# route-map mymap permit 3
Switch(config-route-map)# match ip next-hop prefix-list list1
```

## Related Commands

match metric

match interface

match ip next-hop

# 6.4.9 match local-preference

## Command Purpose

Use this command to specify the local-preference match criterion.

Use the no parameter with this command to remove the specified match criterion.

Use the match local-preference command to match the local preference of a route.

## Command Syntax

match local-preference *LOCAL-PREFERENCE*

no match local-preference

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LOCAL-PREFERENCE | Species the preference value | 0-4294967295 |

## Command Mode

Route-map Configuration

## Default

No match local-preference is specified by default.

## Usage

This command is valid for BGP only.

## Examples

```
Switch# configure terminal
Switch(config)# route-map mymap permit 3
Switch(config-route-map)# match local-preference 100
```

## Related Commands

match community

match as-path

set as-path

set community

match ip next-hop

# 6.4.10 match metric

## Command Purpose

Use this command to match a metric of a route.

Use the no parameter with this command to disable this function.

The match metric command specifies the metric to be matched. If there is a match for the specified metric, and permit is specified, the route is redistributed or controlled as specified by the set action. If the match criteria are met, and deny is specified, the route is not redistributed or controlled. If the match criteria are not met, the route is neither accepted nor forwarded, irrespective of permit or deny specifications.

The route specified by the policies might not be the same as specified by the routing protocols. Setting policies enable packets to take different routes depending on their length or content. Packet forwarding based on configured policies overrides packet forwarding specified in routing tables.

## Command Syntax

match metric *METRICVAL*

no match metric

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| METRICVAL | The metric value | 0-4294967295 |

## Command Mode

Route-map Configuration

## Default

No match metric is specified by default.

## Usage

This command is valid for BGP, OSPF and RIP only.

### Examples

```
Switch# configure terminal
Switch(config)# route-map myroute permit 3
Switch(config-route-map)# match metric 2
```

### Related Commands

match community

match as-path

set as-path

set community

match ip next-hop

## 6.4.11 match origin

### Command Purpose

Use this command to match origin code.

Use the no parameter with this command to disable this matching.

The origin attribute defines the origin of the path information. The egp parameter is indicated as an e in the routing table, and it indicates that the origin of the information is learned via Exterior Gateway Protocol. The igp parameter is indicated as i in the routing table, and it indicates the origin of the path information is interior to the originating AS.

The incomplete parameter is indicated as a ? in the routing table, and indicates that the origin of the path information is unknown or learned through other means. If a static route is redistributed into BGP, the origin of the route is incomplete.

The match origin command specifies the origin to be matched. If there is a match for the specified origin, and permit is specified, the route is redistributed or controlled as specified by the set action. If the match criteria are met, and deny is specified, the route is not redistributed or controlled. If the match criteria are not met, the route is neither accepted nor forwarded, irrespective of permit or deny specifications.

The route specified by the policies might not be the same as specified by the routing protocols. Setting policies enable packets to take different routes depending on their length or content. Packet forwarding based on configured policies overrides packet forwarding specified in routing tables.

## Command Syntax

match origin { egp | igp | incomplete }

no match origin

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| egp | learned from EGP | - |
| igp | Local IGP | - |
| incomplete | Unknown heritage | - |

## Command Mode

Route-map Configuration

## Default

No match origin is specified by default.

## Usage

This command is valid for BGP only.

## Examples

```
Switch# configure terminal
Switch(config)# route-map myroute deny 34
Switch(config-route-map)# match origin egp
```

## Related Commands

None

## 6.4.12 match route-type external

### Command Purpose

Use this command to match specified external route type.

Use the no parameter with this command to turn off the matching.

Use the match route-type external command to match specific external route types. AS-external LSA is either Type-1 or Type-2. External type-1 matches only Type 1 external routes, and external type-2 matches only Type 2 external routes.

### Command Syntax

match route-type external { type-1 | type-2 }

no match route-type external

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| type-1 | Match OSPF External Type 1 metrics | - |
| type-2 | Match OSPF External Type 1 metrics | - |

### Command Mode

Route-map Configuration

### Default

No match route-type is specified by default.

### Usage

This command is valid for OSPF only.

### Examples

```
Switch# configure terminal
Switch(config)# route-map mymap1 permit 10
Switch(config-route-map)# match route-type external type-1
```

### Related Commands

match tag

## 6.4.13 match tag

### Command Purpose

Use this command to match the specified tag value.

Use the no parameter with this command to turn off the declaration.

Use the match tag command to match the specified tag value.

### Command Syntax

match tag *TAG*

no match tag

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| TAG | Specifies the tag value | 0-4294967295 |

### Command Mode

Route-map Configuration

### Default

No match tag is specified by default.

### Usage

This command is valid for OSPF RIP only.

### Examples

```
Switch# configure terminal
Switch(config)# route-map mymap1 permit 10
Switch(config-route-map)# match tag 100
```

### Related Commands

match metric

match route-type external

## 6.4.14 set aggregator

### Command Purpose

Use this command to set the AS number for the route map and router ID.

Use the no parameter with this command to disable this function.

An Autonomous System (AS) is a collection of networks under a common administration sharing a common routing strategy. It is subdivided by areas, and is assigned a unique 16-bit number. Use the set aggregator command to

assign an AS number for the aggregator.

To use the set aggregator command, you must first have a match clause. Match and set commands set the conditions for redistributing routes from one routing protocol to another. The match command specifies the match criteria under which redistribution is allowed for the current route-map. The set command specifies the set redistribution actions to be performed, if the match criteria are met.

If the packets do not match any of the defined criteria, they are routed through the normal routing process.

### Command Syntax

set aggregator as *ASNUM IPADDRESS*

no set aggregator

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ASNUM | Specifies the AS number of aggregator | 1-65535 |
| IPADDRESS | Specifies the IP address of aggregator | - |

### Command Mode

Route-map Configuration

### Default

No set aggregator is specified by default.

### Usage

This command is valid for BGP only.

### Examples

```
Switch# configure terminal
Switch(config)# route-map myroute permit 3
Switch(config-route-map)# set aggregator as 43 10.10.0.3
```

### Related Commands

None

## 6.4.15 set as-path

### Command Purpose

Use this command to modify an autonomous system path for a route.

Use the no parameter with this command to disable this function.

Use the set as-path command to specify an autonomous system path. By specifying the length of the AS-Path, the router influences the best path selection by a neighbor. this command to prepend an AS path string to routes increasing the AS path length.

To use the set as-path command, you must first have a match clause. Match and set commands set the conditions for redistributing routes from one routing protocol to another. The match command specifies the match criteria under which redistribution is allowed for the current route-map. The set command specifies the set redistribution actions to be performed, if the match criteria are met.

If the packets do not match any of the defined criteria, they are routed through the normal routing process.

## Command Syntax

set as-path prepend *ASN* [ ...*ASN* ]

no set as-path

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ASN | System prepends this number to the AS path or overwrite the AS path | 1-4294967295 |

## Command Mode

Route-map Configuration

## Default

No set as-path is specified by default.

## Usage

This command is valid for BGP only.

## Examples

```
Switch# configure terminal
Switch(config)# route-map myroute permit 3
Switch(config-route-map)# set as-path prepend 8 24
```

## Related Commands

None

# 6.4.16 set atomic-aggregate

## Command Purpose

Use this command to set an atomic aggregate attribute.

Use the no parameter with this command to disable this function

To use the set atomic aggregate command, you must first have a match clause. Match and set commands set the conditions for redistributing routes from one routing protocol to another. The match command specifies the match criteria under which redistribution is allowed for the current route-map. The set command specifies the set redistribution actions to be performed, if the match criteria are met.

If the packets do not match any of the defined criteria, they are routed through the normal routing process.

## Command Syntax

set atomic-aggregate

no set atomic-aggregate

## Command Mode

Route-map Configuration

## Default

No set atomic-aggregate is specified by default.

## Usage

This command is valid for BGP only.

## Examples

```
Switch# configure terminal
Switch(config)# route-map rmap1 permit 3
Switch(config-route-map)# set atomic-aggregate
```

## Related Commands

None

## 6.4.17 set comm-list delete

### Command Purpose

Use this command to delete the matched communities from the community attribute of an inbound or outbound update when applying route-map.

Use the no parameter with this command to disable this feature.

### Command Syntax

set comm-list { *STANDARD_ID* | *EXPANDED_ID* | *WORD* } delete

no set comm-list

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| STANDARD_ID | Standard community-list number | 1-99 |
| EXPANDED_ID | Expanded community-list number | 100-199 |
| WORD | Name of the Community-list | A string with 1-20 characters, the first character should be among [a-zA-Z0-9] |
| delete | Delete matching communities | - |

### Command Mode

Route-map Configuration

### Default

No set comm-list is specified by default.

### Usage

This command is valid for BGP only.

### Examples

```
Switch# configure terminal
Switch(config)# route-map rmap1 permit 3
Switch(config-route-map)# set comm-list 34 delete
```

### Related Commands

None

## 6.4.18 set community

### Command Purpose

Use this command to set the communities attribute.

Use the no parameter with this command to delete the entry.

Use this command to set the community attribute and group destinations in a certain community, as well as, apply routing decisions according to those communities.

To use the set community command, you must first have a match clause. Match and set commands set the conditions for redistributing routes from one routing protocol to another. The match command specifies the match criteria under which redistribution is allowed for the current route-map. The set command specifies the set redistribution actions to be performed, if the match criteria are met.

If the packets do not match any of the defined criteria, they are routed through the normal routing process.

### Command Syntax

set community [ *AA:NN* | internet | *local-AS* | no-advertise | no-export ]

set community none

no set community

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| AA:NN | AA:NN: Specifies the community number in this format<br>AA = The AS number<br><br>NN = The number assigned to community | AA is in the range 1-65535<br>NN is in the range of 1-65535 |
| internet | Specifies the Internet (well-known community) | - |
| local-AS | Specifies no sending outside the local AS (well-known community) | - |
| no-advertise | Specifies no advertisement of this route to any peer (well-known community) | - |
| no-export | Specifies no advertisement of this route to next AS (well-known community) | - |
| none | Removes the community attribute from the prefixes that pass the route-map | - |

## Command Mode

Route-map Configuration

## Default

No set community is specified by default.

## Usage

This command is valid for BGP only.

## Examples

```
Switch# configure terminal
Switch(config)# route-map rmap1 permit 3
Switch(config-route-map)# set community no-export no-advertise
Switch# configure terminal
Switch(config)# route-map rmap1 permit 3
Switch(config-route-map)# set community no-advertise
Switch# configure terminal
```

```
Switch(config)# route-map rmap1 permit 3
Switch(config-route-map)# set community 10:01 23:34 12:14 no-export
```

### Related Commands

None

## 6.4.19 set dampening

### Command Purpose

Use this command to enable route-flap dampening and set parameters.

Use the no parameter with this command to disable it.

Set the unreachability half-life time to be equal to, or greater than, reachability half-life time. The suppress-limit value must be greater than or equal to the reuse limit value.

### Command Syntax

set dampening *REACHTIME REUSE SUPPRESS MAXSUPPRESS* [ *UNREACHTIME* ]

no set dampening

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| REACHTIME | Specifies the reachability half-life time in minutes. The time for the penalty to decrease to one-half of its current value. The default is 15 minutes | 1-45 |
| REUSE | Specifies the reuse-limit value. When the penalty for a suppressed route decays below the reuse value, the routes become unsuppressed. The default reuse limit is 750 | 1-20000 |
| SUPPRESS | Specifies the suppress-limit value. When the penalty for a route exceeds the suppress value, the route is suppressed. The default suppress limit is 2000 | 1-20000 |

| | | |
|---|---|---|
| MAXSUPPRESS | Specifies the max-suppress-time. Maximum time that a dampened route is suppressed. The default max-suppress value is 4 times the half-life time (60 minutes) | 1-255 |
| UNREACHTIME | Specifies the un-reachability half-life time for penalty, in minutes. The default value is 15 minutes | 1-45 |

### Command Mode

Route-map Configuration

### Default

Reference to the syntax description above.

### Usage

This command is valid for BGP only.

### Examples

```
Switch# configure terminal
Switch(config)# route-map R1 permit 24
Switch(config-route-map)# set dampening 20 333 534 30
```

### Related Commands

None

## 6.4.20 set extcommunity

### Command Purpose

Use this command to set an extended community attribute.

Use the no parameter with this command to disable this function

To use the set extcommunity command, you must first have a match clause. Match and set commands set the conditions for redistributing routes from one routing protocol to another. The match command specifies the match criteria under which redistribution is allowed for the current route-map. The set command specifies the set redistribution actions to be performed, if the match criteria are met.

If the packets do not match any of the defined criteria, they are routed through the normal routing process.

This command is valid for BGP only.

## Command Syntax

set extcommunity { rt | soo } *EXTCOMMNUMBER* [ ...*EXTCOMMNUMBER* ]

no set extcommunity { rt | soo }

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| rt | Specifies the route target of the extended community | - |
| soo | Specifies the site-of-origin of the extended community | - |
| EXTCOMMNUMBER | ASN:NN or IP-address nn VPN extended community | - |
| ASN:NN | the AS number | ASN is in the range 1-65535<br>NN is in the range of 1-65535 |
| IPADDRESS | the AS number in IP address form | IPv4 Address in A.B.C.D format |

## Command Mode

Route-map Configuration

## Default

No set extcommunity is specified by default.

## Usage

None

## Examples

```
Switch# configure terminal
Switch(config)# route-map rmap1 permit 3
Switch(config-route-map)# set extcommunity rt 06:01
Switch# configure terminal
Switch(config)# route-map rmap1 permit 3
Switch(config-route-map)# set extcommunity rt 0.0.0.6:01
Switch# configure terminal
Switch(config)# route-map rmap1 permit 3
Switch(config-route-map)# set extcommunity soo 06:01
Switch# configure terminal
Switch(config-route-map)# route-map rmap1 permit 3
Switch(config-route-map)# set extcommunity soo 0.0.0.6:01
```

## Related Commands

None

# 6.4.21 set ip next-hop ip-group

## Command Purpose

Use this command to set the specified next-hop ip-group value.

Use the no parameter with this command to turn off the setting.

Use this command to set the next-hop IP address to the routes.

## Command Syntax

set ip next-hop ip-group *NAME*

no set ip next-hop ip-group

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | Specifies the IP address of the next-hop ip-group | Up to 32 characters |

## Command Mode

Route-map Configuration

### Default

No set ip next-hop ip-group is specified by default.

### Usage

This command is valid for PBR only.Configuring the set ip next-hop ip-group command causes the system to use policy-based routing first and then use the routing table.

### Examples

The following example shows how to set the next-hop ip-group:

```
Switch# configure terminal
Switch(config)# route-map mymap permit 3
Switch(config-route-map)# set ip next-hop ip-group aaa
```

### Related Commands

None

## 6.4.22 set ip default next-hop ip-group

### Command Purpose

Use this command to set the specified default next-hop ip-group value.

Use the no parameter with this command to turn off the setting.

Use this command to set the next-hop IP address to the routes.

### Command Syntax

set ip default next-hop ip-group *NAME*

no set ip default next-hop ip-group

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | Specifies the IP address of the next-hop ip-group | Up to 32 characters |

### Command Mode

Route-map Configuration

### Default

No set ip default next-hop ip-group is specified by default.

### Usage

This command is valid for PBR only.Configuring the set ip default next-hop command causes the system to use the routing table first and then the policy route to the specified nexthop.

### Examples

The following example shows how to set the default next-hop ip-group:

```
Switch# configure terminal
Switch(config)# route-map mymap permit 3
Switch(config-route-map)# set ip default next-hop ip-group aaa
```

### Related Commands

None

## 6.4.23 set ip next-hop

### Command Purpose

Use this command to set the specified next-hop value.

Use the no parameter with this command to turn off the setting.

Use this command to set the next-hop IP address to the routes.

### Command Syntax

set ip next-hop *A.B.C.D* ( track *object_id* | )

no set ip next-hop ( track | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| A.B.C.D | Specifies the IP address of the next-hop | IPv4 Address in A.B.C.D format |
| object_id | Object identity is used to identify track object | 1-500 |

## Command Mode

Route-map Configuration

## Default

No set ip next-hop is specified by default.

## Usage

This command is valid for BGP, OSPF, RIP and PBR only.Configuring the set ip next-hop command causes the system to use policy-based routing first and then use the routing table. Configured with track command will bind nexthop with track, when track down, the nexthop will be invalided. Use the no command with track will unbind nexthop with track.

## Examples

The following example shows how to set the next-hop IP address:

```
Switch# configure terminal
Switch(config)# route-map mymap permit 3
Switch(config-route-map)# set ip next-hop 10.10.0.67
```

The following example shows how to set the next-hop IP address and bind with track:

```
Switch# configure terminal
Switch(config)# track 1 interface eth-0-1 linkstate
Switch(config-track)# quit
Switch(config)# route-map mymap permit 3
Switch(config-route-map)# set ip next-hop 10.10.0.67 track 1
```

## Related Commands

None

# 6.4.24 set ip vrf next-hop

## Command Purpose

Use this command to set the specified vrf and next-hop value.

Use the no parameter with this command to turn off the setting.

Use this command to set the vrf and next-hop IP address to the routes.

## Command Syntax

set ip vrf *WORD* next-hop *A.B.C.D* ( track *object_id* | )

no set ip next-hop ( track | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| A.B.C.D | Specifies the IP address of the next-hop | IPv4 Address in A.B.C.D format |
| object_id | Object identity is used to identify track object | 1-500 |
| WORD | VPN Routing/Forwarding instance name | Up to 15 characters |

## Command Mode

Route-map Configuration

## Default

No set ip next-hop is specified by default.

## Usage

This command is valid PBR only.Configuring the set ip vrf next-hop command causes the system to use policy-based routing first and then use the routing table. Configured with track command will bind nexthop with track, when track down, the nexthop will be invalided. Use the no command with track will unbind nexthop with track.

## Examples

The following example shows how to set the next-hop IP address and vrf.:

```
Switch# configure terminal
Switch(config)# route-map mymap permit 3
Switch(config-route-map)# set ip vrf test next-hop 10.10.0.67
```

## Related Commands

None

# 6.4.25 set ip default next-hop

## Command Purpose

Use this command to set the specified default next-hop value.

Use the no parameter with this command to turn off the setting.

Use this command to set the default next-hop IP address to the routes.

## Command Syntax

set ip default next-hop *A.B.C.D* ( track *object_id* | )

no set ip default next-hop ( track | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| A.B.C.D | Specifies the IP address of the default next-hop | IPv4 Address in A.B.C.D format |
| object_id | Object identity is used to identify track object | 1-500 |

## Command Mode

Route-map Configuration

## Default

No set ip default next-hop is specified by default.

## Usage

This command is valid for PBR only.Configuring the set ip default next-hop command causes the system to use the routing table first and then the policy route to the specified nexthop. Configured with track command will bind nexthop with track, when track down, the nexthop will be invalided. Use the no command with track will unbind nexthop with track.

## Examples

The following example shows how to set the default next-hop IP address and bind with track:

```
Switch# configure terminal
Switch(config)# track 1 interface eth-0-1 linkstate
Switch(config-track)# quit
Switch(config)# route-map mymap permit 4
Switch(config-route-map)# set ip default next-hop 10.10.0.68 track 1
```

The following example shows how to unbind track with next-hop IP address:

```
Switch# configure terminal
Switch(config)# route-map mymap permit 4
Switch(config-route-map)# no set ip default next-hop track
```

## Related Commands

None

# 6.4.26 set ip default vrf next-hop

## Command Purpose

Use this command to set the specified default next-hop value and the vrf.

Use the no parameter with this command to turn off the setting.

Use this command to set the default next-hop IP address and vrf to the routes.

## Command Syntax

set ip default vrf *WORD* next-hop *A.B.C.D* ( track *object_id* | )

no set ip default next-hop ( track | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| A.B.C.D | Specifies the IP address of the default next-hop | IPv4 Address in A.B.C.D format |
| object_id | Object identity is used to identify track object | 1-500 |
| WORD | VPN Routing/Forwarding instance name | Up to 15 characters |

## Command Mode

Route-map Configuration

## Default

No set ip default vrf next-hop is specified by default.

## Usage

This command is valid for PBR only.Configuring the set ip default vrf next-hop command causes the system to use the routing table first and then the policy route to the specified nexthop and vrf. Configured with track command will bind nexthop with track, when track down, the nexthop will be invalided. Use the no command with track will unbind nexthop with track.

## Examples

The following example shows how to set the default next-hop vrf IP address and bind with track:

```
Switch# configure terminal
Switch(config)# track 1 interface eth-0-1 linkstate
Switch(config-track)# quit
Switch(config)# route-map mymap permit 4
Switch(config-route-map)# set ip default vrf test next-hop 10.10.0.68 track 1
```

## Related Commands

None

# 6.4.27 set local-preference

## Command Purpose

Use this command to set the specified local-preference value.

Use the no parameter with this command to turn off the setting.

Use this command to set the local-preference value of the routes

## Command Syntax

set local-preference *LOCAL-PREFERENCE*

no set local-preference

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LOCAL-PREFERENCE | Species the preference value | 0-4294967295 |

## Command Mode

Route-map Configuration

## Default

No set local-preference is specified by default.

## Usage

This command is valid for BGP only.

## Examples

```
Switch# configure terminal
Switch(config)# route-map mymap permit 3
Switch(config-route-map)# set local-preference 100
```

## Related Commands

None

# 6.4.28 set metric

## Command Purpose

Use this command to set a metric value for a route.

Use the no parameter with this command to disable this function.

This command sets the metric value for a route, and influences external neighbors about the preferred path into an Autonomous System (AS). The preferred path is the one with a lower metric value. A router compares metrics for paths from neighbors in the same ASs. To compare metrics from neighbors coming from different ASs, use the bgp always-compare-med command.

To use the set metric command, you must first have a match clause. Match and set commands set the conditions for redistributing routes from one routing protocol to another. The match command specifies the match criteria under which redistribution is allowed for the current route-map. The set command specifies the set redistribution actions to be performed, if the match criteria are met.

If the packets do not match any of the defined criteria, they are routed through the normal routing process.

## Command Syntax

set metric *METRICVAL*

no set metric

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| METRICVAL | The metric value | 0-4294967295 |

## Command Mode

Route-map Configuration

## Default

No set metric is specified by default.

## Usage

This command is valid for BGP, OSPF and RIP.

## Examples

```
Switch# configure terminal
Switch(config)# route-map rmap1 permit 3
Switch(config-route-map)# set metric 600
```

## Related Commands

None

# 6.4.29 set metric-type

## Command Purpose

Use this command to set the metric type for the destination routing protocol.

Use the no parameter with this command to return to the default.

This command sets the type to either Type-1 or Type-2 in the AS-external-LSA when the route-map matches the condition.

## Command Syntax

set metric-type { type1 | type2 }

no set metric-type

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| type1 | Select to set external type 1 metric | - |
| type2 | Select to set external type 2 metric | - |

## Command Mode

Route-map Configuration

## Default

No set metric-type is specified by default.

## Usage

This command is valid for OSPF only.

## Examples

```
Switch# configure terminal
Switch(config)# route-map rmap1 permit 3
Switch(config-route-map)# set metric-type 1
```

## Related Commands

None

# 6.4.30 set origin

## Command Purpose

Use this command to set the BGP origin code.

Use the no parameter with this command to delete an entry.

The origin attribute defines the origin of the path information. The three parameters with this command indicate three different values. IGP is interior to the originating AS. This happens if IGP is redistributed into the BGP. EGP is learned through an Exterior Gateway Protocol. Incomplete is unknown or learned through some other means. This happens when static route is redistributed in BGP and the origin of the route is incomplete.

## Command Syntax

set origin { egp | igp | incomplete }

no set origin

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| egp | Specifies a remote EGP system | - |

| | | |
|---|---|---|
| igp | A local IGP system | - |
| incomplete | Specifies a system of unknown heritage | - |

## Command Mode

Route-map Configuration

## Default

No set origin is specified by default.

## Usage

This command is valid for BGP only.

## Examples

```
Switch# configure terminal
Switch(config)# route-map rmap1 permit 3
Switch(config-route-map)# set origin egp
```

## Related Commands

None

# 6.4.31 set originator-id

## Command Purpose

Use this command to set the originator ID attribute.

Use the no parameter with this command to disable this function.

To use the set originator-id command, you must first have a match clause. Match and set commands set the conditions for redistributing routes from one routing protocol to another. The match command specifies the match criteria under which redistribution is allowed for the current route-map. The set command specifies the set redistribution actions to be performed, if the match criteria are met.

If the packets do not match any of the defined criteria, they are routed through the normal routing process.

## Command Syntax

set originator-id *IPADDRESS*

no set originator-id

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IPADDRESS | Specifies the IP address of originator | IPv4 Address in A.B.C.D format |

## Command Mode

Route-map Configuration

## Default

No set originator-id is specified by default.

## Usage

This command is valid for BGP only.

## Examples

```
Switch# configure terminal
Switch(config)# route-map rmap1 permit 3
Switch(config-route-map)# set originator-id 1.1.1.1
```

## Related Commands

None

# 6.4.32 set tag

## Command Purpose

Use this command to set a specified tag value.

Use the no parameter with this command to return to the default.

Tag in this command is the route tag which is labeled by another routing protocol (BGP or other IGP when redistributing), because AS-external-LSA has a route-tag field in its LSAs. Also, with using route-map, ZebOS can tag the LSAs with the

appropriate tag value. Sometimes, the tag matches with using route-map, and sometimes, the value

may be used by another application.

## Command Syntax

set tag *TAGVALUE*

no set tag

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| TAGVALUE | Tag value for destination routing protocol. | 0-4294967295 |

## Command Mode

Route-map Configuration

## Default

No set tag is specified by default.

## Usage

This command is valid for OSPF and RIP only.

## Examples

```
Switch# configure terminal
Switch(config)# route-map rmap1 permit 3
Switch(config-route-map)# set tag 6
```

## Related Commands

redistribute

default-information

## 6.4.33 set vpnv4 next-hop

### Command Purpose

Use this command to set a VPNv4 next-hop address.

Use the no parameter with this command to disable this function

### Command Syntax

set vpnv4 next-hop *IPADDRESS*

no set vpnv4 next-hop

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IPADDRESS | Specifies the IP address of next-hop | IPv4 Address in A.B.C.D format |

### Command Mode

Route-map Configuration

### Default

No set vpnv4 next-hop is specified by default.

### Usage

This command is valid for BGP only.

### Examples

```
Switch# configure terminal
Switch(config)# route-map rmap1 permit 3
Switch(config-route-map)# set vpnv4 next-hop 6.6.6.6
```

### Related Commands

None

# 6.4.34 set weight

## Command Purpose

Use this command to set weights for the routing table.

Use the no parameter with this command to delete an entry.

The weight value is used to assist in best path selection. It is assigned locally to a router. When there are several routes with a common destination, the routes with a higher weight value are preferred.

## Command Syntax

set weight *WEIGHT*

no set weight

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| WEIGHT | Specifies the weight value | 0-4294967295 |

## Command Mode

Route-map Configuration

## Default

No set weight is specified by default.

## Usage

This command is valid for BGP only.

## Examples

```
Switch# configure terminal
Switch(config)# route-map rmap1 permit 3
Switch(config-route-map)# set weight 60
```

## Related Commands

match as-path

# 6.4.35 show route-map

## Command Purpose

Use this command to display user readable route-map information.

## Command Syntax

show route-map ( *NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | route-map name | Up to 20 characters |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

```
Switch1# show route-map
route-map abc, permit, sequence 10
  Match clauses:
    ip address acl1
  Set clauses:
    local-preference 200
route-map abc, permit, sequence 20
  Match clauses:
  Set clauses:
```

## Related Commands

route-map

# 6.5 Prefix-list Commands

## 6.5.1 ip prefix-list

### Command Purpose

To create a prefix list or add a prefix-list entry, use the ip prefix-list command in global configuration mode. To delete a prefix-list or an entry, use the no form of this command.

### Command Syntax

ip prefix-list *WORD* ( seq *SEQUENCE-NUMBER* | ) ( deny | permit ) ( any | *A.B.C.D/M* ( ge *GE-LENGTH* | ) ( le *LE-LENGTH* | ) )

( any | *A.B.C.D/M* ( ge *GE-LENGTH* | ) ( le *LE-LENGTH* | ) )

no ip prefix-list *WORD* ( seq *SEQUENCE-NUMBER* | ) ( deny | permit ) ( any | *A.B.C.D/M* ( ge *GE-LENGTH* | ) ( le *LE-LENGTH* | ) )

no ip prefix-list *WORD* ( seq *SEQUENCE-NUMBER* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| WORD | Config a name to identify the prefix list | Up to 40 characters |
| seq SEQUENCE-NUMBER | Applies a sequence number to a prefix-list entry. If a sequence number is not entered when configuring this command, a default sequence numbering is applied to the prefix list. The number 5 is applied to the first prefix entry, and subsequent unnumbered entries are incremented by 5 | 1-65535 |
| deny | Denies access for a matching condition | - |
| permit | Permits access for a matching condition | - |

| | | |
|---|---|---|
| A.B.C.D/M | Configures the network address, and the length of the network mask in bits. The network number can be any valid IP address or prefix. The bit mask can be a number from 0 to 32 | IPv4 Address and mask length in A.B.C.D/M format |
| ge GE-LENGTH | (Optional)Specifies the lesser value of a range (the "from" portion of the range description) by applying the ge-length argument to the range specified. The ge-length argument represents the minimum prefix length to be matched | 1-32 |
| le LE-LENGTH | (Optional)Specifies the greater value of a range (the "to" portion of the range description) by applying the le-length argument to the range specified. The le-length argument represents the maximum prefix length to be matched | 1-32 |

## Command Mode

Global Configuration

## Default

No prefix lists are created.

## Usage

The ip prefix-list command is used to configure IP prefix filtering. Prefix lists are configured with permit or deny keywords to either permit or deny the prefix based on the matching condition. A prefix list consists of an IP address and a bit mask. The IP address can be a classful network, a subnet, or a single host route. The bit mask is entered as a number from 1 to 32. An implicit deny is applied to traffic that does not match any prefix-list entry. Prefix lists are configured to match an exact prefix length or a prefix range. The ge and le keywords are used to specify a range of the prefix lengths to match, providing more flexible configuration than can be

configured with just the network/length argument. The prefix list is processed using an exact match when neither the ge nor le keyword is entered. If only the ge value is entered, the range is the value entered for the ge ge-length argument to a full 32-bit length. If only the le value is entered, the range is from value entered for the network/length argument to the le le-length argument. If both the ge ge-length and le le-length keywords and arguments are entered, the range falls between the values used for the ge-length and le-length arguments. The following formula shows this behavior:

Network/length < ge ge-length < le le-length <= 32.

A prefix list is configured with a name and/or sequence number. One or the other must be entered when configuring this command. If a sequence number is not entered, a default sequence number of 5 is applied to the prefix list. And subsequent prefix list entries will be increment by 5 (for example, 5, 10, 15, and onwards). If a sequence number is entered for the first prefix list entry but not subsequent entries, then the subsequent entries will also be incremented by 5 (For example, if the first configured sequence number is 3, then subsequent entries will be 8, 13, 18, and onwards). Default sequence numbers can be suppressed by entering the no form of this command with the seq keyword. Prefix lists are evaluated starting with the lowest sequence number and continues down the list until a match is made. Once a match is made that covers the network the permit or deny statement is applied to that network and the rest of the list is not evaluated.

## Examples

To deny the default route 0.0.0.0/0:

```
Switch# configure terminal
Switch(config)# ip prefix-list abc deny 0.0.0.0/0
```

To permit the prefix10.0.0.0/8:

```
Switch# configure terminal
Switch(config)# ip prefix-list abc permit 10.0.0.0/8
```

To accept a mask length of up to 24 bits in routes with the prefix 192/16:

```
Switch# configure terminal
Switch(config)# ip prefix-list abc permit 192.168.0.0/16 le 24
```

To deny mask lengths greater than 25 bits in routes with the prefix 192/16:

```
Switch# configure terminal
Switch(config)# ip prefix-list abc deny 192.168.0.0/16 ge 25
```

### Related Commands

ip prefix-list description

ip prefix-list sequence

show ip prefix-list

clear ip prefix-list

## 6.5.2 ip prefix-list description

### Command Purpose

To add a text description of a prefix list, use the ip prefix-list description command in global

configuration mode. To remove the text description, use the no form of this command

### Command Syntax

ip prefix-list *WORD* description *LINE*

no ip prefix-list *WORD* description

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| WORD | Name of prefix list | Up to 40 characters |

### Command Mode

Global Configuration

### Default

There is no description for prefix-list.

### Usage

The prefix list will be created automatically if it didn't exist.

### Examples

The following example shows how to add description:

```
Switch# configure terminal
Switch(config)# ip prefix-list abc description Deny routes from router A
```

### Related Commands

ip prefix-list

ip prefix-list sequence

show ip prefix-list

clear ip prefix-list

## 6.5.3 ip prefix-list sequence-number

### Command Purpose

To enable the generation of sequence numbers for entries in a prefix list, use the ip prefix-list sequence-number command in global configuration mode. To disable this function, use the no form of this command.

### Command Syntax

ip prefix-list sequence-number

no ip prefix-list sequence-numbe

### Command Mode

Global Configuration

### Default

This command has no default behavior.

### Usage

This command is used to enable sequence-number display.

### Examples

The following example shows how to enable ip prefix-list sequence-number:

```
Switch# configure terminal
Switch(config)# ip prefix-list sequence-number
```

### Related Commands

ip prefix-list

show ip prefix-list

clear ip prefix-list

## 6.5.4 show ip prefix-list

### Command Purpose

To show prefix list information, use the show ip prefix-list command.

### Command Syntax

show ip prefix-list ( summary | detail | ) ( *WORD* | )

show ip prefix-list *WORD* ( seq *SEQUENCE-NUMBER* | *A.B.C.D/M* ( longer | first-match | ) | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| summary | Summary of prefix lists | - |
| detail | Detail of prefix lists | - |
| WORD | Name of the prefix list | Up to 40 characters |
| seq SEQUENCE-NUMBER | sequence number of the entry in the prefix list | 1-65535 |
| A.B.C.D/M | IP prefix <network>/<length>, e.g., 35.0.0.0/8 | IPv4 Address and mask length in A.B.C.D/M format |
| longer | Lookup the mask of prefix longer than M | - |
| first-match | First matched prefix | - |

### Command Mode

Privileged EXEC

## Default

This command has no default behavior.

## Usage

None

## Examples

The following example shows how to display ip prefix-list:

```
Switch# show ip prefix-list
ip prefix-list aa: 2 entries
  permit 1.1.1.0/24
  permit 1.2.3.0/24
```

## Related Commands

ip prefix-list

clear ip prefix-list

# 6.5.5 clear ip prefix-list

## Command Purpose

To Resets the hit count of the prefix list entries, use the clear ip prefix-list command.

## Command Syntax

clear ip prefix-list ( *WORD* ( *A.B.C.D/M* | ) | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| WORD | Name of the prefix list | Up to 40 characters |
| A.B.C.D/M | IP prefix <network>/<length>, e.g., 35.0.0.0/8 | IPv4 Address and mask length in A.B.C.D/M format |

## Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following example shows how to clear ip prefix-list:

```
Switch# clear ip prefix-list abc
```

### Related Commands

ip prefix-list

## 6.6 Policy-Based Routing Commands

### 6.6.1 ip policy route-map

### Command Purpose

By default, PBR is disabled on the switch. To enable PBR, you must create a route map that specifies the match criteria and the resulting action if all of the match clauses are met. Then, you must enable PBR on a layer3 interface. All packets arriving on the specified interface matching the match clauses are subject to PBR.

### Command Syntax

ip policy route-map *MAP_NAME*

no ip policy route-map

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MAP_NAME | policy route-map name | Up to 20 characters |

### Command Mode

Interface Configuration

## Default

disabled

## Usage

This command can only be configured on routed port, vlan interface and routed agg port.

## Examples

The following example shows how to configure pbr on an interface:

```
Switch# configure terminal
switch (config)# ip access-list 1 extend
switch (config-ex-ip-acl)# 10 permit any any any
switch (config-route-map)#exit
switch (config)#route-map richard permit 10
switch (config-route-map)#match ip address 1
switch (config-route-map)#set ip next-hop 10.1.1.1
switch (config-route-map)#exit
switch (config)#interface eth-0-1
switch (config-if)#no switch port
switch (config-if)#no shutdown
switch (config-if)#ip policy route-map richrad
```

## Related Commands

route-map

# 6.6.2 ip-group

## Command Purpose

Use this command to set the ip-group.

## Command Syntax

ip-group *NAME* ( vrf *WORD* | ) ( load-share | )

no ip-group *NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MAP_NAME | ip-group name | Up to 32 characters |

| | | |
|---|---|---|
| WORD | vrf name | Up to 31 characters |
| load-share | load-share mode | - |

## Command Mode

Global Configuration

## Default

No set ip-group is specified by default.

## Usage

Use this command to configure ip-group which is uesd by pbr.

## Examples

The following example shows how to configure ip-group:

```
Switch# configure terminal
switch (config)# ip-group aaa
```

## Related Commands

route-map

# 6.6.3 ip-member

## Command Purpose

Use this command to set the ip-member.

## Command Syntax

member ip *A.B.C.D* ( priority *PRIORITY* ) ( track *object_id* | )

no member ip *A.B.C.D* ( track | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| A.B.C.D | ip-member address | IPv4 Address in A.B.C.D format |
| PRIORITY | member priority | 0-65535 |

| | | |
|---|---|---|
| object_id | Object identity is used to identify track object | 1-500 |

## Command Mode

Ip-group Configuration

## Default

No set ip-member is specified by default.

## Usage

Use this command to configure ip-member in ip-group.

## Examples

The following example shows how to configure ip-member:

```
Switch# configure terminal
switch (config)# ip-group aaa
switch (config-ip-group)# member ip 1.1.1.1
```

## Related Commands

route-map

# 6.6.4 show ip-group

## Command Purpose

Use this command to display user readable ip-group information

## Command Syntax

show ip-group ( *NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | ip-group name | Up to 20 characters |

## Command Mode

Privileged EXEC

## Default

Disabled

## Usage

None

## Examples

```
SWITCH# show ip -group
Switch# show ip-group
Group name: aaa    VRF: -    Mode: -
------------------------------------------------------------------------
Member ip              Priority         Track id         Track state
------------------------------------------------------------------------
 2.2.2.2               20               -                Disable
```

## Related Commands

None

# 6.6.5 show ip policy route-map

## Command Purpose

Use this command to display user readable policy route-map information

## Command Syntax

show ip policy route-map

## Command Mode

Privileged EXEC

## Default

Disabled

## Usage

If some of the PBR entries are not successfully inserted into tcam, an error tip will be displayed.

## Examples

```
SWITCH# show ip policy route-map
Route-map                     interface
richard                        eth-0-1
                              eth-0-3
Failed entry: no
sally                          eth-0-2
Failed entry: yes
Please use Policy Based-Routing CLI: show pbr failed entry to gain more detail。
```

## Related Commands

route-map

# 6.6.6 show resource pbr

## Command Purpose

Use this command to display the resource usage over the policy based routing module.

## Command Syntax

show resource pbr

## Command Mode

Privileged EXEC

## Default

Disabled

### Usage

None

### Examples

```
SWITCH# show resource pbr
Policy Based Routing
Resource                          Used          Capability
============================================================
Policy Route Map                  0             32
Policy Based Routing ACE          0             64
```

### Related Commands

route-map

show ip policy route-map

## 6.7 BGP Commands

### 6.7.1 address-family

### Command Purpose

Use this command to enter the IPv4, VPNv4 address-family command mode.

### Command Syntax

address-family ipv4 ( unicast | vrf *NAME* | )

address-family vpnv4 ( unicast )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| vpnv4 | Configures sessions for VPN-IPv4 prefixes. This parameter takes an IPv4 style address: A.B.C.D. | - |
| unicast | Specifies unicast prefixes | - |
| vrf | VPN routing/forwarding instance | - |
| NAME | VPN Routing/Forwarding instance name | Up to 31 characters |

### Command Mode

Router Configuration

### Default

None

### Usage

Use the address family command to enter the address family mode allowing configuration of address-family specific parameters.

To leave the address family mode and return to the Configure mode use the exit-address-family command.

### Examples

```
Switch# configure terminal
Switch(config) router bgp 100
Switch(config-router)address-family ipv4
```

### Related Commands

exit-address-family

exit

## 6.7.2 aggregate-address

### Command Purpose

Use this command to configure BGP aggregate entries.

Use the no parameter with this command to disable this function.

### Command Syntax

aggregate-address *IP_PREFIX* { summary-only | as-set }

no aggregate-address *IP_PREFIX* { summary-only | as-set }

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IP_PREFIX | A.B.C.D/M Specifies the aggregate prefix | IPv4 Address and mask length in A.B.C.D/M format |
| summary-only | Filters more specific routes from updates. | - |
| as-set | Generates AS set path information | - |

## Command Mode

Router Configuration

## Default

Disabled

## Usage

Aggregates are used to minimize the size of routing tables. Aggregation combines the characteristics of several different routes and advertises a single route.The aggregate-address command creates an aggregate entry in the BGP routing table if any more-specific BGP routes are available in the specified range. Using the summary-only parameter advertises the prefix only, suppressing the more-specific routes to all neighbors.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 100
Switch(config-router)# aggregate-address 10.0.0.0/8 as-set summary-only
```

## Related Commands

N/A

## 6.7.3 bgp always-compare-med

### Command Purpose

Use this command to compare the Multi Exit Discriminator (MED) for paths from neighbors in different autonomous systems.

Use the no parameter with this command to disallow the comparison.

### Command Syntax

bgp always-compare-med

no bgp always-compare-med

### Command Mode

Router Configuration

### Default

Disabled

### Usage

Multi Exit Discriminator (MED) is used in best path selection by BGP. MED is compared after BGP attributes weight, local preference, AS-path and origin have been compared and are equal.

MED comparison is done only among paths from the same autonomous system (AS). Use bgp always-comparemed command to allow comparison of MEDs from different ASs. The MED parameter is used to select the best path. A path with lower MED is preferred.

### Examples

```
Switch# configure terminal
Switch(config)# router bgp 100
Switch(config-router)# bgp always-compare-med
```

### Related Commands

bgp bestpath med

bgp bestpath as-path ignore

## 6.7.4 bgp as-local-count

### Command Purpose

When AS path is transfered between EBGP neighbor or Confederated IBGP neighbor, uses this command to specify the number of the local AS number prepended to the AS path.

Use the no parameter with this command to remove this configuration.

### Command Syntax

bgp as-local-count *NUM*

no bgp as-local-count

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NUM | The number of the local AS number prepended to the AS path. | 2-64 |

### Command Mode

Router Configuration

### Default

In the default case, the number of the switch AS prepended to the AS path is 1.

### Usage

Use this command to configure the number of prepended local-as number.

### Examples

```
Switch# configure terminal
Switch(config)# router bgp 100
Switch(config-router)# bgp as-local-count 5
```

### Related Commands

N/A

## 6.7.5 bgp bestpath as-path ignore

### Command Purpose

Use this command to prevent the router from considering as-path as a factor in the algorithm for choosing a route.

Use the no parameter with this command to allow the router to consider as-path in choosing a route.

### Command Syntax

bgp bestpath as-path ignore

no bgp bestpath as-path ignore

### Command Mode

Router Configuration

### Default

Disabled

### Usage

None

### Examples

```
Switch# configure terminal
Switch(config) router bgp 100
Switch(config-router) bgp bestpath as-path ignore
```

### Related Commands

bgp always-compare-med, bgp bestpath med, bgp bestpath compare-routerid

## 6.7.6 bgp bestpath compare-confed-aspath

### Command Purpose

Use this command to allow comparing of the confederation AS path length.

Use the no parameter with this command to revert the selection and ignore AS confederation path length in the BGP best path selection.

### Command Syntax

bgp bestpath compare-confed-aspath

no bgp bestpath compare-confed-aspath

### Command Mode

Router Configuration

### Default

BGP receives routes with identical eBGP paths from eBGP peers and selects the first route received as the best path.

### Usage

This command specifies that the AS confederation path length must be used, when available, in the BGP best path decision process. It is effective only when bgp bestpath as-path ignore command has not been specified.

### Examples

```
Switch# configure terminal
Switch(config) router bgp 100
Switch(config-router) bgp bestpath compare-confed-aspath
```

### Related Commands

bgp bestpath as-path ignore

## 6.7.7 bgp bestpath compare-routerid

### Command Purpose

Use this command to compare router-id for identical eBGP paths.

Use the no parameter with this command to disable this function.

### Command Syntax

bgp bestpath compare-routerid

no bgp bestpath compare-routerid

### Command Mode

Router Configuration

### Default

BGP receives routes with identical eBGP paths from eBGP peers and selects the first route received as the best path.

### Usage

When comparing similar routes from peers the BGP router does not consider router ID of the routes. By default, it selects the first received route. Use this command to include router ID in the selection process; similar routes are compared and the route with lowest router ID is selected. The router-id is the highest IP address on the router, with preference given to loopback addresses. Router-id can be manually set by using the bgp router-id command.

### Examples

```
Switch# configure terminal
Switch(config) router bgp 100
Switch(config-router) bgp bestpath compare-routerid
```

### Related Commands

show ip bgp

show ip bgp neighbors

## 6.7.8 bgp bestpath dont-compare-originator-id

### Command Purpose

Use this command to prevent the router from considering originator-id as a factor in the algorithm for choosing a route.

Use the no parameter with this command to allow the router to consider originator-id in choosing a route.

### Command Syntax

bgp bestpath dont-compare-originator-id

no bgp bestpath dont-compare-originator-id

### Command Mode

Router Configuration

### Default

In the default case, BGP will consider originator-id as a factor in choosing a route.

### Usage

Use this command to prevent BGP to consider originator-id as a factor in choosing a route.

### Examples

```
Switch# configure terminal
Switch(config)# router bgp 100
Switch(config-router)# bgp bestpath dont-compare-originator-id
```

### Related Commands

N/A

## 6.7.9 bgp bestpath med

### Command Purpose

Use this command to specify Multi Exit Discriminator (MED) attribute comparison.

Use the no parameter with this command to prevent BGP from considering the MED attribute in comparing paths.

### Command Syntax

bgp bestpath med confed [ missing-as-worst ]

bgp bestpath med missing-as-worst [ confed ]

no bgp bestpath med confed [ missing-as-worst ]

no bgp bestpath med missing-as-worst [ confed ]

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| confed | Compares MED among confederation paths | - |
| missing-as-worst | Treats missing MED as the least preferred one | - |

### Command Mode

Router Configuration

### Default

MED value is zero.

### Usage

Use this command to specify two MED attributes-confed and missing-as-worst. The confed attribute enables MED comparison among paths learned from confederation peers. The MEDs are compared only if there is no external autonomous system (an AS not within the confederation) in the path. If there is an external autonomous system in the path, the MED comparison is not made.

The missing-as-worst attribute to consider a missing MED attribute in a path as having a value of infinity, making the path without a MED value the least desirable path. If missing-as-worst is disabled, the missing MED is assigned the value of 0, making the path with the missing MED attribute the best path.

### Examples

```
Switch# configure terminal
Switch(config) router bgp 100
Switch(config-router) bgp bestpath med missing-as-worst
```

### Related Commands

bgp-always-compare-med, bgp bestpath as-path ignore, bgp deterministic-med

## 6.7.10 bgp bestpath tie-break-on-age

### Command Purpose

Use this command to preferentially choose old routes when other condition is the same in the algorithm for choosing a route.

Use the no parameter with this command to compare addtional information in route choosing rather than the age of route.

### Command Syntax

bgp bestpath tie-break-on-age

no bgp bestpath tie-break-on-age

## Command Mode

Router Configuration

## Default

In the default case, BGP will preferentially choose an old route when other condition is the same.

## Usage

When the the information that influence the quality of routing like aspath、local-preference、med is the same，preferentially chose the old route to prevent route flap.

Use the no parameter with this command to let BGP compara addtional information like router-id、neighbor's address，instead of the age of routes.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 100
Switch(config-router)# no bgp bestpath tie-break-on-age
```

## Related Commands

N/A

# 6.7.11 bgp client-to-client reflection

## Command Purpose

Use this command to restore route reflection from a BGP route reflector to clients.

Use the no parameter with this command to turn off client-to-client reflection.

## Command Syntax

bgp client-to-client reflection

no bgp client-to-client reflection

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| reflection | Allows reflection of routes | - |

## Command Mode

Router Configuration

## Default

When a router is configured as a route reflector, client-to-client reflection is enabled by default.

## Usage

The bgp client-to-client reflection command is used to configure routers as route reflectors. Route reflectors are used when all Interior Border Gateway Protocol (iBGP) speakers are not fully meshed. If the clients are fully meshed the route reflector is not required, use no bgp client-to-client reflection command to disable the client-to-client route reflection.

## Examples

```
Switch# configure terminal
Switch(config) router bgp 100
Switch(config-router) no bgp client-to-client reflection
```

## Related Commands

bgp cluster-id

neighbor route-reflector-client

show ip bgp

# 6.7.12 bgp cluster-id

## Command Purpose

Use this command to configure the cluster ID if the BGP cluster has more than one route reflector.

Use the no parameter with this command to remove the cluster ID.

## Command Syntax

bgp cluster-id *CLUSTERID*

no bgp cluster-id

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| CLUSTERID | Specifies the cluster ID of this router acting as a route reflector, either as IP address or as a maximum of 4 bytes. | IPv4 Address in A.B.C.D format or number in range 1-4294967295 |
| A.B.C.D | A.B.C.D Route Reflector Cluster-id in IP address format | IPv4 Address |
| 1-4294967295 | Route Reflector cluster-id as a 32 bit quantity | 1-4294967295 |

## Command Mode

Router Configuration

## Default

N/A

## Usage

A cluster includes route reflectors and its clients. Usually, each cluster is identified by the router ID of its single route reflector but to increase redundancy sometimes a cluster may have more than one route reflector. All router reflectors in such a cluster are then identified by a cluster ID. The bgp cluster-id command is used to configure the 4 byte cluster ID for clusters with more than one route reflectors.

## Examples

```
Switch# configure terminal
Switch(config) router bgp 100
Switch(config-router) bgp cluster-id 1.1.1.1
```

### Related Commands

bgp client-to-client reflection, neighbor route-reflector-client, show ip bgp

## 6.7.13 bgp confederation identifier

### Command Purpose

Use this command to specify a Bgp confederation identifier.

Use the no parameter with this command to remove the Bgp confederation identifier.

### Command Syntax

bgp confederation identifier *ID*

no bgp confederation identifier

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ID | Set routing domain confederation AS number | 1-65535 |

### Command Mode

Router Configuration

### Default

N/A

### Usage

N/A

### Examples

```
Switch# configure terminal
Switch(config) router bgp 100
Switch(config-router) bgp confederation identifier 1
```

### Related Commands

bgp confederation peer

## 6.7.14 bgp confederation peers

### Command Purpose

Use this command to configure the Autonomous Systems (AS) that belong to the confederation.

Use the no parameter with this command to remove an autonomous system from the confederation.

### Command Syntax

bgp confederation peers *.ASN*

no bgp confederation peers ( *.ASN* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ASN | AS numbers of eBGP peers that are under same confederation but in a different sub-AS | 1-65535 |

### Command Mode

Router Configuration

### Default

N/A

### Usage

A confederation allows an AS to be divided into several ASs. The AS is given a confederation identifier. External routers view only the whole confederation as one AS. Each AS is fully meshed within itself and is visible internally to the confederation. Use the bgp confederation peer command to define the list of confederation peers.

### Examples

```
Switch# configure terminal
Switch(config) router bgp 100
Switch(config-router) bgp confederation peers 1234 21345
```

### Related Commands

bgp confederation identifier

## 6.7.15 bgp dampening

### Command Purpose

Use this command to set bgp dampening parameters.

Use the no parameter with this command to unset the bgp dampening parameters.

### Command Syntax

bgp dampening *REACHTIME*

bgp dampening *REACHTIME REUSE*

bgp dampening *REACHTIME REUSE SUPPRESS MAXSUPPRESS* ( *UNREACHTIME* | )

bgp dampening route-map *ROUTEMAP*

no bgp dampening *REACHTIME*

no bgp dampening *REACHTIME REUSE*

no bgp dampening *REACHTIME REUSE SUPPRESS MAXSUPPRESS* ( *UNREACHTIME* | )

no bgp dampening route-map ( *ROUTEMAP* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| REACHTIME | Specifies the reachability half-life time in minutes. The time for the penalty to decrease to one-half of its current value. The default is 15 minutes. | 1-45 |

| | | |
|---|---|---|
| REUSE | Specifies the reuse limit value. When the penalty for a suppressed route decays below the reuse value, the routes become unsuppressed. The default reuse limit is 750 SUPPRESS <1-20000> Specifies the suppress limit value. When the penalty for a route exceeds the suppress value, the route is suppressed. The default suppress limit is 2000. | 1-20000 |
| SUPPRESS | Specifies suppress-time.A route dampening more than this value will be suppressd. The default value is 2000. | 1-20000 |
| MAXSUPPRESS | Specifies the max-suppress-time. Maximum time that a dampened route is suppressed. The default max-suppress value is 4 times the half-life time (60 minutes). | 1-255 |
| UNREACHTIME | Specifies the un-reachability half-life time for penalty, in minutes. | 1-45 |
| ROUTEMAP | route-map WORD Route-map to specify criteria for dampening. | Up to 20 characters |

## Command Mode

Router Configuration

Address Family Configuration

## Default

N/A

## Usage

Route dampening minimizes the instability caused by route flapping. A penalty is added for every flap in a flapping route. As soon as the total penalty reaches the

suppress limit the advertisement of the route is suppressed. This penalty is decayed according to the configured half time value. Once the penalty is lower than the reuse limit, the route advertisement is un-suppressed.

The dampening information is purged from the router once the penalty becomes less than half of the reuse limit.

### Examples

```
Switch# configure terminal
Switch(config)# router bgp 100
Switch(config-router)# bgp dampening 20 800 2500 80 25
```

### Related Commands

N/A

## 6.7.16 bgp default ipv4-unicast

### Command Purpose

Use this command to configure BGP defaults and activate ipv4-unicast for a peer by default. This affects the BGP global configuration.

Use the no parameter with this command to disable this function

### Command Syntax

bgp default ipv4-unicast

no bgp default ipv4-unicast

### Command Mode

Router Configuration

### Default

The bgp default ipv4 unicast is the default behavior.

## Usage

The no bgp default ipv4-unicast command is used to disable the default behavior of the BGP routing process of exchanging IPv4 addressing information with BGP neighbor routers.

## Examples

```
Switch# configure terminal
Switch(config) router bgp 100
Switch(config-router) bgp default ipv4-unicast
```

## Related Commands

N/A

# 6.7.17 bgp default local-preference

## Command Purpose

Use this command to change the default local preference value.

Use the no parameter with this command to revert to the default setting.

## Command Syntax

bgp default local-preference *PREF_VALUE*

no default local-preference

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PREF_VALUE | Configure default local preference value. The default local preference value is 100. | 0-4294967295 |

## Command Mode

Router Configuration

## Default

The default local preference value is 100.

### Usage

Local preference indicates the preferred path when there are multiple paths to the same destination. The path having a higher preference is preferred. Use bgp default local-preference command to define preference of a particular path. The preference is sent to all routers and access servers in the local autonomous system.

### Examples

```
Switch# configure terminal
Switch(config) router bgp 100
Switch(config-router) bgp default local-preference 2345555
```

### Related Commands

N/A

## 6.7.18 bgp deterministic-med

### Command Purpose

Use this command to compare the Multi Exit Discriminator (MED) variable when choosing among routes advertised by different peers in the same autonomous system.

Use the no parameter with this command to disallow this setting.

### Command Syntax

bgp deterministic-med

no bgp deterministic-med

### Command Mode

Router Configuration

### Default

Disabled

## Usage

"Multi Exit Discriminator (MED) is used in best path selection by BGP. MED is compared after BGP attributes weight, local preference, AS-path and origin have been compared and are equal. Enable bgp deterministic med command on all routers in the local AS, for a correct comparison result. After enabling this command, all paths for the same prefix are grouped together and arranged according to their MED value.

Based on this comparison, the best path is then chosen.

This command compares MED variable when choosing routes advertised by different peers in the same AS, to compare MED, when choosing routes from neighbors in different ASs use the bgp always-compare-med command."

## Examples

```
Switch# configure terminal
Switch(config) router bgp 100
Switch(config-router) bgp deterministic-med
```

## Related Commands

show ip bgp, show ip bgp neighbors

# 6.7.19 bgp enforce-first-as

## Command Purpose

Use this command to specifies that any updates received from an external neighbor that do not have the neighbor's configured Autonomous System (AS) at the beginning of the AS_PATH in the received update must be denied.

Use the no parameter with this command to disable this feature.

## Command Syntax

bgp enforce-first-as

no bgp enforce-first-as

### Command Mode

Router Configuration

### Default

Disabled

### Usage

Enabling this feature adds to the security of the BGP network by not allowing traffic from unauthorized systems.

### Examples

```
Switch# configure terminal
Switch(config)# router bgp 100
Switch(config-router)# bgp enforce-first-as
```

### Related Commands

N/A

## 6.7.20 bgp fast-external-failover

### Command Purpose

Use this command to reset a BGP session immediately, if the interface used for BGP connection goes down.

Use the no parameter with this command to disable this feature.

### Command Syntax

bgp fast-external-failover

no bgp fast-external-failover

### Command Mode

Router Configuration

### Default

Enabled

### Usage

None

### Examples

```
Switch# configure terminal
Switch(config)# router bgp 100
Switch(config-router)# bgp fast-external-failover
```

### Related Commands

N/A

## 6.7.21 bgp log-neighbor-changes

### Command Purpose

Use this command to enable logging of status change messages without turning on debug bgp commands.

Use the no parameter with this command to disable this feature.

### Command Syntax

bgp log-neighbor-changes

no bgp log-neighbor-changes

### Command Mode

Router Configuration

### Default

Disabled

## Usage

System implementation provides other kinds of logging services for neighbor status, for example, debug bgp fsm, debug bgp events, etc. However, these commands create a significant hit in the logging performance.

The bgp log-neighbor-changes command, logs the following events:

(1)BGP Notification Received

(2)Erroneous BGP Update Received

(3)User reset request

- Peer time-out

(5)Peer Closing down the session

(6)Interface flap

(7)Router ID changed

(8)Neighbor deleted

(9)Member added to peer group

(10)Administrative shutdown

(11)Remote AS changed

(12)RR client configuration modification

(13)Soft reconfiguration modification

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 100
Switch(config-router)# bgp log-neighbor-changes
```

## Related Commands

N/A

# 6.7.22 bgp router-id

## Command Purpose

Use this command to configure the router identifier.

Use the no parameter with this command to disable this function

## Command Syntax

bgp router-id *ROUTERID*

no bgp router-id ( *ROUTERID* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ROUTERID | A.B.C.D Manually configured router ID. | IPv4 Address in A.B.C.D format |

## Command Mode

Router Configuration

Address Family Configuration

## Default

In case the loopback interface is configured the router-id is set to the IP address of a loopback interface. If not, the highest IP address is the router-id.

## Usage

Use bgp router-id command to manually configure a fixed router ID as a BGP router identifier.

## Examples

```
Switch# configure terminal
Switch(config) router bgp 100
Switch(config-router) bgp router-id 1.1.2.3
```

## Related Commands

N/A

# 6.7.23 bgp scan-time

## Command Purpose

Use this command to set the interval for BGP route next-hop scanning.

Use the no parameter with this command to disable this function.

## Command Syntax

bgp scan-time *TIME*

no bgp scan-time

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| TIME | Scanning interval in seconds. The default scanning interval is 60 seconds. | 0-60 |

## Command Mode

Router Configuration

## Default

N/A

## Usage

Use this command to configure scanning intervals of BGP routers. This interval is the period after which router checks the validity of the routes in its database.

To disable BGP scanning, set the scan time interval to 0 seconds.

## Examples

```
Switch# configure terminal
Switch(config) router bgp 100
Switch(config-router) bgp scan-time 10
```

## Related Commands

N/A

# 6.7.24 clear ip bgp *

## Command Purpose

Use this command to reset a BGP connection for all peers.

## Command Syntax

clear ip bgp * ( *IN* | out | *SOFT* | )

clear ip bgp * ipv4 *PREFIX ROUTES*

clear ip bgp * vpnv4 unicast *ROUTES*

clear ip bgp * vrf *NAME ROUTES*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| * | clears all bgp peers | - |
| ipv4 | clears all IPv4 address family peers | - |
| vpnv4 | clears all vpnv4 address family peers | - |
| ROUTES | (IN\|out\|SOFT) | - |
| IN | in (prefix-filter\|) | - |
| in | Indicates that incoming advertised routes will be cleared | - |
| prefix-filter | Pushes out prefix-list ORF and does inbound soft reconfiguration | - |
| out | Indicates that outgoing advertised routes will be cleared. | - |
| SOFT | soft (in\|out\|) Indicates that both incoming and outgoing routes will be cleared | - |
| PREFIX | (unicast\|multicast) | - |
| unicast | address family modifier | - |
| multicast | address family modifier | - |

| | | |
|---|---|---|
| vrf | VPN routing/forwarding instance | - |
| NAME | VPN Routing/Forwarding instance name | Up to 31 characters |

## Command Mode

Privileged EXEC

## Default

N/A

## Usage

There are two kinds BGP reset, hard reset will clear BGP peers and establish again. Soft reset only refresh routing table.

## Examples

```
Switch# clear ip bgp *
Switch# clear ip bgp * ipv4 unicast in prefix-filter
Switch# clear ip bgp * vpnv4 unicast in
```

## Related Commands

N/A

# 6.7.25 clear ip bgp A.B.C.D

## Command Purpose

Use this command to reset a IPv4 BGP connection for a specific IP address.

## Command Syntax

clear ip bgp *A.B.C.D* ( in | out | *SOFT* )

clear ip bgp *A.B.C.D* ipv4 *PREFIX ROUTES*

clear ip bgp *A.B.C.D* vpnv4 unicast *ROUTES*

clear ip bgp *A.B.C.D* vrf *NAME ROUTES*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| A.B.C.D | Specifies the IPv4 address of the BGP route to be cleared | IPv4 Address in A.B.C.D format |
| ipv4 | clears all IPv4 address family peers | - |
| vpnv4 | clears all VPNv4 address family peers | - |
| ROUTES | (IN\|out\|SOFT) | - |
| IN | in prefix-filter | - |
| in | Indicates that incoming advertised routes will be cleared | - |
| prefix-filter | Pushes out prefix-list ORF and does inbound soft reconfiguration | - |
| out | Indicates that outgoing advertised routes will be cleared. | - |
| SOFT | soft (in\|out\|) Indicates that both incoming and outgoing routes will be cleared | - |
| PREFIX | (unicast\|multicast) | - |
| unicast | address family modifier | - |
| multicast | address family modifier | - |
| vrf | VPN routing/forwarding instance | - |
| NAME | VPN Routing/Forwarding instance name | Up to 31 characters |

## Command Mode

Privileged EXEC

## Default

N/A

## Usage

N/A

## Examples

```
Switch# clear ip bgp 10.10.0.12 soft
Switch# clear ip bgp 10.10.0.10 vpnv4 unicast out
Switch# clear ip bgp 11.11.11.11 ipv4 multicast in prefix-filter
```

## Related Commands

N/A

# 6.7.26 clear ip bgp dampening

## Command Purpose

Use this command to reset all dampened BGP routes under the specified address family.

## Command Syntax

clear ip bgp dampening ( *A.B.C.D* | *A.B.C.D/M* | )

clear ip bgp ipv4 *PREFIX* dampening ( *A.B.C.D* | *A.B.C.D/M* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| A.B.C.D | Specifies the IPv4 address for which Bgp dampening is to be cleared. | IPv4 Address in A.B.C.D format |
| A.B.C.D/M | Specifies the IPv4 address with mask for which Bgp dampening is to be cleared. | IPv4 Address and mask length in A.B.C.D/M format |
| ipv4 | clears all IPv4 address family peers | - |
| PREFIX | (unicast\|multicast) | - |
| unicast | address family modifier | - |
| multicast | address family modifier | - |

## Command Mode

Privileged EXEC

## Default

N/A

## Usage

N/A

## Examples

```
Switch# clear ip bgp dampening 10.10.0.121
Switch# clear ip bgp ipv4 unicast dampening
```

## Related Commands

N/A

# 6.7.27 clear ip bgp flap-statistics

## Command Purpose

Use this command to clear the flap count and history duration for all the prefixes under the specified address family.

## Command Syntax

clear ip bgp flap-statistics ( *A.B.C.D* | *A.B.C.D/M* | )

clear ip bgp ipv4 *PREFIX* flap-statistics ( *A.B.C.D* | *A.B.C.D/M* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| A.B.C.D | Specifies the IPv4 address for which Bgp dampening is to be cleared. | IPv4 Address in A.B.C.D format |
| A.B.C.D/M | Specifies the IPv4 address with mask for which Bgp dampening is to be cleared. | IPv4 Address and mask length in A.B.C.D/M format |
| ipv4 | clears all IPv4 address family peers | - |
| PREFIX | (unicast\|multicast) | - |
| unicast | address family modifier | - |
| multicast | address family modifier | - |

### Command Mode

Privileged EXEC

### Default

N/A

### Usage

N/A

### Examples

```
Switch# clear ip bgp flap-statistics 10.10.0.121
Switch# clear ip bgp ipv4 unicast flap-statistics
```

### Related Commands

N/A

## 6.7.28 clear ip bgp ASN

### Command Purpose

Use this command to reset a BGP connection for all peers in a specified Autonomous System.

### Command Syntax

clear ip bgp *ASN* ( *IN* | out | *SOFT* | )

clear ip bgp *ASN* ipv4 *PREFIX ROUTES*

clear ip bgp *ASN* vpnv4 unicast *ROUTES*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ASN | Specifies the AS Number for which all routes will be cleared | 1-65535 |
| ipv4 | clears all IPv4 address family peers | - |

| | | |
|---|---|---|
| vpnv4 | clears all VPNv4 address family peers | - |
| ROUTES | (IN\|out\|SOFT) | - |
| IN | in prefix-filter | - |
| in | Indicates that incoming advertised routes will be cleared | - |
| out | Indicates that outgoing advertised routes will be cleared. | - |
| prefix-filter | Pushes out prefix-list ORF and does inbound soft reconfiguration | - |
| SOFT | soft (in\|out\|) Indicates that both incoming and outgoing routes will be cleared | - |
| PREFIX | (unicast\|multicast) | - |
| unicast | address family modifier | - |
| multicast | address family modifier | - |

## Command Mode

Privileged EXEC

## Default

N/A

## Usage

N/A

## Examples

```
Switch# clear ip bgp 100
Switch# clear ip bgp 200 ipv4 unicast in prefix-filter
Switch# clear ip bgp 500 vpnv4 unicast in
```

## Related Commands

N/A

# 6.7.29 clear ip bgp external

## Command Purpose

Use this command to reset a BGP connection for all external peers.

## Command Syntax

clear ip bgp external ( *In* | out | *SOFT* | )

clear ip bgp external ipv4 *PREFIX ROUTES*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| external | Clears all external peers | - |
| ROUTES | (IN\|out\|SOFT) | - |
| IN | in prefix-filter | - |
| in | Indicates that incoming advertised routes will be cleared | - |
| out | Indicates that outgoing advertised routes will be cleared. | - |
| SOFT | soft (in\|out\|) Indicates that both incoming and outgoing routes will be cleared | - |
| ipv4 | clears all IPv4 address family peers | - |
| PREFIX | (unicast\|multicast) | - |
| unicast | address family modifier | - |
| multicast | address family modifier | - |

## Command Mode

Privileged EXEC

## Default

N/A

## Usage

N/A

## Examples

```
Switch# clear ip bgp external out
Switch# clear ip bgp external ipv4 unicast in prefix-filter
```

## Related Commands

N/A

# 6.7.30 clear ip bgp peer-group

## Command Purpose

Use this command to reset a BGP connection for all members of a peer group.

## Command Syntax

clear ip bgp peer-group *WORD* ( *In* | out | *SOFT* | )

clear ip bgp peer-group *WORD* ipv4 *PREFIX ROUTES*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| peer-group | Clears all members of a peer group | - |
| WORD | Specifies the name of the peer group for which all members will be cleared. | Up to 20 characters |
| ipv4 | clears all IPv4 address family peers | - |
| ROUTES | (IN\|out\|SOFT) | - |
| prefix-filter | Pushes out prefix-list ORF and does inbound soft reconfiguration | - |
| IN | in prefix-filter | - |
| in | Indicates that incoming advertised routes will be cleared | - |
| prefix-filter | Pushes out prefix-list ORF and does inbound soft reconfiguration | - |

| | | |
|---|---|---|
| out | Indicates that outgoing advertised routes will be cleared. | - |
| SOFT | soft (in\|out\|) Indicates that both incoming and outgoing routes will be cleared | - |
| PREFIX | (unicast\|multicast) | - |
| unicast | address family modifier | - |
| multicast | address family modifier | - |

### Command Mode

Privileged EXEC

### Default

N/A

### Usage

None

### Examples

```
Switch# clear ip bgp peer-group Peer1 out
Switch# clear ip bgp peer-group mypeer ipv4 unicast in prefix-filter
```

### Related Commands

N/A

## 6.7.31 clear ip bgp vrf

### Command Purpose

Use this command to reset the specified VPN Routing /Forwarding Instance for BGP connections.

### Command Syntax

clear ip bgp ( *A.B.C.D* ) | * ) vrf *WORD* ( out | in | *SOFT* )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| WORD | Specifies the name of the VRF | Up to 31 characters |
| A.B.C.D | Specifies the IPv4 address of the BGP route to be cleared | IPv4 Address in A.B.C.D format |
| * | Clears all peers | - |
| out | Performs soft reconfiguration out | - |
| SOFT | soft (in\|out\|) Indicates that both incoming and outgoing routes will be cleared | - |
| in | Performs soft reconfiguration in | - |

## Command Mode

Privileged EXEC

## Default

N/A

## Usage

If the neighbor address is specified with this command it clears the specified connection. If no address is specified this command clears all the BGP routes.

## Examples

```
Switch# clear ip bgp 3.3.3.3 vrf VRF1 soft in
```

## Related Commands

N/A

# 6.7.32 debug bgp

## Command Purpose

Use this command to specify all debugging options for BGP. Use the no parameter with this command to disable this function.

## Command Syntax

debug bgp ( all | dampening | events | filters | fsm | keepalives | mpls | updates )

no debug bgp ( all | dampening | events | filters | fsm | keepalives | mpls | nsm | updates )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| all | Used with the no form exclusively; turns off all debugging for BGP | - |
| dampening | Specifies debugging for Bgp dampening. | - |
| events | Specifies debugging for BGP events. | - |
| filters | Specifies debugging for BGP filters. | - |
| fsm | Specifies debugging for BGP Finite State Machine (FSM). | - |
| mpls | Specifies debuggin for BGP Multiprotocol Label Switching. | - |
| keepalives | Specifies debugging for BGP keepalives. | - |
| updates | updates Specifies debugging for BGP updates. | - |

## Command Mode

Privileged EXEC

## Default

N/A

### Usage

This command without any parameters turns on normal bgp debug information.

### Examples

```
Switch# debug bgp
Switch# debug bgp events
```

### Related Commands

N/A

## 6.7.33 default-information originate

### Command Purpose

Use this command to distribute default route between neighbors.

Use the no parameter with this command to disable the distributing of default route.

### Command Syntax

default-information originate

no default-information originate

### Command Mode

Router Configuration

### Default

In the default case, BGP will not distribute the default route to neighbors.

### Usage

When the swtich has default route, using this command will distribute default route to BGP neighbors.

In the default case, BGP will not distribute default route.

### Examples

```
Switch# configure terminal
Switch(config)# router bgp 100
Switch(config-router)# default-information originate
```

### Related Commands

N/A

## 6.7.34 distance

### Command Purpose

Use this command to define an administrative distance.

Use the no parameter with this command to remove an administrative distance.

### Command Syntax

distance *ADMINDISTANCE IP_ADDR/IP_MASK_LEN*

no distance *ADMINDISTANCE IP_ADDR/IP_MASK_LEN*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ADMINDISTANCE | Specifies the administrative distance. | 1-255 |
| IP_ADDR | the IP source prefix | IPv4 Address |
| IP_MASK_LEN | the IP source prefix mask length | 1-32 |

### Command Mode

Router Configuration

### Default

N/A

### Usage

Use this command to set the administrative distance for BGP. This distance is a rating of trustworthiness of a router.

The higher the distance the lower the trust rating.

The administrative distance can be set for external, internal and local routes. External paths are routes learned from a neighbor out of the AS. The internal routes are routes learned from another router within the same AS. Local routes are for the router that is being redistributed from another process.

If the administrative distance is changed, it could create inconsistency in the routing table and obstruct routing.

### Examples

```
Switch# configure terminal
Switch(config) router bgp 100
Switch(config-router) distance 34 10.10.0.0/24 mylist
Switch# configure terminal
Switch(config) router bgp 100
Switch(config-router) distance bgp 34 23 15
```

### Related Commands

N/A

## 6.7.35 exit-address-family

### Command Purpose

Use this command to exit the address family mode.

### Command Syntax

exit-address-family

### Command Mode

Address Family Configuration

### Default

N/A

## Usage

N/A

## Examples

The following example shows the use of exit-address-family command and the change in the prompt after using this command:

```
Switch# configure terminal
Switch(config)# router bgp 100
Switch(config-router)# address-family ipv4 unicast
Switch(config-router-af)# exit-address-family
Switch(config-router)#
```

## Related Commands

address-family

# 6.7.36 ip as-path access-list

## Command Purpose

Use this command to define a BGP Autonomous System (AS) path access list.

Use the no parameter with this command to disable use of the access list.

## Command Syntax

ip as-path access-list *LISTNAME* ( deny | permit ) *LINE*

no ip as-path access-list *LISTNAME* ( deny | permit ) *LINE*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LISTNAME | Specifies the name of the access list. | Up to 40 characters, the first character must be among [a-zA-Z0-9] |
| deny | (Optional) Denies access to matching conditions. | - |
| permit | (Optional) Permits access to matching conditions. | - |
| LINE | Specifies a regular expression to match the BGP AS paths. | A regular expression to match the BGP AS paths |

### Command Mode

Global Configuration

### Default

N/A

### Usage

Named community list is a filter based on regular expressions. If the regular expression matches the specified string representing the AS path of the route, then the permit or deny condition applies. Use this command to define the BGP access list globally, use the neighbor router configuration command to apply a specific access list.

### Examples

```
Switch# configure terminal
Switch(config)# ip as-path access-list mylist deny ^65535$
```

### Related Commands

N/A

## 6.7.37 ip community-list

### Command Purpose

Use this command to add a community list entry.

Use the no parameter with this command to delete the community list entry.

### Command Syntax

ip community-list *LISTNUM* ( deny | permit ) *COMMUNITY*

no ip community-list *LISTNUM* ( deny | permit ) *COMMUNITY*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LISTNUM | Specifies the community ID.<br>1-99:Standard list<br>100-199:Expandes list | 1-199 |
| deny | Specifies the community to reject. | - |
| permit | Specifies the community to accept. | - |
| COMMUNITY | (AA:NN\|internet\|local-AS\|no-advertise\|no-export) | - |
| AA:NN | Specifies the valid value for the community number. This format represents the 32 bit communities value, where AS is the high order 16 bits and VAL is the low order 16 bits in digit format. | AA is in the range 1-65535 NN is in the range of 1-65535 |
| internet | Specifies routes not to be advertised to the Internet. | - |
| local-AS | Specifies routes not to be advertised to external BGP peers. | - |
| no-advertise | Specifies routes not to be advertised to other BGP peers. | - |
| no-export | Specifies routes not to be advertised outside of Autonomous System boundary. | - |

## Command Mode

Global Configuration

## Default

N/A

## Usage

Use the community-lists to specify BGP community attributes. The community attribute is used for implementing policy routing. It is an optional, transitive

attribute and facilitates transfer of local policies through different autonomous systems. It includes community values that are 32 bits long.

There are two kinds of community-lists: the expanded and standard. The standard community-list defines the community attributes in a specified format and not with regular expressions. The expanded community-list defines the communities attributes with regular expressions.

### Examples

```
Switch# configure terminal
Switch(config)# ip community-list 20 permit 7675:80 7675:90
```

### Related Commands

ip community-list standard

ip community-list expanded

## 6.7.38 ip community-list expanded

### Command Purpose

Use this command to add a community list entry.

Use the no parameter with this command to delete the community list entry.

### Command Syntax

ip community-list expanded *WORD* ( deny | permit ) *LINE*

no ip community-list expanded *WORD* ( deny | permit ) *LINE*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| expanded | Add an expanded community-list entry. | - |
| WORD | Expanded community list name | Up to 20 characters |
| deny | Specifies community to reject. | - |
| permit | Specifies community to accept. | - |

| | | |
|---|---|---|
| LINE | Specifies a regular expression to match the BGP AS paths. | A regular expression |

## Command Mode

Global Configuration

## Default

N/A

## Usage

Use the community-lists to specify BGP community attributes. The community attribute is used for implementing policy routing. It is an optional, transitive attribute and facilitates transfer of local policies through different autonomous systems. It includes community values that are 32 bits long.

There are two kinds of community-lists-the expanded and standard. The standard community-list defines the community attributes in a specified format and not with regular expressions. The expanded community-list defines the communities attributes with regular expressions.

## Examples

```
Switch# configure terminal
Switch(config)# ip community-list expanded CLIST permit .*
```

## Related Commands

ip community-list

ip community-list standard

# 6.7.39 ip community-list standard

## Command Purpose

Use this command to add a standard community-list entry.

Use the no parameter with this command to delete the standard community-list entry.

## Command Syntax

ip community-list standard *WORD* ( deny | permit ) *COMMUNITY*

no ip community-list standard *WORD* ( deny | permit ) *COMMUNITY*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| standard | Specifies a standard community list. | - |
| WORD | Standard community list name | Up to 20 characters |
| deny | Specifies community to reject. | - |
| permit | Specifies community to accept. | - |
| COMMUNITY | (AA:NN\|internet\|local-AS\|no-advertise\|no-export) | - |
| AA: NN | Specifies the valid value for the community number. This format represents the 32 bit communities value, where AS is the high order 16 bits and VAL is the low order 16 bits in digit<br>Specifies the valid value for the community number. This format represents the 32 bit communities value, where AS is the high order 16 bits and VAL is the low order 16 bits in digit format. | AA is in the range 1-65535<br>NN is in the range of 1-65535 |
| internet | Specifies routes not to be advertised to the Internet. | - |
| local-AS | Specifies routes not to be advertised to external BGP peers. | - |
| no-advertise | Specifies routes not to be advertised to other BGP peers. | - |

| | | |
|---|---|---|
| no-export | Specifies routes not to be advertised outside of the Autonomous System boundary. | - |

## Command Mode

Global Configuration

## Default

N/A

## Usage

Use the community-lists to specify BGP community attributes. The community attribute is used for implementing policy routing. It is an optional, transitive attribute and facilitates transfer of local policies through different autonomous systems. It includes community values that are 32 bits long.

There are two kinds of community-lists-the expanded and standard. The standard community-list defines the community attributes in a specified format without regular expressions. The expanded community-list defines the communities attributes with regular expressions.

Use the ip community-list standard command to add a standard community-list entry. The standard community-list is compiled into binary format and is directly compared with the BGP communities attribute in the BGP updates. The comparison is faster than the expanded community-list. Any community value that does not match the standard community value is automatically treated as expanded.

## Examples

```
Switch# configure terminal
Switch(config)# ip community-list standard CLIST permit 7675:80 7675:90 no-export
```

## Related Commands

ip community-list

ip community-list expanded

# 6.7.40 neighbor activate

## Command Purpose

Use this command to enable the exchange of the specified AF routes with a neighboring router.

Use the no parameter with this command to disable exchange of information with a neighbor.

## Command Syntax

neighbor *NEIGHBORID* activate

no neighbor *NEIGHBORID* activate

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (A.B.C.D\|TAG) | - |
| A.B.C.D | Specifies the address of the BGP neighbor in IPv4 format. | IPv4 Address in A.B.C.D format |
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |

## Command Mode

Router Configuration

Address Family Configuration

## Default

N/A

### Usage

After the TCP connection is opened with the neighbor, this command is used to enable or disable the exchange of the specified AF information with a neighboring router.

To enable the exchange of multicast and VPNv4 address prefix types, neighbors are activated using the neighbor activate command in address family mode.

### Examples

```
Switch# configure terminal
Switch(config)# router bgp 10
Switch(config-router)# neighbor 1.2.3.4 activate
```

### Related Commands

neighbor remote-as

## 6.7.41 neighbor advertisement-interval

### Command Purpose

Use this command to set the minimum interval between sending the BGP routing updates.

Use the no parameter with this command to set the interval time to default.

### Command Syntax

neighbor *NEIGHBORID* advertisement-interval *TIME*

no neighbor *NEIGHBORID* advertisement-interval

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (A.B.C.D\|TAG) | - |
| A.B.C.D | Specifies the address of the BGP neighbor in IPv4 format. | IPv4 Address in A.B.C.D format |

| | | |
|---|---|---|
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |
| TIME | Advertise -interval value in seconds | 0-600 |

## Command Mode

Router Configuration

## Default

N/A

## Usage

Use this command to set the minimum interval between the sending of BGP routing updates. To reduce the flapping of routes to internet, a minimum advertisement interval is set, so that the BGP routing updates are sent only per interval seconds. bgp dampening can also be used to control the effects of flapping routes. For the originated bgp routes， they would be sent out when as-origination-interval and advertisement-interval expired at the same time.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 10
Switch(config-router)# neighbor 10.10.0.3 advertisement-interval 45
```

## Related Commands

N/A

# 6.7.42 neighbor as-origination-interval

## Command Purpose

Use this command to set the minimum interval between ready to send the originated BGP routing updates.

Use the no parameter with this command to set the interval time to default.

## Command Syntax

neighbor *NEIGHBORID* as-origination-interval *TIME*

no neighbor *NEIGHBORID* as-origination-interval *TIME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (A.B.C.D\|TAG) | - |
| A.B.C.D | Specifies the address of the BGP neighbor in IPv4 format. | IPv4 Address in A.B.C.D format |
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |
| TIME | Advertise -interval value in seconds | 0-600 |

## Command Mode

Router Configuration

## Default

N/A

## Usage

Use this command to set the minimum interval between the ready to send of originated BGP routing updates. For the originated bgp routes， they would be sent out when as-origination-interval and advertisement-interval expired at the same time.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 10
Switch(config-router)# neighbor 10.10.0.3 advertisement-interval 45
```

## Related Commands

N/A

# 6.7.43 neighbor allowas-in

## Command Purpose

Use this command to configure PE routers to allow re-advertisement of all prefixes containing duplicate Autonomous System Numbers (ASNs).

Use the no parameter with this command to disable the readvertisement of a PE router's ASN.

## Command Syntax

neighbor *NEIGHBOR* allowas-in [ *NUMBER* ]

no neighbor *NEIGHBOR* allowas-in

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (A.B.C.D\|TAG) | - |
| A.B.C.D | Specifies the address of the BGP neighbor in IPv4 format. | IPv4 Address in A.B.C.D format |

| | | |
|---|---|---|
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |
| NUMBER | Number of occurances of AS number.Default value is 1 | 1-10 |

## Command Mode

Router Configuration

Address Family Configuration

## Default

Disabled

## Usage

In a hub and spoke configuration, a PE router re-advertises all prefixes containing duplicate ASNs. Use the neighbor allowas-in command to configure two VRFs on each PE router to receive and re-advertise prefixes. One of the VRFs receives prefixes with ASNs from all PE routers and then advertises them to neighboring PE routers. The other VRF receives prefixes with ASNs from the CE router and re-advertises them to all PE routers in the hub and spoke configuration.

Control the number of times an ASN is advertised, by specifying a number from 1 to 10.

## Examples

```
Switch# configure terminal
Switch(config-router)# address-family ipv4 vrf VRF_A
Switch(config-router-af)# neighbor 10.10.0.1 allowas-in 3
```

## Related Commands

N/A

# 6.7.44 neighbor attribute-unchanged

## Command Purpose

Use this command to advertise unchanged BGP attributes to the specified neighbor.

Use the no parameter with this command to disable this function.

## Command Syntax

neighbor *NEIGHBORID* attribute-unchanged { as-path | next-hop | med }

no neighbor *NEIGHBORID* attribute-unchanged { as-path | next-hop | med }

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (A.B.C.D\|TAG) | - |
| A.B.C.D | Specifies the address of the BGP neighbor in IPv4 format. | IPv4 Address in A.B.C.D format |
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |
| as-path | AS path attribute | - |
| next-hop | Next hop attribute | - |
| med | Multi Exit Discriminator | - |

## Command Mode

Router Configuration

Address Family Configuration

## Default

N/A

## Usage

N/A

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 10
Switch(config-router)# neighbor 10.10.0.75 attribute-unchanged as-path med
```

## Related Commands

N/A

# 6.7.45 neighbor capability graceful-restart

## Command Purpose

Use this command to enable or disable GR helper capability for the specified neighbors.

Use the no parameter with this command to delete the configure

## Command Syntax

neighbor *NEIGHBORID* capability graceful-restart ( | disable )

no neighbor *NEIGHBORID* capability graceful-restart ( | disable )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (A.B.C.D\|TAG) | - |
| A.B.C.D | Specifies the address of the BGP neighbor in IPv4 format. | IPv4 Address in A.B.C.D format |

| | | |
|---|---|---|
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |

## Command Mode

Router Configuration

## Default

N/A

## Usage

The GR enable status configured based on neighbor with higher priority than configured globally.

The no command with disable will remove the configuration of neighbor gr disable.

The no command without disable will remove the configuration of neighbor gr disable and enable.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 10
Switch(config-router)# neighbor 10.10.10.1 capability graceful-restart
```

## Related Commands

N/A

# 6.7.46 neighbor capability orf prefix-list

## Command Purpose

Use this command to advertise ORF capability to neighbors.

Use the no parameter with this command to disable this function.

## Command Syntax

neighbor *NEIGHBORID* capability orf prefix-list ( both | receive | send )

no neighbor *NEIGHBORID* capability orf prefix-list ( both | receive | send )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (A.B.C.D\|TAG) | - |
| A.B.C.D | Specifies the address of the BGP neighbor in IPv4 format. | IPv4 Address in A.B.C.D format |
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |
| orf | Advertises ORF capability to its neighbors | - |
| both | Indicates that the local router can send ORF entries to its peer as well as receive ORF entries from its peer. | - |
| receive | Indicates that the local router is willing to receive ORF entries from its peer | - |
| send | Indicates that the local router is willing to send ORF entries to its peer | - |

### Command Mode

Router Configuration

Address Family Configuration

### Default

N/A

### Usage

Outbound Route Filters (ORFs) send and receive capabilities to lessen the number of updates exchanged between neighbors. By filtering updates, this option minimizes generating and processing of updates.

The local router advertises the ORF capability in send mode and the remote router receives the ORF capability in receive mode applying the filter as outbound policy. The two routers exchange updates to maintain the ORF for each

### Examples

```
Switch# configure terminal
Switch(config)# router bgp 10
Switch(config-router)# neighbor 1.1.1.1 capability orf prefix-list both
```

### Related Commands

N/A

## 6.7.47 neighbor capability route-refresh

### Command Purpose

Use this command to advertise route-refresh capability to the specified neighbors.

Use the no parameter with this command to disable this function

### Command Syntax

neighbor *NEIGHBORID* capability route-refresh

no neighbor *NEIGHBORID* capability route-refresh

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (A.B.C.D\|TAG) | - |
| A.B.C.D | Specifies the address of the BGP neighbor in IPv4 format. | IPv4 Address in A.B.C.D format |
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |

## Command Mode

Router Configuration

## Default

N/A

## Usage

Use this command to advertise to peer about route refresh capability support. If route refresh capability is supported, then router can dynamically request that the peer readvertises its Adj-RIB-Out.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 10
Switch(config-router)# neighbor 10.10.10.1 capability route-refresh
```

## Related Commands

N/A

# 6.7.48 neighbor default-originate

## Command Purpose

Use this command to allow a BGP local router to send the default route 0.0.0.0 to a neighbor for use as a default route.

Use the no parameter with this command to send no route as a default.

## Command Syntax

neighbor *NEIGHBORID* default-originate ( *ROUTEMAP* | )

no neighbor *NEIGHBORID* default-originate ( *ROUTEMAP* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (A.B.C.D\|TAG) | - |
| A.B.C.D | Specifies the address of the BGP neighbor in IPv4 format. | IPv4 Address in A.B.C.D format |
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |
| ROUTEMAP | route-map WORD | - |
| route-map | The route-map to specify criteria to originate default routes | - |
| WORD | Route-map name | Up to 20 characters |

## Command Mode

Router Configuration

Address Family Configuration

### Default

N/A

### Usage

Every router should have a default route, it is used to send datas to the network which is not existent in local RIB. To set a default route on each router can make every router have a default route, or to create a default route and broadcast it to BGP peer by this command.

### Examples

```
Switch# configure terminal
Switch(config)# router bgp 10
Switch(config-router)# neighbor 10.10.10.1 default-originate route-map myroute
```

### Related Commands

N/A

## 6.7.49 neighbor description

### Command Purpose

Use this command to associate a description with a neighbor.

Use the no parameter with this command to remove the description.

### Command Syntax

neighbor *NEIGHBORID* description *LINE*

no neighbor *NEIGHBORID* description

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (A.B.C.D\|TAG) | - |
| A.B.C.D | Specifies the address of the BGP neighbor in IPv4 format. | IPv4 Address in A.B.C.D format |

| | | |
|---|---|---|
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |
| LINE | A string to describing the neighbor. | Up to 80 characters |

## Command Mode

Router Configuration

Address Family Configuration

## Default

N/A

## Usage

None

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 10
Switch(config-router)# neighbor 1.2.3.4 description Backup router for sales.
```

## Related Commands

N/A

# 6.7.50 neighbor distribute-list

## Command Purpose

Use this command to filter route update from a particular BGP neighbor.

Use the no parameter with this command to remove an entry.

## Command Syntax

neighbor *NEIGHBORID* distribute-list *WORD* ( in | out )

no neighbor *NEIGHBORID* distribute-list *WORD* ( in | out )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (A.B.C.D\|TAG) | - |
| A.B.C.D | Specifies the address of the BGP neighbor in IPv4 format. | IPv4 Address in A.B.C.D format |
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |
| WORD | The name of IP access-list | Up to 40 characters |
| in | Indicates that incoming advertised routes will be filtered. | - |
| out | Indicates that outgoing advertised routes will be filtered. | - |

## Command Mode

Router Configuration

Address Family Configuration

## Default

N/A

## Usage

Use only one distribute-list per BGP neighbor.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 10
Switch(config-router)# neighbor 1.2.3.4 distribute-list mylist out
```

## Related Commands

N/A

# 6.7.51 neighbor ebgp-multihop

## Command Purpose

Use this command to accept and attempt BGP connections to external peers on indirectly connected networks.

Use the no parameter with this command to return to the default.

## Command Syntax

neighbor *NEIGHBORID* ebgp-multihop ( *COUNT* | )

no neighbor *NEIGHBORID* ebgp-multihop

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (A.B.C.D\|TAG) | - |
| A.B.C.D | Specifies the address of the BGP neighbor in IPv4 format. | IPv4 Address in A.B.C.D format |
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |
| COUNT | Maximum hop count. If the maximum hop count is not set the hop count is 255. | 1-255 |

### Command Mode

Router Configuration

### Default

N/A

### Usage

Multihop is not established if the only route to the multihop peer is a default route. This avoids loop formation.

### Examples

```
Switch# configure terminal
Switch(config)# router bgp 10
Switch(config-router)# neighbor 10.10.10.34 remote-as 20
Switch(config-router)# neighbor 10.10.10.34 ebgp-multihop 5
```

### Related Commands

N/A

## 6.7.52 neighbor filter-list

### Command Purpose

Use this command to set up a BGP filter.

Use the no parameter with this command to disable this function.

### Command Syntax

neighbor *NEIGHBORID* filter-list *LISTNAME* ( in | out )

no neighbor *NEIGHBORID* filter-list *LISTNAME* ( in | out )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (A.B.C.D\|TAG) | - |
| A.B.C.D | Specifies the address of the BGP neighbor in IPv4 format. | IPv4 Address in A.B.C.D format |

| | | |
|---|---|---|
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to theneighbor peer-group and neighbor remote-as commands. When this parameter is usedwith a command, the command applies on all peers in the specified group. | Up to 20 characters |
| in | Indicates that incoming advertised routes will be filtered. | - |
| out | Indicates that outgoing advertised routes will be filtered. | - |
| LISTNAME | The name of an autonomous system path access list. | Up to 40 characters |

## Command Mode

Router Configuration

Address Family Configuration

## Default

N/A

## Usage

This command specifies an access list filter on updates based on the BGP autonomous system paths. Each filter is an access list based on regular expressions.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 10
Switch(config-router)# neighbor 10.10.0.34 filter-list listname out
```

## Related Commands

N/A

# 6.7.53 neighbor maximum-prefix

## Command Purpose

Use this command to control the number of prefixes that can be received from a neighbor.

Use the no parameter with this command to disable this function.

## Command Syntax

neighbor *NEIGHBORID* maximum-prefix *MAXIMUM*

no neighbor *NEIGHBORID* maximum-prefix

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (A.B.C.D\|TAG) | - |
| A.B.C.D | Specifies the address of the BGP neighbor in IPv4 format. | IPv4 Address in A.B.C.D format |
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |
| MAXIMUM | MAXPREFIX (THRESHOLD\|) (warning-only\|) | - |
| MAXPREFIX | Specifies the maximum number of prefixes permitted. | 1-4294967295 |
| THRESHOLD | <1-100> Specifies the threshold value, 1 to 100 percent. | 1-100 |
| warning-only | Only gives a warning message when the limit is exceeded. | - |

## Command Mode

Router Configuration

Address Family Configuration

## Default

N/A

## Usage

The neighbor maximum-prefix command allows the configuration of a specified number of prefixes that a BGP router is allowed to receive from a neighbor. When the warning-only option is not used, if any extra prefixes are received, the router ends the peering. A terminated peer, stays down until the clear ip bgp command is used.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 10
Switch(config-router)# neighbor 10.10.0.72 maximum-prefix 1244 warning-only
```

## Related Commands

N/A

# 6.7.54 neighbor next-hop-self

## Command Purpose

Use this command to configure the router as the next hop for a BGP-speaking neighbor or peer group.

Use the no parameter with this command to disable this feature.

## Command Syntax

neighbor [ *NEIGHBORID* | *all* ] next-hop-self

no neighbor *NEIGHBORID* next-hop-self

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (A.B.C.D\|TAG) | - |

| | | |
|---|---|---|
| A.B.C.D | Specifies the address of the BGP neighbor in IPv4 format. | IPv4 Address in A.B.C.D format |
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |

## Command Mode

Router Configuration

Address Family Configuration

## Default

N/A

## Usage

This command allows a BGP router to change the nexthop information that is sent to the iBGP peer. The nexthop information is set to the IP address of the interface used to communicate with the neighbor.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 10
Switch(config-router)# neighbor 10.10.0.72 remote-as 100
Switch(config-router)# neighbor 10.10.0.72 next-hop-self
```

## Related Commands

N/A

# 6.7.55 neighbor override-capability

## Command Purpose

Use this command to override a capability negotiation result.

Use the no parameter with this command to disable this function

## Command Syntax

neighbor *NEIGHBORID* override-capability

no neighbor *NEIGHBORID* override-capability

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (A.B.C.D\|TAG) | - |
| A.B.C.D | Specifies the address of the BGP neighbor in IPv4 format. | IPv4 Address in A.B.C.D format |
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |

## Command Mode

Router Configuration

## Default

N/A

## Usage

None

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 12
Switch(config-router)# neighbor 10.10.10.10 override-capability
```

## Related Commands

N/A

# 6.7.56 neighbor passive

## Command Purpose

Use this command to set a BGP neighbor as passive.

Use the no parameter with this command to disable this function

## Command Syntax

neighbor *NEIGHBORID* passive

no neighbor *NEIGHBORID* passive

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (A.B.C.D\|TAG) | - |
| A.B.C.D | Specifies the address of the BGP neighbor in IPv4 format. | IPv4 Address in A.B.C.D format |
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |

## Command Mode

Router Configuration

## Default

N/A

## Usage

N/A

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 12
Switch(config-router)# neighbor 10.10.10.10 passive
```

## Related Commands

N/A

# 6.7.57 neighbor peer-group (adding a neighbor)

## Command Purpose

Use this command to add a neighbor to an existing peer-group.

Use the no parameter with this command to disable this function.

## Command Syntax

neighbor *IPADDRESS* peer-group *TAG*

no neighbor *IPADDRESS* peer-group

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IPADDRESS | A.B.C.D Specifies the address of the BGP neighbor in IPv4 format.<br>A.B.C.D Specifies the address of the BGP neighbor in IPv4 format.<br>TAG Name of the peer-group | IPv4 Address in A.B.C.D format |

| | | |
|---|---|---|
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |

## Command Mode

Router Configuration

## Default

N/A

## Usage

Use this command to Neighbors with the same update policies are grouped into peer groups. This facilitates the updates of various policies, such as, distribute and filter lists. The peer-group is then configured easily with any of the neighbor commands. Any changes made to the peer group affect all members.

To create a peer-group use the neighbor peer-group create command and then use this command to add neighbors to the group.

## Examples

This example shows a new peer-group group1 and the adding of a neighbor 10.10.0.63 to the group:

```
Switch# configure terminal
Switch(config)# router bgp 10
Switch(config-router)# neighbor group1 peer-group
Switch(config-router)# neighbor 10.10.0.63 peer-group group1
```

## Related Commands

N/A

# 6.7.58 neighbor peer-group (creating a peer-group)

## Command Purpose

Use this command to create a peer-group.

Use the no parameter with this command to disable this function

## Command Syntax

neighbor *TAG* peer-group

no neighbor *TAG* peer-group

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| TAG | Name of the peer-group | - |

## Command Mode

Router Configuration

## Default

N/A

## Usage

Neighbors with the same update policies are grouped into peer groups. This facilitates the updates of various policies, such as, distribute and filter lists. The peer-group is then configured easily with any of the neighbor commands. Any changes made to the peer group affect all members. Use this command to create a peer-group.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 10
Switch(config-router)# neighbor group1 peer-group
```

## Related Commands

N/A

# 6.7.59 neighbor prefix-list

## Command Purpose

Use this command to distribute BGP neighbor information as specified in a prefix list.

Use the no parameter with this command to remove an entry.

## Command Syntax

neighbor *NEIGHBORID* prefix-list *LISTNAME* ( in | out )

no neighbor *NEIGHBORID* prefix-list *LISTNAME* ( in | out )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (A.B.C.D\|TAG) | - |
| A.B.C.D | Specifies the address of the BGP neighbor in IPv4 format. | IPv4 Address in A.B.C.D format |
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |
| LISTNAME | The number of an AS-path access list. | Up to 40 characters |
| in | Specifies that the access list applies to incoming advertisements. | - |
| out | Specifies that the access list applies to outgoing advertisements. | - |

## Command Mode

Router Configuration

Address Family Configuration

## Default

N/A

## Usage

Use this command to specify a prefix list for filtering BGP advertisements. Filtering by prefix list matches the prefixes of routes with those listed in the prefix list. If there is a match, the route is used. An empty prefix list permits all prefixes. If a given prefix does not match any entries of a prefix list, the route is denied access. When multiple entries of a prefix list match a prefix, the entry with the smallest sequence number is considered to be a real match.

The router begins the search at the top of the prefix list, with the sequence number 1. Once a match or deny occurs, the router does not need to go through the rest of the prefix list. For efficiency the most common matches or denies are listed at the top.

The neighbor distribute-list command is an alternative to the neighbor prefix-list command and only

one of them can be used for filtering to the same neighbor in any direction.

## Examples

```
Switch# configure terminal
Switch(config)# ip prefix-list list1 deny 30.0.0.0/24
Switch(config)# router bgp 12
Switch(config-router)# neighbor 10.10.10.10 prefix-list list1 in
```

## Related Commands

ip prefix-list

# 6.7.60 neighbor remote-as

## Command Purpose

Use this command to configure an internal or external BGP (iBGP or eBGP) TCP session with another router.

## Command Syntax

neighbor *NEIGHBORID* remote-as *ASNUM*

no neighbor *NEIGHBORID* remote-as *ASNUM*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (A.B.C.D\|TAG) | - |
| A.B.C.D | Specifies the address of the BGP neighbor in IPv4 format. | IPv4 Address in A.B.C.D format |
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |
| ASNUM | Neighbor's autonomous system number | 1-4294967295 |

## Command Mode

Router Configuration

## Default

N/A

## Usage

This command is used to configure iBGP and eBGP sessions with other neighbors. A peer-group support of this command is configured only after creating a specific peer-group.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 11
Switch(config-router)# neighbor 10.10.0.73 remote-as 345
```

## Related Commands

N/A

# 6.7.61 neighbor remove-private-AS

## Command Purpose

Use this command to remove the private Autonomous System (AS) number from outbound updates.

Use the no parameter with this command too revert to default.

## Command Syntax

neighbor *NEIGHBORID remove-private-AS*

no neighbor *NEIGHBORID remove-private-AS*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (A.B.C.D\|TAG) | - |
| A.B.C.D | Specifies the address of the BGP neighbor in IPv4 format. | IPv4 Address in A.B.C.D format |
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |

## Command Mode

Router Configuration

Address Family Configuration

## Default

Disabled

## Usage

The private AS numbers range from <64512-65535>. Private AS numbers are not advertised to the Internet. This command is used with external BGP peers only. The router removes the AS numbers only if the update includes private AS numbers. If the update includes both private and public AS numbers, the system treats it as an error.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 10
Switch(config-router)# neighbor 10.10.0.63 remove-private-AS
```

## Related Commands

N/A

# 6.7.62 neighbor route-reflector-client

## Command Purpose

Use this command to configure the router as a BGP route reflector and configure the specified neighbor as its client.

Use the no parameter with this command to indicate that the neighbor is not a client.

## Command Syntax

neighbor *NEIGHBORID* route-reflector-client

no neighbor *NEIGHBORID* route-reflector-client

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (A.B.C.D\|TAG) | - |
| A.B.C.D | Specifies the address of the BGP neighbor in IPv4 format. | IPv4 Address in A.B.C.D format |

| | | |
|---|---|---|
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |

## Command Mode

Router Configuration

Address Family Configuration

## Default

N/A

## Usage

Route reflectors are a solution for the explosion of iBGP peering within an autonomous system. By route reflection the number of iBGP peers within an AS is reduced. Use the neighbor route-reflector-client command to configure the local router as the route reflector and specify neighbors as its client.

An AS can have more than one route reflector. One route reflector treats the other route reflector as another iBGP speaker.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 10
Switch(config-router)# neighbor 10.10.0.72 route-reflector-client
```

## Related Commands

N/A

# 6.7.63 neighbor send-community

## Command Purpose

Use this command to specify that a community attribute should be sent to a BGP neighbor.

Use the no parameter with this command to remove the entry. Use the extended and no parameters to remove extended communities. Specifying no other parameter means standard communities only.

## Command Syntax

neighbor *NEIGHBORID* send-community ( both | extended | standard | )

no neighbor *NEIGHBORID* send-community ( both | extended | standard | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (A.B.C.D\|TAG) | - |
| A.B.C.D | Specifies the address of the BGP neighbor in IPv4 format. | IPv4 Address in A.B.C.D format |
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |
| both | Sends Standard and Extended Community attributes | - |
| extended | Sends Extended Community attributes | - |
| standard | Sends Standard Community attributes | - |

## Command Mode

Router Configuration

Address Family Configuration

## Default

None

## Usage

By default ,community attributes are not sent to a neighbor.To use this command to enable this command.Route-map can be based on neighbor address, peer group name or AS path information.

## Examples

```
Switch# configure terminal
Switch(config)# bgp config-type standard
Switch(config)# router bgp 10
Switch(config-router)# neighbor 10.10.0.72 send-community extended
```

## Related Commands

N/A

# 6.7.64 neighbor shutdown

## Command Purpose

Use this command to disable a neighbor.

Use the no parameter with this command to re-enable the neighbor.

## Command Syntax

neighbor *NEIGHBORID* shutdown

no neighbor *NEIGHBORID* shutdown

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (A.B.C.D\|TAG) | - |
| A.B.C.D | Specifies the address of the BGP neighbor in IPv4 format. | IPv4 Address in A.B.C.D format |

| | | |
|---|---|---|
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |

### Command Mode

Router Configuration

### Default

N/A

### Usage

This command shuts down any active session for the specified neighbor and clears all related routing data.

### Examples

```
Switch# configure terminal
Switch(config)# router bgp 10
Switch(config-router)# neighbor 10.10.0.72 shutdown
```

### Related Commands

N/A

## 6.7.65 neighbor soft-reconfiguration inbound

### Command Purpose

Use this command to configure to start storing updates.

Use the no parameter with this command to disable this function.

## Command Syntax

neighbor *NEIGHBORID* soft-reconfiguration inbound

no neighbor *NEIGHBORID* soft-reconfiguration inbound

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (A.B.C.D\|TAG) | - |
| A.B.C.D | Specifies the address of the BGP neighbor in IPv4 format. | IPv4 Address in A.B.C.D format |
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |

## Command Mode

Router Configuration

Address Family Configuration

## Default

N/A

## Usage

Use this command to store updates for inbound soft reconfiguration. Soft-reconfiguration may be used in lieu of BGP route refresh capability. Using this command enables local storage of all the received routes and their attributes. This requires additional memory. When a soft reset (inbound) is done on this neighbor, the locally stored routes are reprocessed according to the inbound policy. The BGP neighbor connection is not affected.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 12
Switch(config-router)# neighbor 10.10.10.10 soft-reconfiguration inbound
```

## Related Commands

N/A

# 6.7.66 neighbor strict-capability-match

## Command Purpose

Use this command to close the BGP connection if capability value does not completely match to remote peer.

Use the no parameter with this command to disable this function

## Command Syntax

neighbor *NEIGHBORID* strict-capability-match

no neighbor *NEIGHBORID* strict-capability-match

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (A.B.C.D\|TAG) | - |
| A.B.C.D | Specifies the address of the BGP neighbor in IPv4 format. | IPv4 Address in A.B.C.D format |
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |

## Command Mode

Router Configuration

## Default

N/A

## Usage

N/A

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 12
Switch(config-router)# neighbor 10.10.10.10 strict-capability-match
```

## Related Commands

N/A

# 6.7.67 neighbor timers

## Command Purpose

Use this command to set the timers for a specific BGP neighbor.

Use the no parameter with this command to clear the timers for a specific BGP neighbor

## Command Syntax

neighbor *NEIGHBORID* timers *KEEPALIVE HOLDTIME*

no neighbor *NEIGHBORID* timers

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (A.B.C.D\|TAG) | - |
| A.B.C.D | Specifies the address of the BGP neighbor in IPv4 format. | IPv4 Address in A.B.C.D format |

| | | |
|---|---|---|
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |
| KEEPALIVE | Frequency (in seconds) at which a router sends keepalive messages to its neighbor. The default is 60 seconds. | 1-65535 |
| HOLDTIME | Interval (in seconds) after which, on not receiving a keepalive message, the router declares a neighbor dead. The default is 180 seconds. | 3-65535 |

## Command Mode

Router Configuration

## Default

N/A

## Usage

Keepalive messages are sent by a router to inform another router that the BGP connection between the two is still active. The keepalive interval is the period of time between each keepalive message sent by the router. The holdtime interval is the time the router waits to receive a keepalive message and if it does not receive a message for this period it declares the neighbor dead.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 12
Switch(config-router)# neighbor 10.10.10.10 timers 60 120
```

## Related Commands

N/A

# 6.7.68 neighbor unsuppress-map

## Command Purpose

Use this command to selectively leak more-specific routes to a particular neighbor.

## Command Syntax

neighbor *NEIGHBORID* unsuppress-map *WORD*

no neighbor *NEIGHBORID* unsuppress-map *WORD*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (A.B.C.D\|TAG) | - |
| A.B.C.D | Specifies the address of the BGP neighbor in IPv4 format. | IPv4 Address in A.B.C.D format |
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |
| WORD | Name of route map | - |

## Command Mode

Router Configuration

Address Family Configuration

## Default

N/A

## Usage

When the aggregate-address command is used with the summary-only option, the more-specific routes of the aggregate are suppressed to all neighbors. Use the unsuppress-map command to selectively leak more-specific routes to a particular neighbor.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 10
Switch(config-router) neighbor 10.10.0.73 unsuppress-map mymap
Switch#configure terminal
Switch(config)#router bgp 10
Switch(config-router)address-family ipv4 unicast
Switch(config-router-af)neighbor 10.10.0.70 unsuppress-map mymap
```

## Related Commands

N/A

# 6.7.69 neighbor update-source

## Command Purpose

Use this command to allow internal BGP sessions to use any operational interface for TCP connections.

Use the no parameter with this command to restore the interface assignment to the closest interface.

## Command Syntax

neighbor *NEIGHBORID* update-source *IFNAME*

no neighbor *NEIGHBORID* update-source

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (A.B.C.D\|TAG) | - |
| A.B.C.D | Specifies the address of the BGP neighbor in IPv4 format. | IPv4 Address in A.B.C.D format |

| | | |
|---|---|---|
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |
| IFNAME | Specifies the loopback interface. | Support physical/aggregation/loopback/tunnel/vlan interfaces |

## Command Mode

Router Configuration

## Default

N/A

## Usage

Use this command in conjunction with any specified interface on the router. The loopback interface is the interface that is most commonly used with this command. The use of loopback interface eliminates a dependency and BGP does not have to rely on the availability of a particular interface for making TCP connections.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 10
Switch(config-router)# neighbor 10.10.0.72 update-source eth-0-1
```

## Related Commands

N/A

# 6.7.70 neighbor weight

## Command Purpose

Use this command to set default weights for routes from this neighbor.

Use the no parameter with this command to remove a weight assignment.

## Command Syntax

neighbor *NEIGHBORID* weight *WEIGHT*

no neighbor *NEIGHBORID* weight

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (A.B.C.D\|TAG) | - |
| A.B.C.D | Specifies the address of the BGP neighbor in IPv4 format. | IPv4 Address in A.B.C.D format |
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |
| WEIGHT | Specifies the weight this command assigns to the route. | 0-65535 |

## Command Mode

Router Configuration

## Default

N/A

## Usage

Use this command to specify a weight value to all routes learned from a neighbor. The route with the highest weight gets preference when there are other routes on the network.

Unlike the local-preference attribute, the weight attribute is relevant only to the local router.

The weights assigned using the set weight command overrides the weights assigned using this command.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 12
Switch(config-router)# neighbor 10.10.10.10 weight 60
```

## Related Commands

N/A

# 6.7.71 neighbor fall-over bfd

## Command Purpose

Use this command to establish BFD session on BGP neighbour.

Use the no parameter with this command to delete BFD session on BGP neighbour.

## Command Syntax

neighbor ( *A.B.C.D* | *X:X::X:X* | *WORD* ) fall-over bfd ( multihop | )

no neighbor ( *A.B.C.D* | *WORD* ) fall-over bfd ( multihop | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| A.B.C.D\|X:X::X:X\|WORD | Specifies the address of the BGP neighbor in IPv4 or IPv6 format or in peer group format. | IPv4/IPv6 Address in A.B.C.D /X:X::X:X format or in peer group format |
| multihop | establish multihop BFD session | - |

### Command Mode

Router Configuration

### Default

N/A

### Usage

Enabling bfd on bgp neighbor.

### Examples

```
Switch# configure terminal
Switch(config)# router bgp 12
Switch(config-router)# neighbor 10.10.10.10 fall-over bfd
```

### Related Commands

None

## 6.7.72 neighbor collide-established

### Command Purpose

Use this command to configure a BGP neighbor should be included into collision detection even its stats is established.

Use the no parameter with this command to disable this function.

### Command Syntax

neighbor *NEIGHBORID* collide-established

no neighbor *NEIGHBORID* collide-established

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (A.B.C.D\|TAG) | - |
| A.B.C.D | Specifies the address of the BGP neighbor in IPv4 format. | IPv4 Address in A.B.C.D format |

## Command Mode

Router Configuration

## Default

In the default case, if a neighbor's state is established, it will not be included into collision detection.

## Usage

When building connection with BGP neighbors, devices on both sides may start TCP connections in the sasme time. There will be two TCP connections in this case. To avoid reduncancy, collision detection is required to shutdown the connection on the side whose router-id or BGP identifier is smaller.

In the default case, when a BGP neighbor is already established, it will not be included into collision detection, which may causes redundant connections. Therefore, this command should be used to include established neighbors into collision detection.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 100
Switch(config-router)# neighbor 10.1.1.2 collide-establishe
```

## Related Commands

N/A

# 6.7.73 neighbor disallow-infinite-holdtime

## Command Purpose

Use this command to prohibit BGP neighbor to use infinite holdtime in OPEN message.

Use the no parameter with this command to allow BGP neighbor to use infinite holdtime.

## Command Syntax

neighbor *NEIGHBORID* disallow-infinite-holdtime

no neighbor *NEIGHBORID* disallow-infinite-holdtime

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (A.B.C.D\|TAG) | - |
| A.B.C.D | Specifies the address of the BGP neighbor in IPv4 format. | IPv4 Address in A.B.C.D format |

## Command Mode

Router Configuration

## Default

In the default case, if a neighbor's state is established, it will not be included into collision detection.

## Usage

After building connection with BGP neighbors, devices need to send keepalive message to keep the connetion. The interval of sending keepalive message is the holdtime. When a neighbor negotiated the holdtime to be 0(infinite), the two neighbors on both sides will not need keepalive messages anymore.

Use this command to prohibit the neighbor to neigotiate the holdtime to infinite.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 100
Switch(config-router)# neighbor 10.1.1.2 disallow-infinite-holdtime
```

## Related Commands

N/A

# 6.7.74 neighbor dont-capability-negotiate

## Command Purpose

Use this command to prohibit BGP neighbor to attach capability segement in OPEN message.

Use the no parameter with this command to allow BGP neighbor to attach capability segement.

## Command Syntax

neighbor *NEIGHBORID* dont-capability-negotiate

no neighbor *NEIGHBORID* dont-capability-negotiate

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (A.B.C.D\|TAG) | - |
| A.B.C.D | Specifies the address of the BGP neighbor in IPv4 format. | IPv4 Address in A.B.C.D format |

## Command Mode

Router Configuration

## Default

In the default case, it is allowed for a BGP neighbor to attach the capability segment in OPEN messages.

## Usage

In the BGP open messages, neighbors can negotiate capabilities through the capability segment in open messages.

When the switch received an open message containing capability segment after enabled this function, it will send a notification message and shutdown the connetion with the neighbor.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 100
Switch(config-router)# neighbor 10.1.1.2 dont-capability-negotiate
```

## Related Commands

N/A

# 6.7.75 neighbor enforce-multihop

## Command Purpose

Use this command to allow EBGP neighbor to build connection through multihop routes.

Use the no parameter with this command to prohibit EBGP neighbor to build connection through multihop routes, which means EBGP neighbor must be directly connected.

## Command Syntax

neighbor *NEIGHBORID* enforce-multihop

no neighbor *NEIGHBORID* enforce-multihop

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (A.B.C.D\|TAG) | - |
| A.B.C.D | Specifies the address of the BGP neighbor in IPv4 format. | IPv4 Address in A.B.C.D format |

## Command Mode

Router Configuration

## Default

In the default case, it is only allowed to build connection with directly connected EBGP neighbor.

## Usage

Usually EBGP neighbor connection is built through direct connection. And the TTL of its TCP packets is 1. When build neighbor through non-direct connection like loopback interface, due to the limitation of TTL, the connection will fail. Then this command will be used to allow connection with EBGP neighbor through multihop routes.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 100
Switch(config-router)# neighbor 10.1.1.2 enforce-multihop
```

## Related Commands

N/A

# 6.7.76 neighbor interface

## Command Purpose

Use this command to specify the interface for building connection with BGP neighbor.

Use the no parameter with this command to recover the default configuration.

## Command Syntax

neighbor *NEIGHBORID* interface *IFNAME*

no neighbor *NEIGHBORID* interface

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (A.B.C.D\|TAG) | - |
| A.B.C.D | Specifies the address of the BGP neighbor in IPv4 format. | IPv4 Address in A.B.C.D format |
| IFNAME | Specifies the name of interface. | - |

## Command Mode

Router Configuration

## Default

In the default case, use the interface that has corresponding IP subnet with the IP address of the neighbor to build BGP connection.

## Usage

N/A

## Examples

```
Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# router bgp 100
Switch(config-router)# neighbor 10.1.1.2 interface eth-0-1

Switch# configure terminal
Switch(config)# router bgp 100
Switch(config-router)# neighbor 10.1.1.2 interface eth-0-1
```

## Related Commands

N/A

N/A

# 6.7.77 neihgbor route-map

## Command Purpose

Use this command to apply route-map on BGP neighbor.

Use the no parameter with this command to cancel the route-map applied on neighbor.

## Command Syntax

neighbor *NEIGHBORID* route-map *RMAP* ( in | out )

no neighbor *NEIGHBORID* route-map *RMAP* ( in | out )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (A.B.C.D\|TAG) | - |
| A.B.C.D | Specifies the address of the BGP neighbor in IPv4 format. | IPv4 Address in A.B.C.D format |
| RMAP | Specifies the name of route-map to be applied. | - |

## Command Mode

Router Configuration

## Default

In the default case, no route-map is applied on incoming and outcoming routes of neighbors.

## Usage

Use this command to edit incoming or outcoming routes of neighbors through route-map.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 100
Switch(config-router)# neighbor 10.1.1.2 route-map rmap1 in
```

## Related Commands

N/A

# 6.7.78 neighbor route-server-client

## Command Purpose

Use this command to set neighbor as route-server-client.

Use the no parameter with this command to unset neighbor as route-server-client.

## Command Syntax

neighbor *NEIGHBORID* route-server-client

no neighbor *NEIGHBORID* route-server-client

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (A.B.C.D\|TAG) | - |
| A.B.C.D | Specifies the address of the BGP neighbor in IPv4 format. | IPv4 Address in A.B.C.D format |

## Command Mode

Router Configuration

## Default

N/A

## Usage

N/A

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 100
Switch(config-router)# neighbor 10.1.1.2 route-server-client
```

## Related Commands

N/A

# 6.7.79 network

## Command Purpose

Use this command to specify the networks to be advertised by the BGP routing process. A unicast network address without a mask is accepted if it falls into the natural boundary of its class. A class-boundary mask is derived if the address matches its natural class-boundary.

Use the no form of this command to remove a network route entry.

## Command Syntax

network *A.B.C.D*

network *A.B.C.D* route-map *WORD*

no network *A.B.C.D*

no network *A.B.C.D* route-map *WORD*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| A.B.C.D | IP prefix <network>, e.g., 35.0.0.0 | IPv4 Address in A.B.C.D format |
| WORD | Name of the route map | Up to 20 characters |

## Command Mode

Router Configuration

Address Family Configuration

## Default

N/A

## Usage

N/A

## Examples

The following example illustrates a Class-A address configured as a network route. The natural Class-A network prefix mask length of 8 will be internally derived, that is, 2.0.0.0/8:

```
Switch# configure terminal
Switch(config)#router bgp 1
Switch(config-router)#network 2.0.0.0

!
router bgp 1
no synchronization
```

```
network 2.0.0.0
!
```

### Related Commands

N/A

## 6.7.80 network synchronization

### Command Purpose

Use this command to ensure the exact same static network prefix, specified through any of the network commands, is local or has IGP reachability (in the NSM RIB) before being introduced into the BGP RIB.

Use the no parameter with this command to disable this function.

### Command Syntax

network synchronization

no network synchronization

### Command Mode

Router Configuration

Address Family Configuration

### Default

Network synchronization is disabled by default.

### Usage

N/A

### Examples

The following example enables IGP synchronization of BGP static network routes in the router configuration mode:

```
Switch# configure terminal
Switch(config)# router bgp 11
Switch(config-router)# network synchronization
```

### Related Commands

N/A

## 6.7.81 synchronization

### Command Purpose

Use this command to enable IGP synchronization of Internal BGP (iBGP) learned routes with the Internal Gateway Protocol (IGP) system in the router configuration mode or in the address-family configuration mode.

Use the no parameter with this command to disable this function.

### Command Syntax

synchronization

no synchronization

### Command Mode

Router Configuration

Address Family Configuration

### Default

IGP synchronization is disabled.

### Usage

Synchronization is used when a BGP router should not advertise routes learned from iBGP neighbors, unless those routes are also present in an IGP (for example, OSPF). Synchronization may be enabled when all the routers in an autonomous system do not speak BGP, and the autonomous system is a transit for other autonomous systems. The no synchronization command is used when BGP router can advertise

routes learned from its iBGP neighbors without waiting for the IGP reachability to be present.

## Examples

The following example enables IGP synchronization of BGP static network routes in the IPv4-Unicast address family:

```
Switch# configure terminal
Switch(config)# router bgp 11
Switch(config)# address-family ipv4 unicast
Switch(config-af)# network synchronization
```

## Related Commands

N/A

# 6.7.82 router bgp

## Command Purpose

Use this command to configure a BGP routing process.

Use the no parameter with this command to disable a routing process.

## Command Syntax

router bgp *ASN*

no router bgp *ASN*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ASN | Specifies the Autonomous System (AS) number | 1-4294967295 |

## Command Mode

Global Configuration

## Default

N/A

## Usage

The router bgp command enables a BGP routing process.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 12
Switch(config-router)#
```

## Related Commands

N/A

# 6.7.83 redistribute

## Command Purpose

Use this command to redistribute routes from other sources to BGP routing-table.

Use the no parameter with this command to cancel the redistributing.

## Command Syntax

redistribute ( connected | isis | ospf | rip | static ) ( route-map *RMAP* | )

no redistribute ( connected | isis | ospf | rip | static ) ( route-map *RMAP* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| RMAP | Specifies the name of route-map to be applied. | - |

## Command Mode

Global Configuration

Address Family Configuration

## Default

In the default case, no route is redistributed to BGP routing-table.

### Usage

N/A

### Examples

```
Switch# configure terminal
Switch(config)# router bgp 100
Switch(config-router)# redistribute connected
```

### Related Commands

N/A

## 6.7.84 show debugging bgp

### Command Purpose

Use this command to display the BGP debugging option set.

### Command Syntax

show debugging bgp

### Command Mode

Privileged EXEC

### Default

N/A

### Usage

None

### Examples

```
Switch# show debugging bgp
```

## Related Commands

N/A

# 6.7.85 show ip bgp

## Command Purpose

Use this command to display BGP network information.

## Command Syntax

show ip bgp ( *IPADDRESS* | )

show ip bgp ipv4 *PREFIX* ( *IPADDRESS* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IPADDRESS | A.B.C.D\|A.B.C.D/M Specifies the address and length. | IPv4 Address in A.B.C.D format or IPv4 Address and mask length in A.B.C.D/M format |
| ipv4 | Specifies the address family. The type of address family determines the routing table that is Specifies the address family. The type of address family determines the routing table that is displayed. | - |
| PREFIX | (multicast\|unicast) | - |
| unicast | Specifies a IPv4 unicast address family. This is the default option. | - |
| multicast | Specifies a IPv4 multicast address family. | - |

## Command Mode

Privileged EXEC

## Default

N/A

### Usage

N/A

### Examples

```
Switch# show ip bgp 10.10.1.34/24
```

### Related Commands

N/A

## 6.7.86 show ip bgp attribute-info

### Command Purpose

Use this command to show bgp attribute information.

### Command Syntax

show ip bgp attribute-info

### Command Mode

Privileged EXEC

### Default

N/A

### Usage

N/A

### Examples

This is a sample output from the show ip bgp attribute-info command displaying internal attribute information:

```
Switch# show ip bgp attribute-info
```

## Related Commands

N/A

# 6.7.87 show ip bgp cidr-only

## Command Purpose

Use this command to display routes with non-natural network masks.

## Command Syntax

show ip bgp cidr-only

show ip bgp ipv4 *PREFIX* cidr-only

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ipv4 | Specifies the address family. The type of address family determines the routing table that is displayed. | - |
| PREFIX | (multicast\|unicast) | - |
| unicast | Specifies a IPv4 unicast address family. This is the default option. | - |
| multicast | Specifies a IPv4 multicast address family. | - |

## Command Mode

Privileged EXEC

## Default

N/A

## Usage

N/A

### Examples

This is a sample output from the show ip bgp cidr-only command:

```
Switch# show ip bgp cidr-only
```

### Related Commands

N/A

## 6.7.88 show ip bgp community

### Command Purpose

Use this command to display routes matching the communities.

### Command Syntax

show ip bgp community *TYPE* ( exact-match | )

show ip bgp ipv4 *PREFIX* community *TYPE* ( exact-match | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| TYPE | AA:NN\|local-AS\|no-advertise\|no-export | - |
| AA:NN | Specifies the valid value for the community number. This format represents the 32 bit communities value, where AS is the high order 16 bits and VAL is the low order 16 bits in digit format. | AA is in the range 1-65535 NN is in the range of 1-65535 |
| local-AS | Do not send outside local AS (well-known community). | - |
| no-advertise | Do not advertise to any peer (well-known community). | - |
| no-export | Do not export to next AS (well-known community). | - |
| exact-match | Specifies that display the exact match of the communities. | - |
| PREFIX | (multicast\|unicast) | - |

| | | |
|---|---|---|
| multicast | Specifies a IPv4 multicast address family. | - |
| unicast | Specifies a IPv4 unicast address family. This is the default option. | - |

### Command Mode

Privileged EXEC

### Default

N/A

### Usage

N/A

### Examples

```
Switch# show ip bgp community 10:23 exact-match
Switch# show ip bgp ipv4 multicast community 10:23 exact-match
```

### Related Commands

N/A

## 6.7.89 show ip bgp community-info

### Command Purpose

Use this command to list all BGP community information.

### Command Syntax

show ip bgp community-info

### Command Mode

Privileged EXEC

### Default

N/A

### Usage

N/A

### Examples

```
Switch# show ip bgp community-info
```

### Related Commands

N/A

## 6.7.90 show ip bgp community-list

### Command Purpose

Use this command to display routes that match the community-list.

### Command Syntax

show ip bgp community-list *LISTNAME* ( exact-match | )

show ip bgp ipv4 *PREFIX* community-list *LISTNAME* ( exact-match | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LISTNAME | Specifies the community list name. | Up to 20 characters |
| exact-match | Displays only routes that have exactly the same specified communities. | - |
| ipv4 | Specifies the address family. The type of address family determines the routing table that is Specifies the address family. The type of address family determines the routing table that is displayed. | - |
| PREFIX | (multicast\|unicast) | - |

| | | |
|---|---|---|
| unicast | Specifies a IPv4 unicast address family. This is the default option. | - |
| multicast | Specifies a IPv4 multicast address family. | - |

## Command Mode

Privileged EXEC

## Default

N/A

## Usage

N/A

## Examples

```
Switch# show ip bgp community-list mylist exact-match
Switch# show ip bgp ipv4 unicast community-list mylist
```

## Related Commands

N/A

# 6.7.91 show ip bgp dampening

## Command Purpose

Use this command to display detailed information about dampening.

## Command Syntax

show ip bgp dampening ( dampened-paths | flap-statistics | parameters )

show ip bgp ipv4 *PREFIX* dampening ( dampened-paths | flap-statistics | parameters )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| dampened-paths | Display paths suppressed due to dampening. | - |
| flap-statistics | Display flap statistics of routes. | - |
| parameters | Display details of configured dampening parameters. | - |
| ipv4 | Specifies the address family. The type of address family determines the routing table that is displayed. | - |
| PREFIX | (multicast\|unicast) | - |
| unicast | Specifies a IPv4 unicast address family. This is the default option. | - |
| multicast | Specifies a IPv4 multicast address family. | - |

## Command Mode

Privileged EXEC

## Default

N/A

## Usage

N/A

## Examples

Enable bgp dampening to maintain dampened-path information in memory. The following is a sample output displaying all the dampening parameters:

```
Switch# show ip bgp dampening parameters
```

## Related Commands

N/A

# 6.7.92 show ip bgp filter-list

## Command Purpose

Use this command to display routes conforming to the filter-list.

## Command Syntax

show ip bgp filter-list *LISTNAME*

show ip bgp ipv4 *PREFIX* filter-list *LISTNAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LISTNAME | Specifies the regular-expression access list name. | Up to 20 characters |
| ipv4 | Specifies the address family. The type of address family determines the routing table that is Specifies the address family. The type of address family determines the routing table that is displayed. | - |
| PREFIX | (multicast\|unicast) | - |
| unicast | Specifies a IPv4 unicast address family. This is the default option. | - |
| multicast | Specifies a IPv4 multicast address family. | - |

## Command Mode

Privileged EXEC

## Default

N/A

## Usage

N/A

## Examples

```
Switch# show ip bgp filter-list mylist
Switch# show ip bgp ipv4 unicast filter-list Switch
```

## Related Commands

N/A

# 6.7.93 show ip bgp inconsistent-as

## Command Purpose

Use this command to display routes with inconsistent AS Paths.

## Command Syntax

show ip bgp inconsistent-as

show ip bgp ipv4 *PREFIX* inconsistent-as

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ipv4 | Specifies the address family. The type of address family determines the routing table that is displayed. | - |
| PREFIX | (multicast\|unicast) | - |
| unicast | Specifies a IPv4 unicast address family. This is the default option. | - |
| multicast | Specifies a IPv4 multicast address family. | - |

## Command Mode

Privileged EXEC

## Default

N/A

## Usage

N/A

## Examples

```
Switch# show ip bgp inconsistent-as
Switch# show ip bgp ipv4 unicast inconsistent-as
```

## Related Commands

N/A

# 6.7.94 show ip bgp neighbors

## Command Purpose

Use this command to display detailed information on TCP and BGP neighbor connections.

## Command Syntax

show ip bgp neighbors ( *IPADDRESS* ( advertised-routes | *RECEIVED* | received-routes | routes ) | )

show ip bgp ipv4 *PREFIX* neighbors ( *IPADDRESS* ( advertised-routes | received | received-routes | routes ) | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IPADDRESS | Specifies an IPv4 address. | IPv4 Address in A.B.C.D format |
| advertised-routes | Displays the routes advertised to a BGP neighbor. | - |
| received | received prefix-filter Displays all received routes, both accepted and rejected. | - |
| prefix-filter | Displays the prefix-list filter. | - |

| | | |
|---|---|---|
| received-routes | Displays the received routes from neighbor. To display all the received routes from the neighbor, configure the BGP soft reconfigure first. routes Displays all accepted routes learned from neighbors. | - |
| routes | Display routes learned from neighbor | - |
| PREFIX | (multicast\|unicast) | - |
| unicast | Specifies a IPv4 unicast address family. This is the default option. | - |
| multicast | Specifies a IPv4 multicast address family. | - |
| ipv4 | Specifies the address family. The type of address family determines the routing table that is displayed. | - |

## Command Mode

Privileged EXEC

## Default

N/A

## Usage

N/A

## Examples

This is a sample output from the show ip bgp neighbors command displaying information about the specified neighbor:

```
Switch# show ip bgp neighbors
```

## Related Commands

N/A

# 6.7.95 show ip bgp paths

## Command Purpose

Use this command to display BGP path information.

## Command Syntax

show ip bgp paths

show ip bgp ipv4 *PREFIX* paths

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ipv4 | Specifies the address family. The type of address family determines the routing table that is displayed. | - |
| PREFIX | (multicast\|unicast) | - |
| unicast | Specifies a IPv4 unicast address family. This is the default option. | - |
| multicast | Specifies a IPv4 multicast address family. | - |

## Command Mode

Privileged EXEC

## Default

N/A

## Usage

N/A

## Examples

```
Switch# show ip bgp paths
```

## Related Commands

N/A

# 6.7.96 show ip bgp prefix-list

## Command Purpose

Use this command to display routes matching the prefix-list.

## Command Syntax

show ip bgp prefix-list *LIST*

show ip bgp ipv4 *PREFIX* prefix-list *LIST*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LIST | Specifies the name of the IP prefix list. | Up to 40 characters |
| ipv4 | Specifies the address family. The type of address family determines the routing table that is displayed. | - |
| PREFIX | (multicast\|unicast) | - |
| unicast | Specifies a IPv4 unicast address family. This is the default option. | - |
| multicast | Specifies a IPv4 multicast address family. | - |

## Command Mode

Privileged EXEC

## Default

N/A

## Usage

N/A

## Examples

```
Switch# show ip bgp prefix-list mylist
```

## Related Commands

N/A

# 6.7.97 show ip bgp quote-regexp

## Command Purpose

Use this command to display routes matching the AS path regular expression in quotes.

## Command Syntax

show ip bgp quote-regexp *LINE*

show ip bgp ipv4 *PREFIX* quote-regexp *LINE*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LINE | Specifies a regular-expression to match the BGP AS paths | A regular-expression in quote |
| ipv4 | Specifies the address family. The type of address family determines the routing table that is displayed. | - |
| PREFIX | (multicast\|unicast) | - |
| unicast | Specifies a IPv4 unicast address family. This is the default option. | - |
| multicast | Specifies a IPv4 multicast address family. | - |

## Command Mode

Privileged EXEC

## Default

N/A

## Usage

N/A

## Examples

```
Switch# show ip bgp quote-regexp "Switch"
```

## Related Commands

N/A

# 6.7.98 show ip bgp regexp

## Command Purpose

Use this command to display routes matching the AS path regular expression.

## Command Syntax

show ip bgp regexp *LINE*

show ip bgp ipv4 *PREFIX* regexp *LINE*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| regexp | Displays routes matching the AS path regular expression. | - |
| LINE | Specifies a regular expression to match the BGP AS paths. | A regular-expression |
| ipv4 | Specifies the address family. The type of address family determines the routing table that is displayed. | - |
| PREFIX | (multicast\|unicast) | - |
| unicast | Specifies a IPv4 unicast address family. This is the default option. | - |
| multicast | Specifies a IPv4 multicast address family. | - |

### Command Mode

Privileged EXEC

### Default

N/A

### Usage

N/A

### Examples

```
Switch# show ip bgp regexp myexpression
```

### Related Commands

N/A

## 6.7.99 show ip bgp scan

### Command Purpose

Use this command to display BGP scan status.

### Command Syntax

show ip bgp scan

### Command Mode

Privileged EXEC

### Default

N/A

## Usage

N/A

## Examples

```
Switch# show ip bgp scan
```

## Related Commands

N/A

# 6.7.100 show ip bgp summary

## Command Purpose

Use this command to display a summary of BGP neighbor status.

## Command Syntax

show ip bgp summary

show ip bgp ipv4 *PREFIX* summary

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ipv4 | Specifies the address family. The type of address family determines the routing table that is displayed. | - |
| PREFIX | (multicast\|unicast) | - |
| unicast | Specifies a IPv4 unicast address family. This is the default option. | - |
| multicast | Specifies a IPv4 multicast address family. | - |

## Command Mode

Privileged EXEC

## Default

N/A

## Usage

N/A

## Examples

This is a sample output from the show ip bgp summary command displaying a summary of BGP neighbor status:

```
Switch# show ip bgp summary
```

## Related Commands

N/A

# 6.7.101 show ip bgp vpnv4 all

## Command Purpose

Use this command to display VPNv4 NLRI specific information.

## Command Syntax

show ip bgp vpnv4 all *TYPE*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| all | Displays information about all VPNv4 NLRIs | - |
| TYPE | (A.B.C.D\|neighbors\|summary\|) | - |
| neighbors | Displays information about BGP neighbors. | - |
| summary | Displays summary of the BGP neighbor status. | - |
| A.B.C.D | Network for which information will be displayed in the BGP routing table. | IPv4 Address in A.B.C.D format |

## Command Mode

Privileged EXEC

## Default

N/A

## Usage

N/A

## Examples

This is a sample output from the show ip bgp vpnv4 all command displaying VPNv4 specific information:

```
Switch# show ip bgp vpnv4 all
```

## Related Commands

N/A

# 6.7.102 show ip bgp vpnv4 rd

## Command Purpose

Use this command to display VPNv4 NLRI specific information.

## Command Syntax

show ip bgp vpnv4 rd *WORD TYPE*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| rd | Display information for a route distinguisher | - |
| WORD | VPN Route Distinguisher | Up to 15 characters |
| TYPE | (A.B.C.D\|neighbors\|summary\|) | - |
| neighbors | Displays information about BGP neighbors. | - |

| | | |
|---|---|---|
| summary | Displays summary of the BGP neighbor status. | - |
| A.B.C.D | Network for which information will be displayed in the BGP routing table. | IPv4 Address in A.B.C.D format |

## Command Mode

Privileged EXEC

## Default

N/A

## Usage

N/A

## Examples

This is a sample output from the show ip bgp vpnv4 rd command displaying VPNv4 specific information:

```
Switch# show ip bgp vpnv4 rd 123
```

## Related Commands

N/A

# 6.7.103 show ip bgp vpnv4 vrf

## Command Purpose

Use this command to display VPNv4 NLRI specific information.

## Command Syntax

show ip bgp vpnv4 vrf *WORD TYPE*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| vrf | VPN Routing/Forwarding instance | - |
| WORD | VPN Routing/Forwarding instance name | Up to 31 characters |
| TYPE | (A.B.C.D\|neighbors\|summary\|) | - |
| neighbors | Displays information about BGP neighbors. | - |
| summary | Displays summary of the BGP neighbor status. | - |
| A.B.C.D | Network for which information will be displayed in the BGP routing table. | IPv4 Address in A.B.C.D format |

## Command Mode

Privileged EXEC

## Default

N/A

## Usage

N/A

## Examples

This is a sample output from the show ip bgp vpnv4 rd command displaying VPNv4 specific information:

```
Switch# show ip bgp vpnv4 vrf 123
```

## Related Commands

N/A

# 6.7.104 timers

## Command Purpose

Use this command sets the BGP keepalive timer and holdtime timer values.

Use the no parameter with this command to reset timers to default value.

## Command Syntax

timers bgp *KEEPALIVE HOLDTIME*

no timers bgp

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| KEEPALIVE | <0-65535> The frequency with which the keepalive messages are sent to the neighbors.<br>The default value is 60 seconds. | 0-65535 |
| HOLDTIME | The interval after which the neighbor is considered dead if keepalive messages<br>are not received. The default holdtime value is 180 seconds. | 3-65535 |

## Command Mode

Router Configuration

## Default

N/A

## Usage

This command is used globally to set or unset the keepalive and holdtime values for all the neighbors.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 10
Switch(config-router)# timers bgp 40 120
```

## Related Commands

N/A

# 6.7.105 max-paths

## Command Purpose

Use this command to change the maximum ecmp.

Use the no parameter with this command to revert to the default setting.

## Command Syntax

max-paths ( ebgp | ibgp ) *PATHS*

no max-paths ( ebgp | ibgp ) ( *PATHS* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ebgp | Session EBGP ECMP | - |
| ibgp | Session IBGP ECMP | - |
| PATHS | Set multipath ECMP numbers for BGP | 2-64 |

## Command Mode

Router Configuration

## Default

The default local preference value is 1.

## Usage

None

## Examples

The following example shows how to configure max-paths:

```
Switch# configure terminal
Switch(config)# router bgp 100
Switch(config-router)# max-paths ebgp 2
```

## Related Commands

N/A

# 6.7.106 show ip community-list

## Command Purpose

Use this command to display ip community-list information.

## Command Syntax

show ip community-list ( *LISTNUM* | *WORD* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LISTNUM | ID for ip community-list | 1-199 |
| WORD | Specified ip community-list name | Up to 20 characters |

## Command Mode

Privileged EXEC

## Default

None

## Usage

If there are no parameters, display information for all ip community lists.

### Examples

This is a sample output from the show ip community-list command displaying ip community-list information

```
Switch# show ip community-list 1
Community standard list 1
    permit 1:1
```

### Related Commands

ip community-list

## 6.8 ISIS Commands

### 6.8.1 accept-lifetime

### Command Purpose

Use this command to specify the time period during which the authentication on a key chain is received as valid.

Use the no parameter with this command to negate this command.

### Command Syntax

accept-lifetime *HH:MM:SS DAY MONTH YEAR HH1:MM1:SS1 DAY1 MONTH1 YEAR1*

accept-lifetime *HH:MM:SS MONTH DAY YEAR* infinite

accept-lifetime *HH:MM:SS MONTH DAY YEAR* duration <1-2147483646>

no accept-lifetime

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| HH:MM:SS | Specify the end time of accept-lifetime in hours, minutes and seconds. | 0-23:0-59:0-59 |
| DAY | Specify the day of the month to end. | 1-31 |

| | | |
|---|---|---|
| MONTH | Specify the month of the year to end as the first three letters of the month, for example, december. | january, february, march, april, may, june, july, august, september, october, november, december |
| YEAR | Specify the year to end. | 1993-2035 |
| HH1:MM1:SS1 | | 0-23:0-59:0-59 |
| DAY1 | | 1-31 |
| MONTH1 | | january, february, march, april, may, june, july, august, september, october, november, december |
| YEAR1 | | 1993-2035 |
| <1-2147483646> | Specify the actual end time duration of a key in seconds. | 1-2147483646 |

## Command Mode

Key Chain Configuration

## Default

None

## Usage

None

## Examples

The follow example shows how to specify the time period during which the authentication on a key chain is received as valid.:

```
Switch# configure terminal
Switch(config)# key chain mychain
Switch(config-keychain)# key 1
Switch(config-keychain-key)# accept-lifetime 03:03:01 Dec 3 2004 04:04:02 Oct 6
2006
```

## Related Commands

None

## 6.8.2 address-family ipv6

### Command Purpose

Use this command to enter 'address-family ipv6' mode, where users can configure IPv6 routing specific configuration.

Use the no parameter with this command to remove all configuration under 'address-family ipv6'.

### Command Syntax

address-family ipv6 ( unicast | )

no address-family ipv6 ( unicast | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| unicast | Specify unicast routing for IPv6. | - |

### Command Mode

Router Configuration

### Default

None

### Usage

None

### Examples

The following example shows how to to enter 'address-family ipv6' mode:

```
Switch# configure terminal
Switch(config)# router isis bb
Switch(config-router)# address-family ipv6 unicast
Switch(config-router-af)#
```

### Related Commands

None

## 6.8.3 adjacency-check

### Command Purpose

Use this command to configure the policy of adjacency based on the protocol related TLVs in the Hello packet. Check adjacency with protocol related TLVs including Protocols Supported TLV or IP Interface Address TLV by default. The command with no parameter disables this check.

Use the no parameter with this command to disable the adjacency check.

### Command Syntax

adjacency-check

no adjacency-check

### Command Mode

Router Configuration

Address Family Configuration

### Default

Enabled

### Usage

None

### Examples

The following example shows how to to enable adjacency check:

```
Switch# configure terminal
Switch(config)# router isis bb
Switch(config-router-af)# adjacency-check
```

## Related Commands

None

# 6.8.4 area-password

## Command Purpose

Use this command to set the authentication password for the Level-1 area and to set authentication on Level-1 SNP PDUs. This command enables authentication when receiving and sending LSP and SNP PDU in Level-1 areas. Area password must be the same for all the routers in the same area.

Use the no parameter with this command to clear the area password.

## Command Syntax

area-password *PASSWORD*

area-password *WORD* authenticate snp ( send-only | validate )

no area-password

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PASSWORD | Specify the password string. | Up to 254 characters |
| authenticate | Specify to insert the password into Level-1 SNP PDUs. | - |
| snp | Specify the sequence number PDU (SNP). | - |
| send-only | Specify to only insert the password into the Level-1 SNP PDUs, but not check the password in SNP PDUs that it receives. Use this keysword during a software upgrade to ease the transition. | - |
| validate | Specify to insert the password into the Level-1 SNP PDUs and check the password in SNPs that it receives. | - |

## Command Mode

Router Configuration

## Default

Not configured

## Usage

None

## Examples

The following example shows how to set the authentication password for the Level-1 area:

```
Switch# configure terminal
Switch(config)# router isis bb
Switch(config-router)# area-password code1234

Switch(config-router)# no area-password
```

## Related Commands

None

# 6.8.5 authentication key-chain

## Command Purpose

Use this command to set the key chain to be used for authentication at the instance level. Authentication mode must be set to md5 to configure the key chain. If no key chain is configured with the key-chain command, no key-chain authentication is performed.

Only one authentication key-chain is applied to an interface at a time. That is, issuing a second isis authentication key-chain command overrides the first isis authentication key-chain command. Authentication can be specified for an individual interface using the isis authentication key-chain command.

Use the no parameter with this command to unset the key chain used for authentication.

## Command Syntax

authentication key-chain *WORD* ( level-1 | level-2 | )

no authentication key-chain *PASSWORD* ( level-1 | level-2 | )

no authentication key-chain ( level-1 | level-2 | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| WORD | Specify the chain name (valid authentication keys). | A String of key chain name |
| level-1 | Specify an authentication key-chain for level-1 PDUs. | - |
| level-2 | Specify an authentication key-chain for level-2 PDUs. | - |

## Command Mode

Router Configuration

## Default

Disabled

## Usage

If neither the level-1 nor the level-2 keysword is configured, it applies to both levels.

## Examples

The following example shows how to set the key chain to be used for authentication at the level-1:

```
Switch# configure terminal
Switch(config)# router isis 1
Switch(config-router)# authentication key-chain code1234 level-1
```

## Related Commands

None

# 6.8.6 authentication mode md5

## Command Purpose

Use this command to set the MD5 authentication mode at the instance level.

If clear-text authentication was configured using the area-password or domain-password commands, the authentication mode command overrides both of those commands (based on the level at which MD5 is configured). If the authentication mode command was used first, and subsequently an attempt is made to use the area-password or domain-password commands, the attempt fails. To configure clear-text authentication using the area-password or domain-password commands, first use the no authentication mode command.

The type of authentication and the level to which it applies can be specified for a single interface, rather than per instance, using the isis authentication mode command.

Use the no parameter with this command to unset the MD5 authentication mode.

## Command Syntax

authentication mode ( md5 | text ) ( level-1 | level-2 | )

no authentication mode ( md5 | text ) ( level-1 | level-2 | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| md5 | Keyed message digest | - |
| text | Text mode | - |
| level-1 | Specify an authentication key-chain for level-1 PDUs. | - |
| level-2 | Specify an authentication key-chain for level-2 PDUs. | - |

## Command Mode

Router Configuration

## Default

Disabled

## Usage

If neither the level-1 nor the level-2 keysword is configured, it applies to both levels.

## Examples

The following example shows how to set the MD5 authentication mode at the level-1:

```
Switch# configure terminal
Switch(config)# router isis 1
Switch(config-router)# authentication mode md5 level-1
Switch(config-router)# no authentication mode md5 level-1
```

## Related Commands

None

# 6.8.7 authentication send-only

## Command Purpose

Use this command to set the send-only option at the instance level.

Use this command before configuring the authentication mode and authentication key-chain, so that the implementation of authentication goes smoothly.

After all routers that must communicate are configured with this command, enable the authentication mode and key chain on each router. Then, specify the no authentication send-only command to disable the send-only feature.

If neither the level-1 nor level-2 keysword is configured, the send-only feature applies to both levels.The send-only option applies to both levels if no level is specified.

Use the no parameter with this command to unset the send-only option.

## Command Syntax

authentication send-only ( level-1 | level-2 | )

no authentication send-only ( level-1 | level-2 | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| level-1 | Specify an authentication key-chain for level-1 PDUs. | - |
| level-2 | Specify an authentication key-chain for level-2 PDUs. | - |

## Command Mode

Router Configuration

## Default

Disabled

## Usage

If neither the level-1 nor the level-2 keysword is configured, it applies to both levels.

## Examples

The following example shows how to set the send-only option at the level-1.:

```
Switch# configure terminal
Switch(config)# router isis 1
Switch(config-router)# authentication send-only level-1
Switch(config-router)# no authentication send-only level-1
```

### Related Commands

None

## 6.8.8 bfd all-interfaces

### Command Purpose

Use this command to enable the Bidirectional Forwarding Detection (BFD) feature on the interfaces enabled with this ISIS instance.

This command sets BFD fall-over check for all the neighbors under specified process. To disable BFD checking on particular interface use isis bfd disable command at interface mode.

Use the no parameter with this command to disable BFD functionality for an instance.

### Command Syntax

bfd all-interfaces

no bfd all-interfaces

### Command Mode

Router Configuration

### Default

Disabled

### Usage

None

### Examples

The following example shows how to enable the BFD feature on the interfaces enabled with this ISIS instance.:

```
Switch# configure terminal
Switch(config)# router isis
Switch(config-router)# bfd all-interfaces
```

### Related Commands

None

## 6.8.9 clear clns neighbors

### Command Purpose

Use this command to clear CLNS neighbor adjacencies.

### Command Syntax

clear clns neighbors

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The example shows how to clear CLNS neighbor adjacencies.:

```
Switch# clear clns neighbors
```

### Related Commands

None

## 6.8.10 clear clns is-neighbors

### Command Purpose

Use this command to clear IS neighbor adjacencies.

### Command Syntax

clear clns is-neighbors *System-ID*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| System-ID | Neighbor system ID in XXXX.XXXX.XXXX format. | hexadecimal |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The example shows how to clear IS neighbor adjacencies.:

```
Switch# clear clns is-neighbors 1234.789A.BCDF
```

### Related Commands

None

## 6.8.11 clear ip isis route

### Command Purpose

Use this command to clear IPv4 routes.

## Command Syntax

clear ip isis ( *INSTANCE* | ) route ( redistribution | all )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INSTANCE | Routing area tag. | Up to 20 characters |
| redistribution | Clear ISIS local redistribution routes. | - |
| all | Clear all of the ISIS routing table.s | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The example shows how to clear ISIS IPv4 routes.:

```
Switch# clear ip isis route all
```

## Related Commands

None

# 6.8.12 clear isis counter

## Command Purpose

Use this command to clear system-wide IS-IS counters

### Command Syntax

clear isis counter

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The example shows how to clear system-wide IS-IS counters.:

```
Switch# clear isis counter
```

### Related Commands

None

## 6.8.13 clear isis interface counter

### Command Purpose

Use this command to clear interface counters.

### Command Syntax

clear isis interface counter ( *IFNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | Interface name. | Support physical/aggregation/loopback/vlan/tunnel ports |

### Command Mode

Privileged EXEC

### Default

None

### Usage

If you do not specify a parameter, then counters for all interfaces are cleared.

### Examples

The example shows how to clear clear interface counters.:

```
Switch# clear isis interface counter
```

### Related Commands

None

## 6.8.14 clear isis process

### Command Purpose

Use this command to restart ISIS processes.

### Command Syntax

clear isis ( *INSTANCE* | ) process

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INSTANCE | Routing area tag. | Up to 20 characters |

### Command Mode

Privileged EXEC

## Default

None

## Usage

If you do not specify a parameter, then all ISIS processes are restarted.

## Examples

The example shows how to restart ISIS processes.:

```
Switch# clear isis process
```

## Related Commands

None

# 6.8.15 debug isis

## Command Purpose

Use this command to turn on debugging for specified criteria. Debug commands enable to show some debugging information about specified criteria into file or terminal.

Use the no parameter to turn off debugging for specified criteria.

## Command Syntax

debug isis ( all | )

debug isis ( authentication | bfd | checksum | events | hello ( interface *IFNAME* | *System-ID* | ) | ifsm | local-updates | lsp | nfsm | nsm | pdu | protocol-errors | spf )

no debug isis ( all | )

no debug all

no debug all isis

undebug all

undebug isis ( all | )

undebug all isis

no debug isis ( authentication | bfd | checksum | events | hello ( interface *IFNAME* | *System-ID* | ) | ifsm | local-updates | lsp | nfsm | nsm | pdu | protocol-errors | spf )

undebug isis ( authentication | bfd | checksum | events | hello ( interface *IFNAME* | *System-ID* | ) | ifsm | local-updates | lsp | nfsm | nsm | pdu | protocol-errors | spf )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| all | Enables all debugging. | - |
| authentication | Debugging for authentication. | - |
| checksum | Debugging for checksums. | - |
| bfd | Debugging for bidirectional forwarding detection. | - |
| events | Debugging for internal events. | - |
| hello | Debugging for hello processing. | - |
| interface | Interface. | - |
| IFNAME | Interface name. | Support physical/aggregation/loopback/vlan/tunnel ports |
| System-ID | System identifier. | - |
| ifsm | Debugging for interface finite state machine. | - |
| local-updates | Debugging for local updates. | - |
| lsp | Debugging for label switched path. | - |
| nfsm | Debugging for neighbor finite state machine. | - |
| nsm | Debugging for NSM messages. | - |
| pdu | Debugging for protocol data unit. | - |
| protocol-errors | Debugging for protocol errors. | - |

| | | |
|---|---|---|
| spf | Debugging for shortest path first route calculation. | - |

## Command Mode

Privileged EXEC

## Default

Disabled

## Usage

None

## Examples

The example shows how to enable all isis debugging.:

```
Switch# debug isis all
```

## Related Commands

None

# 6.8.16 default-information originate

## Command Purpose

Use this command to originate reachability information to Default destination into LSP.There is no default information in Level-2 domain by default, while Level-1 router calculates default to L1L2 route SPF calculation. This command enables to originate default route into Level-2 domain.

Use the no parameter with this command to withdraw reachability information to default destination from LSP.

## Command Syntax

default-information originate

no default-information originate

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| originate | Specify to distribute a default route | - |

## Command Mode

Router Configuration

Address Family Configuration

## Default

Disabled

## Usage

None

## Examples

The following example shows how to originate reachability information to Default destination into LSP both ipv4 and ipv6:

```
Switch# configure terminal
Switch(config)# router isis bb
Switch(config-router)# default-information originate
Switch(config-router)# address-family ipv6
Switch(config-router-af)# default-information originate
```

## Related Commands

None

# 6.8.17 distance

## Command Purpose

Use this command in router mode to set the administrative distance for all IPv4 routes.

Use the no parameter with this command to remove an administrative distance.

## Command Syntax

distance *DISTANCE* ( *System-ID* ( *ACL* | ) | )

no distance ( ( *System-ID* | *System-ID ACL* ) | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DISTANCE | Distance range. | 1-255 |
| System-ID | Source ID in XXXX.XXXX.XXXX format. | hexadecimal |
| ACL | Access-list name. | Up to 40 characters |

## Command Mode

Router Configuration

## Default

None

## Usage

None

## Examples

The following example shows how to set the administrative distance for all ISIS IPv4 routes:

```
Switch# configure terminal
Switch(config)# router isis
Switch(config-router)# distance 40
```

## Related Commands

None

# 6.8.18 domain-password

## Command Purpose

Use this command to set the authentication password for the Level-2 domain, and optionally, the authentication password on Level-2 SNP PDUs. Configuring this command to enable authentication when receiving and sending LSP and SNP PDU in Level-2 domain. Domain password must be the same in Level-2 domain.

Use the no parameter with this command to clear the domain password.

## Command Syntax

domain-password *PASSWORD*

domain-password *PASSWORD* authenticate snp ( send-only | validate )

no domain-password

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PASSWORD | The password string. | Up to 254 characters |
| authenticate | Inserts the password into Level-2 SNP PDUs. | - |
| snp | SNP PDUs. | - |
| send-only | Only inserts the password into the Level-2 SNP PDUs, but does not check the password in SNP PDUs that it receives. Use this keysword during a software upgrade to ease the transition. | - |
| validate | Inserts the password into the Level-2 SNP PDUs, and checks the password in SNP PDUs that it receives. | - |

## Command Mode

Router Configuration

## Default

By default, there is no domain password.

## Usage

None

## Examples

The following example shows how to set the authentication password for the Level-2 domain:

```
Switch# configure terminal
Switch(config)# router isis bb
Switch(config-router)# domain-password mypasswd

Switch(config-router)# no domain-password
```

## Related Commands

None

# 6.8.19 ignore-lsp-errors

## Command Purpose

Use this command to ignore LSPs with checksum errors. By default, validates checksum for LSP whenever it receives LSPs and if the checksum has an error, the LSP will be dropped. Configuring this command to ignore the LSP checksum error and treat it as if checksum is passed.

Use the no parameter to turn off this function.

## Command Syntax

ignore-lsp-errors

no ignore-lsp-errors

## Command Mode

Router Configuration

### Default

Disabled

### Usage

None

### Examples

The following example shows how to ignore LSPs with checksum errors:

```
Switch# configure terminal
Switch(config)# router isis bb
Switch(config-router)# ignore-lsp-errors
```

### Related Commands

None

## 6.8.20 ip route high-priority tag

### Command Purpose

Use this command to set a high priority tag value.

Use the no parameter to turn off this function.

### Command Syntax

ip route high-priority tag *TAG*

no ip route high-priority tag

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| TAG | Tag value | 1-4294967295 |

### Command Mode

Router Configuration

### Default

Disabled

### Usage

None

### Examples

The following example shows how to set a high priority tag value.:

```
Switch# configure terminal
Switch(config)# router isis A
Switch(config-router)# ip route high-priority tag 500
```

### Related Commands

None

## 6.8.21 ip router isis

### Command Purpose

Use this command to enable IPv4 routing on the interface. This command is mandatory to configuration. Match the instance tag to one of existing instance's tags, or a new instance with the tag name should be initiated, otherwise routing will not run on this interface.

Configuring this command, the router sends Hello with IP address TLV on this interface, and IP reachability information TLV in the LSP will be updated.

Use the no parameter with this command to disable IPv4 routing on the interface. This action does not clear the database. To clear the database, unconfigure the routing instance.

### Command Syntax

ip router isis ( *INSTANCE* | )

no ip router isis ( *INSTANCE* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INSTANCE | instance name. | Up to 20 characters |

## Command Mode

Interface Configuration

## Default

Disabled

## Usage

None

## Examples

The following example shows how to enable ISIS IPv4 routing on the interface:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ip router isis bb
```

## Related Commands

None

# 6.8.22 ipv6 router isis

## Command Purpose

Use this command to enable IPv6 routing on the interface. This command is mandatory to IPv6 configuration. Match the instance tag to one of existing instance's tags, or a new instance with the tag name should be initiated, otherwise routing will not run on this interface.

Configuring this command, the router sends Hello with IPv6 address TLV on this interface, and IPv6 reachability information TLV in the LSP will be updated.

Use the no parameter with this command to disable IPv6 routing on the interface.

## Command Syntax

ipv6 router isis ( *INSTANCE* | )

no ipv6 router isis ( *INSTANCE* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INSTANCE | instance name. | Up to 20 characters |

## Command Mode

Interface Configuration

## Default

Disabled

## Usage

None

## Examples

The following example shows how to enable ISIS IPv6 routing on the interface:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ipv6 router isis bb
```

## Related Commands

None

# 6.8.23 isis authentication key-chain

## Command Purpose

Use this command to set the key chain to be used for authentication on the interface-related packets.

Authentication mode must be set to md5 or text to configure the key chain. If no key chain is configured with the key-chain command, no key-chain authentication

is performed. Only one authentication key-chain is applied to an interface at a time. That is, issuing a second isis authentication key-chain command overrides the first isis authentication key-chain command.

If neither the level-1 nor level-2 keysword is configured, the key chain applies to the level(s) on which the authentication mode is configured as md5. Authentication can be specified for an entire, instead of at the interface level, by using the authentication key-chain command.

Use the no parameter with this command to unset the key chain used for authentication on the interface-related packets.

## Command Syntax

isis authentication key-chain *KEY_NAME* ( level-1 | level-2 | )

no isis authentication key-chain ( level-1 | level-2 | )

no isis authentication key-chain *KEY_NAME* ( level-1 | level-2 | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| KEY_NAME | Chain name - valid authentication keys. | A String of key chain name |
| level-1 | Specify an authentication key-chain for level-1 PDUs. | - |
| level-2 | Specify an authentication key-chain for level-2 PDUs. | - |

## Command Mode

Interface Configuration

## Default

Disabled

## Usage

The key chain applies to the level(s) on which authentication mode is configured as MD5 if no level is specified.

## Examples

The following example shows how to set the key chain to be used for authentication on the interface-related packets:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# isis authentication key-chain code1234 level-1
```

## Related Commands

None

# 6.8.24 isis authentication mode md5

## Command Purpose

Use this command to set the MD5 authentication mode. If clear text authentication was configured using the isis password command, the isis authentication mode command overrides the isis password command. If the isis authentication mode command was used, then subsequently an attempt is made to use the isis password command, the attempt fails.

To configure clear text authentication using the isis password command, first use the no isis authentication mode command. The type of authentication and the level to which it applies can be specified for the entire instance, rather than per interface, using the authentication mode command.

Use the no parameter with this command to unset the MD5 authentication mode.

## Command Syntax

isis authentication mode ( md5 | text ) ( level-1 | level-2 | )

no isis authentication mode ( md5 | text ) ( level-1 | level-2 | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| md5 | Keyed message digest | - |
| text | Text mode | - |
| level-1 | Specify an authentication key-chain for level-1 PDUs. | - |

| | | |
|---|---|---|
| level-2 | Specify an authentication key-chain for level-2 PDUs. | - |

## Command Mode

Interface Configuration

## Default

Disabled

## Usage

The send-only option applies to both levels if no level is specified.

## Examples

The following example shows how to set the MD5 authentication mode.:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# isis authentication mode md5
```

## Related Commands

None

# 6.8.25 isis authentication send-only

## Command Purpose

Use this command to set the send-only option to the interface-related packets.

Use this command before configuring the ISIS authentication mode and ISIS authentication key-chain, so that the implementation of authentication goes smoothly. That is, the routers will have more time for the keys to be configured on each router if authentication is inserted only on the packets being sent, not checked on packets being received.

After all routers that must communicate are configured with this command, enable the authentication mode and key chain on each router.

Use the no parameter with this command to unset the send-only option to the interface-related packets.

## Command Syntax

isis authentication send-only ( level-1 | level-2 | )

no isis authentication send-only ( level-1 | level-2 | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| level-1 | Specify an authentication key-chain for level-1 PDUs. | - |
| level-2 | Specify an authentication key-chain for level-2 PDUs. | - |

## Command Mode

Interface Configuration

## Default

Disabled

## Usage

The send-only option applies to both levels if no level is specified.

## Examples

The following example shows how to set the send-only option to the interface-related packets.:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# isis authentication send-only
```

## Related Commands

None

# 6.8.26 isis bfd

## Command Purpose

Use this command to enable/disable the BFD check on interface.

The isis bfd command allows a user to enable BFD on an interface. The isis bfd disable command disables BFD checking on an interface. However, the no isis bfd and no isis bfd disable commands both remove the enable/disable configuration, but do not disable/enable BFD.

The bfd all-interfaces command enables BFD on all interfaces attached to an instance then configuring. This command disables BFD configuration on a particular interface.

## Command Syntax

isis bfd ( disable | )

no isis bfd ( disable | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| disable | Specify to disable BFD. | - |

## Command Mode

Interface Configuration

## Default

Disabled

## Usage

None

## Examples

The following example shows how to disable bfd on ISIS interface.:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# isis bfd disable
```

## Related Commands

None

# 6.8.27 isis circuit-type

## Command Purpose

Use this command to set the circuit type for the interface.

If level-1 or level-2-only is specified in this command, sends only the specified level of PDUs.

Use the no parameter to reset circuit type to the default.

## Command Syntax

isis circuit-type ( level-1 | level-1-2 | level-2-only )

no isis circuit-type

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| level-1 | Specify that only Level-1 adjacencies are formed. | - |
| level-1-2 | Specify that Level-1-2 adjacencies are formed. | - |
| level-2-only | Specify that only Level-2 adjacencies are formed. | - |

## Command Mode

Interface Configuration

## Default

Eabled level-1 and level-2.

## Usage

None

## Examples

The following example shows how to set the circuit type for the interface:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# isis circuit-type level-2-only
```

## Related Commands

None

# 6.8.28 isis csnp-interval

## Command Purpose

Use this command to set CSNP (Complete sequence number PDU) interval in seconds.

Configuring this command changes the interval between two consecutive CSNP transmission. By default, CSNP is sent every 10 seconds only by LAN DIS. This parameter is only valid on broadcast interface, since periodic CSNP is only sent on broadcast interface, while CSNP on Point-to-Point interface is sent only when adjacency is initiated.

Use the no parameter with this command to reset CSNP interval to the default value.

## Command Syntax

isis csnp-interval *INTERVAL* ( level-1 | level-2 | )

no isis csnp-interval ( level-1 | level-2 | )

no isis csnp-interval <1-65535> ( level-1 | level-2 | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INTERVAL | Specify the CSNP interval in seconds. | 1-65535 |

| | | |
|---|---|---|
| level-1 | Specify Level-1 CSNP. | - |
| level-2 | Specify Level-2 CSNP. | - |

## Command Mode

Interface Configuration

## Default

10 seconds level-1 and level-2.

## Usage

None

## Examples

The following example shows how to set CSNP (Complete sequence number PDU) interval.:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# isis csnp-interval 20
```

## Related Commands

None

# 6.8.29 isis hello

## Command Purpose

Use this command to configure the padding of the Hello packet. pads the Hello packet by default to notify neighbors of the supported MTU size.

Use the no parameter with this command to disable the padding.

## Command Syntax

isis hello padding

no isis hello padding

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| padding | Specify pad hello packets | - |

## Command Mode

Interface Configuration

## Default

By default, pads the Hello packet.

## Usage

None

## Examples

The following example shows how to configure the padding of the Hello packet.:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# isis hello padding
```

## Related Commands

None

# 6.8.30 isis hello-interval

## Command Purpose

Use this command to set the Hello interval in seconds. The Hello-interval is set with the hello-multiplier (see isis hello-multiplier command).

Configuring this command changes the time interval between two consecutive Hello transmissions. If a device receives its own LSP with a maximum sequence number, then it suspends for the hold interval. DIS sends Hello transmissions at three times the rate than non-DIS. If is elected as DIS on this interface, sends Hello every 3.3 seconds.

If minimal keysword is specified, Holding timer in Hello PDU is set to 1 second and Hello interval is calculated by dividing by the hello-multiplier. For example, if the hello-multiplier is configured as 4 and hello-interval minimal is the command used, an Hello PDU is sent every 250 milliseconds.

Use the no parameter to set the Hello interval to the default.

## Command Syntax

isis hello-interval *INTERVAL* ( level-1 | level-2 | )

isis hello-interval minimal ( level-1 | level-2 | )

no isis hello-interval ( level-1 | level-2 | )

no isis hello-interval <1-65535> ( level-1 | level-2 | )

no isis hello-interval minimal ( level-1 | level-2 | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INTERVAL | Specify the hello interval in seconds. | 1-65535 |
| minimal | Specify the holding-time as 1 second. | - |
| level-1 | Specify Level-1 CSNP. | - |
| level-2 | Specify Level-2 CSNP. | - |

## Command Mode

Interface Configuration

## Default

By default, uses 10 seconds for the interval and the interval is applied to both level-1 and level-2.

## Usage

If neither the level-1 nor the level-2 keysword is configured, it applies to both levels.

## Examples

The following example shows how to set the Hello interval.:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# isis hello-interval 5 level-1
```

## Related Commands

isis hello-multiplier

# 6.8.31 isis hello-multiplier

## Command Purpose

Use this command to set multiplier for Hello holding time.

Changes Holding Timer in Hello PDU. Holding timer is calculated by "Hello-Interval" multiplied by this value. If minimal keysword is specified with the Hello-Interval, the holding timer is set to 1 second and the hello-interval is calculated by dividing 1 by this value.

Use the no parameter with this command to set multiplier to the default.

## Command Syntax

isis *hello-MULTIPLIER* <2-100> ( level-1 | level-2 | )

no isis hello-multiplier ( level-1 | level-2 | )

no isis hello-multiplier <2-100> ( level-1 | level-2 | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MULTIPLIER | Specify a hello multiplier value. | 2-100 |
| level-1 | Specify Level-1 hello. | - |
| level-2 | Specify Level-2 hello. | - |

## Command Mode

Interface Configuration

### Default

By default, uses 3 seconds for the multiplier value and the multiplier is applied to both level-1 and level-2.

### Usage

If neither the level-1 nor the level-2 keysword is configured, it applies to both levels.

### Examples

The following example shows how to set multiplier for Hello holding time:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# isis hello-multiplier 4
```

### Related Commands

None

## 6.8.32 isis lsp-interval

### Command Purpose

Use this command to set the Link State Packet (LSP) transmission interval.

Configuring this command changes the minimum interval between two consecutive LSP transmission. When flooding or some other event triggers LSP to transmit, the LSP is put on the interface queue and scheduled to transmit according to this interval. Two consecutive LSP transmissions are scheduled to have at least this interval.

Use the no parameter with this command to set LSP transmission interval to the default.

### Command Syntax

isis lsp-interval *INTERVAL*

no isis lsp-interval

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| INTERVAL | Specify an LSP transmission interval in milliseconds. | 1-4294967295 |

## Command Mode

Interface Configuration

## Default

By default, 33 milliseconds for the interval.

## Usage

None

## Examples

The following example shows how to set the Link State Packet (LSP) transmission interval:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# isis lsp-interval 100
```

## Related Commands

None

# 6.8.33 isis mesh-group

## Command Purpose

Use this command to set Mesh Group ID on the current interface.

Use the no parameter to unset mesh group on the current interface.

## Command Syntax

isis mesh-group *MESH_GROUP*

isis mesh-group blocked

no isis mesh-group

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MESH_GROUP | Specify a mesh group number | 1-4294967295 |
| blocked | Specify to block LSPs on the current interface. If an interface is configured as "mesh group blocked," the standard LSP database synchronization process is applied if the interface receives CSNP or PSNP. | - |

## Command Mode

Interface Configuration

## Default

By default, mesh groups are not enabled on this interface.

## Usage

None

## Examples

The following example shows how to set Mesh Group ID on the current interface :

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# isis mesh-group 20
```

## Related Commands

None

# 6.8.34 isis metric

## Command Purpose

Use this command to set default metric for the interface. The interface default metric is put into IP reachability information TLVs, IS reachability information TLVs and IPv6 reachability TLVs in LSPs. The value is used for SPF calculation.

Use the no parameter with this command to set default metric to the default.

## Command Syntax

isis metric *METRIC* ( level-1 | level-2 | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| METRIC | Specify a default metric. | 1-16777214 |
| level-1 | Specify default metric for level-1 circuit. | - |
| level-2 | Specify default metric for level-2 circuit. | - |

## Command Mode

Interface Configuration

## Default

By default, uses 10 for the metric value and the value is applied to both level-1 and level-2.

## Usage

If neither the level-1 nor the level-2 keysword is configured, it applies to both levels.

## Examples

The following example shows how to set default metric for the interface:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# isis metric 20
```

### Related Commands

None

## 6.8.35 isis network

### Command Purpose

Use this command to change a broadcast interface network type to a point-to-point network type.

Use the no parameter with this command to revert to the default setting of a broadcast interface network type.

### Command Syntax

isis network point-to-point

no isis network ( point-to-point | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| point-to-point | Specify a point-to-point network. | - |

### Command Mode

Interface Configuration

### Default

This option is disabled by default.

### Usage

None

## Examples

The following example shows how to change a broadcast interface network type to a point-to-point network type:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# isis network point-to-point
```

## Related Commands

None

# 6.8.36 isis password

## Command Purpose

Use this command to set the authentication password of Hello PDU on the interface.

Use the no parameter to clear the password.

## Command Syntax

isis password *PASSWORD* ( level-1 | level-2 | )

no isis password ( level-1 | level-2 | )

no isis password *PASSWORD* ( level-1 | level-2 | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PASSWORD | Specify a password string. | Up to 254 characters |
| level-1 | Specify a password for Level-1 hello PDUs. | - |
| level-2 | Specify a password for Level-2 hello PDUs. | - |

## Command Mode

Interface Configuration

## Default

By default, no password is configured; this applies to both level-1 and level-2.

## Usage

If neither the level-1 nor the level-2 keysword is configured, it applies to both levels.

## Examples

The following example shows how to set the authentication password of Hello PDU on the interface:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# isis password mypassWORD level-1
```

## Related Commands

None

# 6.8.37 isis prefix-sid

## Command Purpose

Use this command to set the IS-IS prefix sid.

## Command Syntax

isis prefix-sid index *INDEX* ( n-flag-clear | ) ( explicit-null | )

no isis prefix-sid

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INDEX | Specify a value for prefix sid. | 0-1048575 |
| n-flag-clear | Clear the Node-SID flag. | - |
| explicit-null | Set the Explicit-Null flag to inform the upstream neighbor to use the explicit null instead of prefix sid. | - |

## Command Mode

Interface Configuration

### Default

The prefix sid is not configured by default.

### Usage

The index value can not exceed the range of the srgb.

### Examples

The following example shows how to set the prefix sid.:

```
Switch# configure terminal
Switch(config)# interface loopback 0
Switch(config-if)# isis prefix-sid index 10
```

### Related Commands

None

## 6.8.38 isis priority

### Command Purpose

Use this command to set the priority for LAN DIS election. This command changes the priority value in LAN Hello PDUs. A lower priority value is less preferred in DIS election, and a higher priority value is more preferred.

### Command Syntax

isis priority *PRIORITY* ( level-1 | level-2 | )

no isis priority ( level-1 | level-2 | )

no isis priority <0-127> ( level-1 | level-2 | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PRIORITY | Priority value | 0-127 |
| level-1 | Specify a priority for Level-1 hello PDUs. | - |
| level-2 | Specify a priority for Level-2 hello PDUs. | - |

### Command Mode

Interface Configuration

### Default

By default, uses 64 for the priority value, and the priority is applied to both level-1 and level-2.

### Usage

If neither the level-1 nor the level-2 keysword is configured, it applies to both levels.

### Examples

The following example shows how to set the priority for LAN DIS election:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# isis priority 127
```

### Related Commands

None

## 6.8.39 isis retransmit-interval

### Command Purpose

Use this command to set LSP retransmission interval.

Use the no parameter to set the interval to the default.

### Command Syntax

isis retransmit-interval *INTERVAL*

no isis retransmit-interval

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| INTERVAL | Specify an interval for retransmission of the same LSP in seconds. | 0-65535 |

## Command Mode

Interface Configuration

## Default

5 seconds.

## Usage

None

## Examples

The following example shows how to set LSP retransmission interval:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# isis retransmit-interval 10
Switch(config-if)# no isis retransmit-interval
```

## Related Commands

None

# 6.8.40 isis tag

## Command Purpose

Use this command to set the tag for link-state packets (LSPs) sent out advertising routes for networks directly connected to an interface.

If you do not specify a parameter, then the tag value is set for level-1-2 boundary.

Use the no parameter to unset the tag.

## Command Syntax

isis tag *TAG* ( level-1 | level-2 | )

no isis tag

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| TAG | Tag value. | 1-4294967295 |
| level-1 | Specify the tag value for the level-1 boundary. | - |
| level-2 | Specify the tag value for the level-2 boundary. | - |

## Command Mode

Interface Configuration

## Default

This option is disabled by default.

## Usage

None

## Examples

The following example shows how to the tag for link-state packets (LSPs) sent out advertising routes for networks directly connected to an interface.:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# isis tag 500 level-1
```

## Related Commands

None

# 6.8.41 ispf

## Command Purpose

Use this command to enable incremental SPF for a routing process.

Use the no parameter to disable incremental SPF from a routing process.

## Command Syntax

ispf

ispf ( level-1 | level-1-2 | level-2-only )

no ispf

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| level-1 | Act as level-1 only IS. | - |
| level-1-2 | Act as level-1-2 IS. | - |
| level-2-only | Act as level-2 only IS. | - |

## Command Mode

Router Configuration

## Default

None

## Usage

None

## Examples

The following example shows how to enable incremental SPF for a routing process:

```
Switch# configure terminal
Switch(config)# router isis bb
Switch(config-router)# ispf level-1
```

### Related Commands

None

## 6.8.42 is-type

### Command Purpose

To configure the routing level for an instance of the Intermediate System-to-Intermediate System (IS-IS) routing process, use the is-type command in router configuration mode.

Use the no parameter to set the IS to the default.

### Command Syntax

is-type ( level-1 | level-1-2 | level-2-only )

no is-type

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| level-1 | Act as level-1 only IS. | - |
| level-1-2 | Act as level-1-2 IS. | - |
| level-2-only | Act as level-2 only IS. | - |

### Command Mode

Router Configuration

### Default

By default, uses level-1-2 if there is no Level-2 instance nor a Level-1-2 instance. Otherwise, it uses level-1.

### Usage

None

### Examples

The following example shows how to configure the routing level for an ISIS instance:

```
Switch# configure terminal
Switch(config)# router isis bb
Switch(config-router)# is-type level-1
```

### Related Commands

None

## 6.8.43 lsp-gen-interval

### Command Purpose

Use this command to set minimum interval before regenerating the same LSP. The smaller the interval, the faster the convergence. However, this setting might cause more frequent flooding.

Use the no parameter with this command to set the interval to the default.

### Command Syntax

lsp-gen-interval *INTERVAL*

lsp-gen-interval ( level-1 | level-2 ) <1-120>

no lsp-gen-interval

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INTERVAL | Specify a minimum interval in seconds. | 1-120 |
| level-1 | Specify an interval for Level-1 IS. | - |
| level-2 | Specify an interval for Level-2 IS. | - |

### Command Mode

Router Configuration

### Default

30 seconds for the interval and the interval is applied to both level-1 and level-2.

## Usage

None

## Examples

The following example shows how to set minimum interval before regenerating the same LSP:

```
Switch# configure terminal
Switch(config)# router isis bb
Switch(config-router)# lsp-gen-interval 5
```

## Related Commands

None

# 6.8.44 lsp-mtu

## Command Purpose

Use this command to set LSP MTU in bytes.

Use the no parameter with this command to set the MTU to the default.

## Command Syntax

lsp-mtu ( level-1 | level-2 | ) *MTU*

no lsp-mtu ( level-1 | level-2 | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MTU | Specify an MTU size | 512-1492 |
| level-1 | Specify an interval for Level-1 IS. | - |
| level-2 | Specify an interval for Level-2 IS. | - |

## Command Mode

Router Configuration

### Default

None

### Usage

If neither the level-1 nor the level-2 keysword is configured, it applies to both levels.

### Examples

The following example shows how to set LSP MTU in bytes:

```
Switch# configure terminal
Switch(config)# router isis bb
Switch(config-router)# lsp-mtu 555
```

### Related Commands

None

## 6.8.45 lsp-refresh-interval

### Command Purpose

Use this command to set the LSP refresh interval.

IP Infusion recommends making the lsp-refresh-interval smaller than max-lsp-lifetime value.

Use the no parameter to set the interval to the default value.

### Command Syntax

lsp-refresh-interval *INTERVAL*

no lsp-refresh-interval

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INTERVAL | Specify an LSP refresh interval in seconds. | 1-65535 |

### Command Mode

Router Configuration

### Default

900 seconds.

### Usage

None

### Examples

The following example shows how to set the LSP refresh interval:

```
Switch# configure terminal
Switch(config)# router isis bb
Switch(config-router)# lsp-refresh-interval 600

Switch(config-router)# no lsp-refresh-interval
```

### Related Commands

None

## 6.8.46 max-area-addresses

### Command Purpose

Use this command to configure additional manual addresses for an IS-IS area.

Use the no parameter to disable the manual addresses.

### Command Syntax

max-area-addresses *NUMBER*

no max-area-addresses

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NUMBER | Specify the maximum area address that can be supported | 3-127 |

## Command Mode

Router Configuration

## Default

3

## Usage

None

## Examples

The following example shows how to configure additional manual addresses for an IS-IS area:

```
Switch# configure terminal
Switch(config)# router isis bb
Switch(config-router)# max-area-address 4
```

## Related Commands

None

# 6.8.47 max-lsp-lifetime

## Command Purpose

Use this command to set the maximum LSP lifetime. You must set max-lsp-lifetime greater than lsp-refreshinterval.

Use the no parameter to set the lifetime to the default.

## Command Syntax

max-lsp-lifetime *LIFETIME*

no max-lsp-lifetime

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LIFETIME | Specify an maximum LSP lifetime in seconds. | 350-65535 |

## Command Mode

Router Configuration

## Default

1200 seconds.

## Usage

None

## Examples

The following example shows how to set the maximum LSP lifetime:

```
Switch# configure terminal
Switch(config)# router isis bb
Switch(config-router)# max-lsp-lifetime 1500
```

## Related Commands

None

# 6.8.48 metric-style

## Command Purpose

Use this command to configure the metric style.

Use the no parameter to set the style to the default style, narrow.

## Command Syntax

metric-style ( narrow | wide | transition ) ( level-1 | level-1-2 | level-2 | )

metric-style ( narrow | wide ) transition ( level-1 | level-1-2 | level-2 | )

no metric-style ( narrow | wide | transition ) ( level-1 | level-1-2 | level-2 | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| narrow | Specify the old style of TLVs with narrow metric. | - |
| wide | Specify the new style of TLVs to carry wider metric. | - |
| transition | Accept both styles of TLVs during transition | - |
| level-1 | Specify the level-1 metric style. | - |
| level-2 | Specify the level-2 metric style. | - |
| level-1-2 | Specify the level-1-2 metric style. | - |

## Command Mode

Router Configuration

## Default

By default, uses narrow metric style for level 1 and 2.

## Usage

None

## Examples

The following example shows how to configure the metric style:

```
Switch# configure terminal
Switch(config)# router isis bb
Switch(config-router)# metric-style wide
```

## Related Commands

None

# 6.8.49 net

## Command Purpose

Use this command to configure an Intermediate System-to-Intermediate System (IS-IS) network entity title (NET) for the routing process, use the net command in router configuration mode. To remove a NET, use the no form of this command.

Use the no parameter to remove the NET.

## Command Syntax

net *NET*

no net *NET*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NET | Specify a network entity title (NET) in 1 to 13 octets | In XX.XXXX. ... .XXXX.XX format |

## Command Mode

Router Configuration

## Default

By default, does not configure a NET and routing is not enabled for the interface.

## Usage

None

## Examples

The following example shows how to configure an Intermediate System-to-Intermediate System (IS-IS) network entity title (NET) for the routing process:

```
Switch# configure terminal
Switch(config)# router isis bb
Switch(config-router)# net 49.0000.0001.0002.0003.00
```

### Related Commands

None

## 6.8.50 passive-interface

### Command Purpose

Use this command to suppress routing updates on all interfaces or on a specified interface, which puts the interfaces into passive mode. To advertise passive prefixes in LSP, there is no need to have at an interface configured with ip router isis. Enabling passive interface on an ISIS enabled interface disables ISIS on the interface and makes the interface passive.

Use the no parameter with this command to remove interfaces from passive mode

### Command Syntax

passive-interface ( *IFNAME* | )

no passive-interface ( *IFNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | Indicates an interface name. | Support physical/aggregation/loopback/vlan/tunnel ports |

### Command Mode

Router Configuration

### Default

None

### Usage

None

## Examples

The following example shows how to suppress routing updates on a specified interface:

```
Switch# configure terminal
Switch(config)# router isis 100
Switch(config-router)# passive-interface eth-0-1
```

## Related Commands

None

# 6.8.51 prc-interval-exp

## Command Purpose

Use this command to configure exponential back-off delay between PRC calculations.

Use the no parameter to disable any set exponential back-off delay between PRC calculations.

## Command Syntax

prc-interval-exp

prc-interval-exp *EXP_MIN EXP_MAX*

no prc-interval-exp

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| EXP_MIN | Set the minimum delay between receiving a change to PRC calculation in milliseconds. | 0-2147483647 |
| EXP_MAX | Set the maximum delay between receiving a change to PRC calculation in milliseconds. | 0-2147483647 |

## Command Mode

Router Configuration

## Default

Minimum Delay 500ms，Maximum Delay 50000ms

## Usage

None

## Examples

The following example shows how to configure exponential back-off delay between PRC calculations:

```
Switch# configure terminal
Switch(config)# router isis
Switch(config-router)# prc-interval-exp 100 10000
```

## Related Commands

None

# 6.8.52 redistribute

## Command Purpose

Use this command to redistribute routes from another protocol into the ISIS routing table.

Use the no parameter to disable this function.

## Command Syntax

redistribute ( connected | static | rip | ospf | bgp ) { metric *METRIC* | metrictype ( internal | external ) | level-1 | level-2 | level-1-2 | route-map *ROUTE_MAP* }

no redistribute ( connected | static | rip | ospf | bgp )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| connected | Redistribute connected routes. | - |
| static | Redistribute static routes. | - |
| rip | Redistribute RIP routes. | - |

| | | |
|---|---|---|
| ospf | Redistribute OSPF routes. | - |
| bgp | Redistribute BGP routes. | - |
| metric | Specify the metric for redistributed routes. | - |
| METRIC | Specify the IS-IS default metric. | 0-4261412864 |
| metric-type | Specify the IS-IS exterior metric type for redistributed routes: | - |
| internal | Set IS-IS internal metric type. | - |
| external | Set IS-IS external metric type. | - |
| level-1 | IS-IS Level-1 routes. | - |
| level-2 | IS-IS Level-2 routes. | - |
| level-1-2 | IS-IS Level-1 and Level-2 routes. | - |
| route-map | Specify a Route map reference. | - |
| ROUTE_MAP | Specify name of the route-map. | Up to 20 characters |

## Command Mode

Router Configuration

## Default

None

## Usage

None

## Examples

The following example shows how to redistribute routes from another protocol into the ISIS routing table:

```
Switch# configure terminal
Switch(config)# router isis A
Switch(config-router)# redistribute bgp metric 12
```

## Related Commands

None

# 6.8.53 redistribute isis

## Command Purpose

Use this command to redistribute reachability information from one level to the other level. If an distribute-list name is given with this command for an access list that does not exist, the routes are still redistributed.

Use the no parameter with this command to stop redistribution.

## Command Syntax

redistribute isis level-1 into level-2

redistribute isis level-2 into level-1

redistribute isis level-1 into level-2 distribute-list *ACL*

redistribute isis level-2 into level-1 distribute-list *ACL*

no redistribute isis level-1 into level-2

no redistribute isis level-2 into level-1

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| level-1 | Specify an inter-area route level-1. | - |
| level-2 | Specify an inter-area routes level-2. | - |
| into | Specify a from level-n level into level-m. | - |
| distribute-list | Indicate the distributed-list parameter. | - |
| ACL | Access-list name | Up to 40 characters |

## Command Mode

Router Configuration

Address Family Configuration

### Default

By default, redistributes selected level-1 routes into level-2

### Usage

None

### Examples

The following example shows how to redistributes level-2 routes into level-1:

```
Switch# configure terminal
Switch(config)# router isis bb
Switch(config-router)# redistribute isis level-2 into level-1
```

### Related Commands

None

## 6.8.54 router isis

### Command Purpose

Use this command in global configuration mode to enable the Intermediate System-to-Intermediate System (IS-IS) routing protocol and to specify an IS-IS process. To disable IS-IS routing, use the noform of this command.

Use the no parameter with this command to disable IS-IS routing.

### Command Syntax

router isis ( *INSTANCE* | )

no router isis ( *INSTANCE* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INSTANCE | Specify an ISO routing instance tag. | Up to 20 characters |

### Command Mode

Global Configuration

### Default

None

### Usage

None

### Examples

The following example shows how to set ISIS instance name and create it:

```
Switch# configure terminal
Switch(config)# router isis New
```

### Related Commands

None

## 6.8.55 segment-routing mpls

### Command Purpose

Use this command in router mode to enable segment routing in IS-IS. Use the no parameter with this command to disable IS-IS segment routing.

### Command Syntax

segment-routing mpls

no segment-routing mpls

### Command Mode

Router Configuration

### Default

By default, segment routing is disabled in IS-IS.

### Usage

None

### Examples

The following example shows how to enable segment routing in IS-IS:

```
Switch# configure terminal
Switch(config)# router isis
Switch(config-router)# segment-routing mpls
```

### Related Commands

None

## 6.8.56 segment-routing global-block

### Command Purpose

Use this command in router mode to set the range for segment routing global block.

### Command Syntax

segment-routing global-block *MIN_VAL MAX_VAL*

no segment-routing global-block

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MIN_VAL | Specify the minimum value for the srgb. | 16000-23999 |
| MAX_VAL | Specify the maximum value for the srgb. | 16000-23999 |

### Command Mode

Router Configuration

### Default

By default, use 16000 to 23999 for the SRGB range.

## Usage

None

## Examples

The following example shows how to set the SRGB range:

```
Switch# configure terminal
Switch(config)# router isis
Switch(config-router)# segment-routing global-block 18000 19000
```

## Related Commands

None

# 6.8.57 set-overload-bit

## Command Purpose

To configure the router to signal other routers not to use it as an intermediate hop in their shortest path first

(SPF) calculations, use the set-overload-bit command in router configuration mode. To remove the designation,

use the noform of this command.

## Command Syntax

set-overload-bit ( { suppress ( external | interlevel | external interlevel | interlevel external ) | on-startup ( *TIME* | wait-for-bgp ) } | )

no set-overload-bit

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| suppress | Specify to suppress specific types of IP prefixes. | - |

| | | |
|---|---|---|
| external | Specify to redistribute external reachability (to prevent the IP prefixes learned from other protocols from being advertised). | - |
| interlevel | Specify to redistribute interlevel reachability. | - |
| on-startup | Specify an interval in seconds after which the overload state is exited. | - |
| TIME | Specify the time in seconds to advertise one self as overloaded after reboot. | 5-86400 |
| wait-for-bgp | Specify that BGP determines when to unset the overload bit. | - |

## Command Mode

Router Configuration

## Default

By default, no overload-bit is set.

## Usage

None

## Examples

The following example shows how to set overload bit:

```
Switch# configure terminal
Switch(config)# router isis bb
Switch(config-router)# set-overload-bit
```

## Related Commands

None

# 6.8.58 spf-interval-exp

## Command Purpose

Use this command to set the minimum and maximum hold intervals between Shortest Path First (SPF) calculations.

The spf-interval-exp command configures the minimum and maximum interval time between the receipt of a topology change and the calculation of the SPF.

Use the no parameter with this command to set the minimum and maximum hold intervals to the default.

## Command Syntax

spf-interval-exp *EXP_MIN EXP_MAX*

spf-interval-exp ( level-1 | level-2 ) <0-2147483647> <0-2147483647>

no spf-interval-exp

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| EXP_MIN | Specify the minimum delay between receiving a change to the SPF calculation in milliseconds. | 0-2147483647 |
| EXP_MAX | Specify the maximum delay between receiving a change to the SPF calculation in milliseconds. | 0-2147483647 |
| level-1 | Specify an interval for Level-1 IS. | - |
| level-2 | Specify an interval for Level-2 IS. | - |

## Command Mode

Router Configuration

### Default

By default, uses 500 milliseconds and 50,000 milliseconds for the minimum and maximum hold intervals, respectively. The values are applied to both level-1 and level-2 if the level parameter is omitted.

### Usage

None

### Examples

The following example shows how to set the minimum and maximum hold intervals between Shortest Path First (SPF) calculations:

```
Switch# configure terminal
Switch(config)# router isis bb
Switch(config-router)# spf-interval-exp level-1 600 60000
Switch(config-router)# no spf-interval-exp level-1
```

### Related Commands

None

## 6.8.59 summary-address

### Command Purpose

Use this command to configure Summary Address to summarize IPv4 reachability information.

Use the no parameter with this command to unconfigure the summary.

### Command Syntax

summary-address *IP_ADDR/IP_MASK_LEN* ( level-1 | level-1-2 | level-2 | ) ( metric ) ( *METRIC* | )

no summary-address *IP_ADDR/IP_MASK_LEN*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IP_ADDR/IP_MASK_LEN | Specify the IPv4 prefix to be announced. | IPv4 Address and mask length in A.B.C.D/M format |
| level-1 | Specify the reachability information only for Level-1. | - |
| level-1-2 | Specify the reachability information for both Level-1 and Level-2. | - |
| level-2 | Specify the reachability information only for Level-2. | - |
| metric | Specify the metric for the summarized address. | - |
| METRIC | Specify the metric. The default is 0. | 1-4294967295 |

## Command Mode

Router Configuration

## Default

By default, does not configure the summary-address. Summary-address is applied to Level-2 IS if level parameter is omitted.

## Usage

If neither the level-1 nor the level-2 keysword is configured, it applies to level-2

## Examples

The following example shows how to configure ipv4 Summary Address:

```
Switch# configure terminal
Switch(config)# router isis bb
Switch(config-router)# summary-address 10.10.0.0/16
```

## Related Commands

None

# 6.8.60 summary-prefix

## Command Purpose

Use this command to configure the summary prefix to summarize IPv6 reachability information.

Use the no parameter to unconfigure the summary.

## Command Syntax

summary-prefix *GLOBAL_PREFIX/IPV6_MASK_LEN* ( level-1 | level-1-2 | level-2 | ) ( metric *METRIC* )

no summary-prefix *GLOBAL_PREFIX/IPV6_MASK_LEN*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| GLOBAL_PREFIX/IPV6_MASK_LEN | Specify the IPv6 prefix to be announced. | IPv4 Address and mask length in X:X::X:X/M format |
| level-1 | Specify the reachability information only for Level-1. | - |
| level-1-2 | Specify the reachability information for both Level-1 and Level-2. | - |
| level-2 | Specify the reachability information only for Level-2. | - |
| metric | Specify the metric for the summarized address. | - |
| METRIC | Specify the metric. The default is 0. | 1-4294967295 |

## Command Mode

Address Family Configuration

## Default

By default, does not configure the summary-prefix. Summary-prefix is applied to Level-2 IS if level parameter is omitted.

## Usage

If neither the level-1 nor the level-2 keysword is configured, it applies to level-2

## Examples

The following example shows how to configure ipv6 Summary Prefix:

```
Switch# configure terminal
Switch(config)# router isis bb
Switch(config-router)# address-family ipv6
Switch(config-router-af)# summary-prefix 3ffe:1234::/32
```

## Related Commands

None

# 6.8.61 show clns is-neighbors

## Command Purpose

Use this command to display all IS neighbor adjacencies.

## Command Syntax

show clns is-neighbors ( detail | )

show clns *INSTANCE* is-neighbors ( detail | )

show clns is-neighbors *IFNAME* ( detail | )

show clns *INSTANCE* is-neighbors *IFNAME* ( detail | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INSTANCE | Display information for specified instance. | Up to 20 characters |
| IFNAME | Display information about a single interface. | Support physical/aggregation/loopback/vlan/tunnel ports |
| detail | Display detailed information for all interfaces. | - |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following example shows how to display all IS neighbor adjacencies:

```
Switch# show clns is-neighbors
Area 100:
System Id      Interface   State  Type Priority  Circuit Id
0000.0000.0002 vlan100     Up     L2   64        0000.0000.0001.01
0000.0000.0002 vlan200     Up     L2   64        0000.0000.0001.02
```

### Related Commands

None

## 6.8.62 show debugging isis

### Command Purpose

Use this command to display the status of the debugging of the ISIS system.

### Command Syntax

show debugging isis

### Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following example shows how to display the status of the debugging of the ISIS system:

```
Switch# show debugging isis
IS-IS debugging status:
  IS-IS spf debugging is on
```

## Related Commands

None

# 6.8.63 show ip isis route

## Command Purpose

Use this command to display IS-IS routing table for IPv4.

## Command Syntax

show ip isis ( *INSTANCE* | ) route

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INSTANCE | Display information for specified instance. | Support physical/aggregation/loopback/vlan/tunnel ports |

## Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following example shows how to display IS-IS routing table for IPv4.:

```
Switch# show ip isis route
```

### Related Commands

None

## 6.8.64 show ipv6 isis route

### Command Purpose

Use this command to display the IS-IS routing table for IPv6.

### Command Syntax

show ipv6 isis ( *INSTANCE* | ) route

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INSTANCE | Display information for specified instance. | Up to 20 characters |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following example shows how to display IS-IS routing table for IPv6.:

```
Switch# show ipv6 isis route
```

### Related Commands

None

## 6.8.65 show ipv6 isis topology

### Command Purpose

Use this command to display the IS-IS topology for IPv6.

### Command Syntax

show ipv6 isis topology ( l1 | l2 | level-1 | level-2 | )

show ipv6 isis *INSTANCE* topology ( l1 | l2 | level-1 | level-2 | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INSTANCE | Display information for specified instance. | Up to 20 characters |
| l1 | IS-IS level-1 SPF topology. | - |
| l2 | IS-IS level-2 SPF topology. | - |
| level-1 | IS-IS level-1 SPF topology. | - |
| level-2 | IS-IS level-2 SPF topology. | - |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following example shows how to display the IS-IS topology for IPv6:

```
Switch# show ipv6 isis topology
```

### Related Commands

None

## 6.8.66 show ipv6 protocols isis

### Command Purpose

Use this command to display IPv6 process parameters and statistics.

### Command Syntax

show ipv6 protocols isis

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following example shows how to display IPv6 process parameters and statistics.:

```
Switch# show ipv6 protocols isis
Routing Protocol is "isis 2 "
 Redistributing:
  Area Address(es):
Distance : (default is 115)
Routing Protocol is "isis 1 "
 Redistributing:
  Area Address(es):
Distance : (default is 115)
```

### Related Commands

None

## 6.8.67 show isis counter

### Command Purpose

Use this command to display the IS-IS system counter entry MIBs.

### Command Syntax

show isis counter

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following example shows how to display the IS-IS system counter entry MIBs.:

```
Switch# show isis counter
Area b:
IS-IS Level-1 isisSystemCounterEntry:
  isisSysStatCorrLSPs: 0
```

```
  isisSysStatAuthTypeFails: 0
  isisSysStatAuthFails: 0
  isisSysStatLSPDbaseOloads: 0
  isisSysStatManAddrDropFromAreas: 0
  isisSysStatAttmptToExMaxSeqNums: 0
  isisSysStatSeqNumSkips: 0
  isisSysStatOwnLSPPurges: 0
  isisSysStatIDFieldLenMismatches: 0
  isisSysStatMaxAreaAddrMismatches: 0
  isisSysStatPartChanges: 0
  isisSysStatSPFRuns: 0
  isisSysStatPRCRuns: 0
Area bb:
IS-IS Level-1 isisSystemCounterEntry:
  isisSysStatCorrLSPs: 0
  isisSysStatAuthTypeFails: 0
  isisSysStatAuthFails: 0
  isisSysStatLSPDbaseOloads: 0
  isisSysStatManAddrDropFromAreas: 0
  isisSysStatAttmptToExMaxSeqNums: 0
  isisSysStatSeqNumSkips: 0
  isisSysStatOwnLSPPurges: 0
  isisSysStatIDFieldLenMismatches: 0
  isisSysStatMaxAreaAddrMismatches: 0
  isisSysStatPartChanges: 0
  isisSysStatSPFRuns: 0
  isisSysStatPRCRuns: 0
IS-IS Level-2 isisSystemCounterEntry:
  isisSysStatCorrLSPs: 0
  isisSysStatAuthTypeFails: 0
  isisSysStatAuthFails: 0
  isisSysStatLSPDbaseOloads: 0
  isisSysStatManAddrDropFromAreas: 0
  isisSysStatAttmptToExMaxSeqNums: 0
  isisSysStatSeqNumSkips: 0
  isisSysStatOwnLSPPurges: 0
  isisSysStatIDFieldLenMismatches: 0
  isisSysStatMaxAreaAddrMismatches: 0
  isisSysStatPartChanges: 0
  isisSysStatSPFRuns: 0
  isisSysStatPRCRuns: 0
```

### Related Commands

None

## 6.8.68 show isis database

### Command Purpose

Use this command to display detailed link state database information.

## Command Syntax

show isis database

show isis database ( l1 | l2 | level-1 | level-2 ) *LSPID* ( detail | verbose )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| detail | IS-IS link state database detailed information. | - |
| verbose | IS-IS link state database detailed information. | - |
| LSPID | LSPID in the form of XXXX.XXXX.XXXX.XX-XX. | - |
| l1 | IS-IS level-1 link state database. | - |
| l2 | IS-IS level-2 link state database. | - |
| level-1 | IS-IS level-1 link state database. | - |
| level-2 | IS-IS level-2 link state database. | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following example shows how to display detailed link state database information.:

```
Switch# show isis database verbose
Area (null):
IS-IS Level-1 Link State Database:
LSPID                 LSP Seq Num  LSP Checksum  LSP Holdtime      ATT/P/OL
0000.0000.0001.00-00* 0x00000002   0x9E50        1140              0/0/0
```

```
IS-IS Level-2 Link State Database:
LSPID                 LSP Seq Num  LSP Checksum  LSP Holdtime      ATT/P/OL
0000.0000.0001.00-00* 0x00000003   0x9C51        1176              0/0/0
```

### Related Commands

None

## 6.8.69 show isis interface

### Command Purpose

Use this command to display detailed interface information.

### Command Syntax

show isis interface

show isis interface *IFNAME*

show isis interface counter

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | Display the name of interface. | Support physical/aggregation/loopback/vlan/tunnel ports |
| counter | Display the interface counters. | - |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

## Examples

The following example shows how to display detailed interface information about ISIS:

```
Switch# show isis interface eth-0-1
eth-0-1 is up, line protocol is up
  Routing Protocol: IS-IS ((null))
    Network Type: Broadcast
    Circuit Type: level-1-2
    Local circuit ID: 0x01
    Extended Local circuit ID: 0x00000001
    Local SNPA: e6f5.41de.3200
    IP interface address:
      1.1.1.1/24
    IPv6 interface address:
    Level-1 Metric: 10/10, Priority: 64, Circuit ID: 0000.0000.0001.01
    Number of active level-1 adjacencies: 0
    Level-1 LSP MTU: 1492
    Level-2 Metric: 10/10, Priority: 64, Circuit ID: 0000.0000.0001.01
    Number of active level-2 adjacencies: 0
    Level-2 LSP MTU: 1492
    Next IS-IS LAN Level-1 Hello in 238 milliseconds
    Next IS-IS LAN Level-2 Hello in 238 milliseconds
```

## Related Commands

None

# 6.8.70 show isis topology

## Command Purpose

Use this command to display data about IS-IS topology.

## Command Syntax

show isis topology ( l1 | l2 | level-1 | level-2 | )

show isis *INSTANCE* topology ( l1 | l2 | level-1 | level-2 | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INSTANCE | Display information for specified instance. | Up to 20 characters |
| l1 | Display the path to all level-1 routers in the area. | - |

| | | |
|---|---|---|
| l2 | Display the path to all level-2 routers in the domain. | - |
| level-1 | Display the path to all level-1 routers in the area. | - |
| level-2 | Display the path to all level-2 routers in the domain. | - |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following example shows how to display data about IS-IS topology.:

```
Switch# show isis topology
```

### Related Commands

None

## 6.8.71 show running-config interface isis

### Command Purpose

Use this command to display the ISIS interface configurations.

### Command Syntax

show running-config interface *IFNAME* isis

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| IFNAME | Display the name of interface. | Support physical/aggregation/loop back/vlan/tunnel ports |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following example shows how to display the ISIS interface configurations.:

```
Switch# show running-config interface eth-0-1 isis
Building configuration...
!
interface eth-0-1
 ip router isis
!
```

## Related Commands

None

# 6.8.72 show running-config router isis

## Command Purpose

Use this command to display router ISIS configurations.

## Command Syntax

show running-config router isis

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following example shows how to display router ISIS configurations.:

```
Switch# show running-config router isis
Building configuration...
!
router isis
 net 10.0000.0000.0001.00
!
```

## Related Commands

None

# 7 IPv6 Routing Commands

## 7.1 OSPFv3 Commands

### 7.1.1 area default-cost

#### Command Purpose

To specify a cost for the default summary route sent into a stub, use the area default-cost command in router configuration mode.

To remove the assigned default route cost, use the no form of this command.

#### Command Syntax

area *AREA-ID* default-cost *COST*

no area *AREA-ID* default-cost

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| AREA-ID | Identifier of the area for which authentication is to be enabled. The identifier can be specified as either a decimal value or an IP address | IP address or number in the range of 0-4294967295 |
| COST | Cost for the default summary route used for a stub. | 0-16777215 |

#### Command Mode

Router Configuration

#### Default

The cost value is 1 by default.

### Usage

The command is used only on an Area Border Router (ABR) attached to a stub.

There are two stub area router configuration commands: the stub and default-cost options of the area command. In all routers and access servers attached to the stub area, the area should be configured as a stub area using the stub option of the area command. Use the default-cost option only on an ABR attached to the stub area. The default-cost option provides the metric for the summary default route generated by the ABR into the stub area.

### Examples

The following example assigns a default cost of 20 to stub network 10.0.0.0:

```
Switch# configure terminal
Switch(config)#router ipv6 ospf 201
Switch(config-router)#area 10.0.0.0 stub
Switch(config-router)#area 10.0.0.0 default-cost 20
```

### Related Commands

None

## 7.1.2 area range

### Command Purpose

To consolidate and summarize routes at an area boundary, use the area range command in router configuration mode.To disable this function, use the no form of this command.

### Command Syntax

area *AREA-ID* range *ADDRESS/PREFIX-LENGTH* ( advertise | not-advertise | )

no area *AREA-ID* range *ADDRESS/PREFIX-LENGTH*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| AREA-ID | Identifier of the area for which authentication is to be enabled. The identifier can be specified as either a decimal value or an IP address | IP address or number in the range of 0-4294967295 |
| ADDRESS | IPv6 address | IPv6 Address |
| PREFIX-LENGTH | Prefix length of the address | 1-128 |
| advertise | Advertise this range (default) | - |
| not-advertise | Do Not Advertise this range | - |

## Command Mode

Router Configuration

## Default

This command is disabled by default.

## Usage

The area range command is used only with Area Border Routers (ABRs). It is used to consolidate or summarize routes for an area. The result is that a single summary route is advertised to other areas by the ABR. Routing information is condensed at area boundaries. External to the area, a single route is advertised for each address range. This behavior is called route summarization.

Multiple area router configuration commands specifying the range option can be configured. Thus, OSPF can summarize addresses for many different sets of address ranges.

## Examples

The following example specifies one summary route to be advertised by the ABR to other areas for all subnets on area 10:

```
Switch# configure terminal
Switch(config)# router ipv6 ospf 201
Switch(config-router)#area 10 range 2004::1/16
```

## Related Commands

None

# 7.1.3 area stub

## Command Purpose

To define an area as a stub area, use the area stub command in router configuration mode.

To disable this function, use the no form of this command.

## Command Syntax

area *AREA-ID* stub ( no-summary | )

no area *AREA-ID* stub ( no-summary | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| AREA-ID | Identifier of the area for which authentication is to be enabled. The identifier can be specified as either a decimal value or an IP address | IP address or number in the range of 0-4294967295 |
| no-summary | (Optional) Prevents an Area Border Router (ABR) from sending summary link advertisements into the stub area | - |

## Command Mode

Router Configuration

## Default

No stub area is defined.

## Usage

You must configure the area stub command on all routers and access servers in the stub area. Use the area router configuration command with the default-cost keyword to specify the cost of a default internal router sent into a stub area by an ABR.

There are two stub area router configuration commands: the stub and default-cost options of the area router configuration command. In all routers attached to the stub area, the area should be configured as a stub area using the stub keyword of the area command. Use the default-cost keyword only on an ABR attached to the stub area. The default-cost keyword provides the metric for the summary default route generated by the ABR into the stub area.

To further reduce the number of link-state advertisements (LSAs) sent into a stub area, you can configure the no-summary keyword on the ABR to prevent it from sending summary LSAs (LSA type 3) into the stub area.

## Examples

The following example assigns a default cost of 20 to stub network 10.0.0.0:

```
Switch# configure terminal
Switch(config)# router ipv6 ospf 201
Switch(config-router)#area 10.0.0.0 stub
Switch(config-router)#area 10.0.0.0 default-cost 20
```

## Related Commands

None

# 7.1.4 auto-cost

## Command Purpose

To control how Open Shortest Path First Version3 (OSPFv3) calculates default metrics for the interface; use the auto-cost command in router configuration mode.

To assign cost based only on the interface type, use the no form of this command.

## Command Syntax

auto-cost reference-bandwidth *RATE*

no auto-cost reference-bandwidth

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| RATE | Rate in Mbps (bandwidth). The default is 100 | 1 - 4294967 Mbps |

## Command Mode

Router Configuration

## Default

100 Mbps

## Usage

The value set by the ipv6 ospf cost command overrides the cost resulting from the auto-cost command.

## Examples

The following example changes the cost of the cost link to 1GBps:

```
Switch# configure terminal
Switch(config)# router ipv6 ospf 1
Switch(config-router)#auto-cost reference-bandwidth 1000
```

## Related Commands

ipv6 ospf cost

# 7.1.5 clear ipv6 ospf

## Command Purpose

To clear routing information based on the Open Shortest Path First (OSPF) routing process ID, use the clear ipv6 ospf command in privileged EXEC mode.

## Command Syntax

clear ipv6 ospf ( *PID* | ) process

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PID | (Optional) Process ID | 0-65535 |

## Command Mode

Privileged EXEC

## Default

None

## Usage

Use the PID argument to clear only one OSPFv3 process. If the PID argument is not specified, all OSPFv3 processes are cleared.

## Examples

The following example clears all OSPFv3 processes:

```
Switch# clear ipv6 ospf process
```

## Related Commands

None

# 7.1.6 default-information originate (OSPFv3)

## Command Purpose

To generate a default external route into an Open Shortest Path First Version3 (OSPFv3) routing domain, use the default-information originate command in router configuration mode.

To disable this feature, use the no form of this command.

## Command Syntax

default-information originate

default-information originate { metric *METRIC* | metric-type *TYPE* ) | route-map *ROUTE_MAP* | always }

no default-information originate

no default-information originate { metric | metric-type | route-map | always }

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| always | (Optional) Always advertises the default route regardless of whether the system has a default route | Up to 20 characters |
| METRIC | metric-value (Optional) Metric used for generating the default route. If you omit a value and do not specify a value using the default-metric router configuration command, the default metric value is 10. The value used is specific to the protocol | 0-16777214 |
| TYPE | (Optional) External link type associated with the default route advertised into the OSPF routing domain. It can be one of the following values | 1,2 |
| ROUTE_MAP | Route map reference | - |

## Command Mode

Router Configuration

## Default

This command is disabled by default.

### Usage

Whenever you use the redistribute or the default-information router configuration command to redistribute routes into an OSPFv3 routing domain, the switch automatically becomes an autonomous System Boundary Router (ASBR). However, an ASBR does not, by default, generate a default route into the OSPFv3 routing domain. The system still must have a default route for itself before it generates one, except when you have specified the always keyword.

### Examples

The following example specifies a metric of 100 for the default route redistributed into the OSPFv3 routing domain and an external metric type of Type 1:

```
Switch# configure terminal
Switch(config)# router ipv6 ospf 109
Switch(config-router)# redistribute rip metric 100
Switch(config-router)#default-information originate metric 100 metric-type 1
```

### Related Commands

redistribute (OSPFv3)

## 7.1.7 default-metric (OSPFv3)

### Command Purpose

To set default metric values for the Open Shortest Path First Version3 (OSPFv3) routing protocol, use the default-metric command in router configuration mode.

To return to the default state, use the no form of this command.

### Command Syntax

default-metric *METRIC-VALUE*

no default-metric ( *METRIC-VALUE* )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| METRIC-VALUE | Default metric value appropriate for the specified routing protocol. Default metric value appropriate for the specified routing protocol. Built-in, automatic metric translations, as appropriate for each routing protocol. The metric of redistributed connected and static routes is set to 0 | 0-16777214 |

## Command Mode

Router Configuration

## Default

1 for BGP routes

20 for others

## Usage

The default-metric command is used in conjunction with the redistribute router configuration command to cause the current routing protocol to use the same metric value for all redistributed routes. A default metric helps solve the problem of redistributing routes with incompatible metrics. Whenever metrics do not convert, using a default metric provides a reasonable substitute and enables the redistribution to proceed.

## Examples

The following example shows a router in autonomous system using both the Routing Information Protocol (RIPng) and the OSPFv3 routing protocols. The example advertises OSPFv3-derived routes using RIPng and assigns the Internal Gateway Protocol (IGP)-derived routes a RIPng metric of 10:

```
Switch# configure terminal
Switch(config)# router ipv6 ospf
```

```
Switch(config-router)#default-metric 10
Switch(config-router)# redistribute ripng
```

### Related Commands

redistribute (OSPFv3)

## 7.1.8 distance (OSPFv3)

### Command Purpose

To define Open Shortest Path First Version3 (OSPFv3) route administrative distances based on route type, use the distance command in router configuration mode.

To restore the default value, use the no form of this command.

### Command Syntax

distance { *DISTANCE* | ospfv3 [ external *DIST1* ] [ inter-area *DIST2* ] | [ intra-area *DIST3* ] }

no distance { *DISTANCE* | ospfv3 }

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DISTANCE | Administrative distance. | 1-254.(routes with a distance value of 255 are not installed in the routing table) |
| external DIST1 | (Optional) Sets the distance for routes from other routing domains, learned by redistribution. Range is 1 to 255. The default value is 110 | 1-254 |
| inter-area DIST2 | (Optional) Sets the distance for all routes from one area to another area. Range is 1 to 255. The default value is 110 | 1-254 |
| intra-area DIST3 | (Optional) Sets the distance for all routes within an area. Range is 1 to 255. The default value is 110 | 1-254 |

## Command Mode

Router Configuration

## Default

DIST1: 110

DIST2: 110

DIST3: 110

## Usage

You may specify one of the keywords or use distance only to apply to all types of routes.

The distance command allows you to set a distance for an entire group of routes, rather than a specific route that passes an access list.

A common reason to use the distance command is when you have multiple OSPFv3 processes with mutual redistribution, and you want to prefer internal routes from one over external routes from the other.

## Examples

The following example shows a router in autonomous system using both the Routing Information Protocol (RIPng) and the OSPFv3 routing protocols. The example advertises OSPFv3-derived routes using RIPng and assigns the Internal Gateway Protocol (IGP)-derived routes a RIPng distance of 90:

```
Switch# configure terminal
Switch(config)# router ipv6 ospf
Switch(config-router)#distance 90
Switch(config-router)# redistribute ripng
```

## Related Commands

None

# 7.1.9 distribute-list (OSPFv3)

## Command Purpose

To filter networks received in updates or suppress networks from being advertised in updates, use the distribute-list command in router configuration mode.

To cancel this function, use the no form of this command.

## Command Syntax

distribute-list *ACCESSS-LIST-NAME* ( in | out ( bgp | connected | ospfv3 | ripng | static ) )

no distribute-list *ACCESSS-LIST-NAME* ( in | out ( bgp | connected | ospfv3 | ripng | static ) )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ACCESSS-LIST-NAME | Name of an access list to be applied | Up to 20 characters |
| in | Filter networks received in updates | - |
| out | Suppress networks from being advertised in updates | - |

## Command Mode

Router Configuration

## Default

This command is disabled by default.

## Usage

This command must specify an access list.

## Examples

In the following example, OSPFv3 process 1 is configured to accept two prefixes, prefix 2001:1:1::1/32 and prefix 3001:1:1::1/32:

```
Switch# configure terminal
Switch(config)# ipv6 access-list fiter-as-router
Switch(config-ip-acl)# permit any 2001:1:1::1/32 any
Switch(config-ip-acl)# permit any 3001:1:1::1/32 any
Switch(config-ip-acl)#deny any any any
Switch(config)# router ipv6 ospf 1
Switch(config-router)#distribute-list acl1 in
```

## Related Commands

ipv6 access-list

# 7.1.10 enable db-summary-opt

## Command Purpose

Use this command to enable optimize the process when building ospfv3 neighbor ship.

## Command Syntax

enable db-summary-opt

no enable db-summary-opt

## Command Mode

Router Configuration

## Default

Disable

## Usage

After this function enabled, if the router receives a DD packet which has newer LSA, the router should delete the LSA in the database summary list, and should not send this LSA to its neighbor.

## Examples

The following example enables this optimization:

```
Switch# configure terminal
Switch(config)# router ipv6 ospf 1
Switch(config-if)# enable db-summary-opt

Switch# configure terminal
Switch(config)# router ipv6 ospf 1
Switch(config-router)# enable db-summary-opt
```

## Related Commands

None

# 7.1.11 ipv6 ospf cost

## Command Purpose

To explicitly specify the cost of sending a packet on an interface, use the ipv6 ospf cost command in interface configuration mode. To reset the path cost to the default value, use the no form of this command.

## Command Syntax

ipv6 ospf cost *INTERFACE-COST* ( instance *ID* | )

no ipv6 ospf cost ( instance *ID* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INTERFACE-COST | Unsigned integer value expressed as the link-state metric. | 1-65535 |

### Command Mode

Interface Configuration

### Default

No default cost is predefined.

### Usage

You can set the metric manually using this command, if you need to change the default. Using the bandwidth command changes the link cost as long as this command is not used.

The link-state metric is advertised as the link cost in the router link advertisement.

In general, the path cost is calculated using the following formula:

Reference Bandwidth / bandwidth

### Examples

The following example sets the interface cost value to 65:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport
Switch(config-if)# ipv6 ospf cost 65
```

### Related Commands

auto-cost reference bandwidth

## 7.1.12 ipv6 ospf dead-interval

### Command Purpose

To set the interval during which at least one hello packet must be received from a neighbor before the router declares that neighbor down, use the ipv6 ospf dead-interval command in interface configuration mode. To restore the default value, use the no form of this command.

## Command Syntax

ipv6 ospf dead-interval *SECONDS* ( instance *ID* | )

no ipv6 ospf dead-interval ( instance *ID* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SECONDS | Interval (in seconds) during which the router must receive at least one hello packet from a neighbor or else that neighbor is removed from the peer list and does not participate in routing. The value must be the same for all nodes on the network | 1-65535 |
| ID | Instance ID, the default value is 0. | 0-255 |

## Command Mode

Interface Configuration

## Default

The neighbor is considered as dead in 40s by default.

## Usage

The dead interval is advertised in OSPFv3 hello packets. This value must be the same for all networking devices on a specific network.

Specifying a smaller dead interval (seconds) will give faster detection of a neighbor being down and improve convergence, but might cause more routing instability.

## Examples

The following example sets the OSPFv3 dead interval to 20 seconds:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport
Switch(config-if)# ipv6 ospf dead-interval 20
```

## Related Commands

ipv6 ospf hello-interval

show ipv6s ospf interface

# 7.1.13 ipv6 ospf hello-interval

## Command Purpose

To specify the interval between hello packets that the switch sends on the interface, use the ip ospf hello-interval command in interface configuration mode.

To return to the default time, use the no form of this command.

## Command Syntax

ip ospf hello-interval *SECONDS* ( instance *ID* | )

no ip ospf hello-interval ( instance *ID* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SECONDS | Interval (in seconds) during which the router must receive at least one hello packet from a neighbor or else that neighbor is removed from the peer list and does not participate in routing. The value must be the same for all nodes on the network | 1-65535 |
| ID | Instance ID, the default value is 0. | 0-255 |

## Command Mode

Interface Configuration

## Default

10 seconds (Ethernet)

30 seconds (non-broadcast)

## Usage

This value is advertised in the hello packets. The smaller the hello interval, the faster topological changes will be detected, but more routing traffic will ensue. This value must be the same for all routers and access servers on a specific network.

## Examples

The following example sets the interval between hello packets to 15 seconds:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport
Switch(config-if)# ipv6 ospf hello-interval 15
```

## Related Commands

ipv6 ospf dead-interval

# 7.1.14 ipv6 ospf mtu-ignore

## Command Purpose

To disable Open Shortest Path First Version3 (OSPFv3) maximum transmission unit (MTU) mismatch detection on receiving Database Descriptor (DBD) packets, use the ipv6 ospf mtu-ignore command in interface configuration mode.

To reset to default, use the no form of this command.

## Command Syntax

ipv6 ospf mtu-ignore ( instance *ID* | )

no ipv6 ospf mtu-ignore ( instance *ID* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ID | Instance ID, the default value is 0. | 0-255 |

## Command Mode

Interface Configuration

## Default

OSPFv3 MTU mismatch detection is enabled.

## Usage

OSPFv3 checks whether neighbors are using the same MTU on a common interface. This check is performed when neighbors exchange DBD packets. If the receiving MTU in the DBD packet is higher than the IP MTU configured on the incoming interface, OSPFv3 adjacency will not be established.

## Examples

The following example disables MTU mismatch detection on receiving DBD packets:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport
Switch(config-if)# ipv6 ospf mtu-ignore
```

## Related Commands

None

# 7.1.15 ipv6 ospf priority

## Command Purpose

To set the router priority, which helps determine the designated router for this network, use the ip ospf priority command in interface configuration mode.

To return to the default value, use the no form of this command.

## Command Syntax

ipv6 ospf priority *NUMBER-VALUE* ( instance *ID* | )

no ipv6 ospf priority ( instance *ID* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NUMBER-VALUE | A number value that specifies the priority of the router. | 0-255 |

| | | |
|---|---|---|
| ID | Instance ID, the default value is 0. | 0-255 |

## Command Mode

Interface Configuration

## Default

Priority of 1

## Usage

When two routers attached to a network both attempt to become the designated router, the one with the higher router priority takes precedence. If there is a tie, the router with the higher router ID takes precedence. A router with a router priority set to zero is ineligible to become the designated router or backup designated router. Router priority is configured only for interfaces to multi-access networks (in other words, not to point-to-point networks).

This priority value is used when you configure Open Shortest Path First Version3 (OSPFv3) for non-broadcast networks using the neighbor router configuration command for OSPFv3.

## Examples

The following example sets the router priority value to 4:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport
Switch(config-if)# ipv6 ospf priority 4
```

## Related Commands

None

# 7.1.16 ipv6 ospf retransmit-interval

## Command Purpose

To specify the time between link-state advertisement (LSA) retransmissions for adjacencies belonging to the interface, use the ipv6 ospf retransmit-interval command in interface configuration mode.

To return to the default value, use the no form of this command.

## Command Syntax

ipv6 ospf retransmit-interval *SECONDS* ( instance *ID* | )

no ipv6 ospf retransmit-interval ( instance *ID* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SECONDS | Time (in seconds) between retransmissions. It must be greater than the expected round-trip delay between any two routers on the attached network. | 1-65535 seconds |
| ID | Instance ID, the default value is 0. | 0-255 |

## Command Mode

Interface Configuration

## Default

5 seconds

## Usage

When a router sends an LSA to its neighbor, it keeps the LSA until it receives back the acknowledgment message. If the router receives no acknowledgment, it will resend the LSA. The setting of this parameter should be conservative, or needless retransmission will result. The value should be larger for serial lines and virtual links.

## Examples

The following example sets the retransmit interval value to 8 seconds:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport
Switch(config-if)# ipv6 ospf retransmit-interval 8
```

## Related Commands

None

# 7.1.17 ipv6 ospf transmit-delay

## Command Purpose

To set the estimated time required to send a link-state update packet on the interface, use the ipv6 ospf transmit-delay command in interface configuration mode. To return to the default value, use the no form of this command.

## Command Syntax

ipv6 ospf transmit-delay *SECONDS* ( instance *ID* | )

no ipv6 ospf transmit-delay ( instance *ID* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SECONDS | Time (in seconds) between retransmissions. It must be greater than the expected round-trip delay between any two routers on the attached network. | 1-65535 seconds |
| ID | Instance ID, the default value is 0. | 0-255 |

## Command Mode

Interface Configuration

## Default

1 second

## Usage

Link-state advertisements (LSAs) in the update packet must have their ages incremented by the amount specified in the seconds argument before transmission. The value assigned should take into account the transmission and propagation delays for the interface.

If the delay is not added before transmission over a link, the time in which the LSA propagates over the link is not considered. This setting has more significance on very low-speed links.

## Examples

The following example sets the retransmit delay value to 3 seconds:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport
Switch(config-if)# ipv6 ospf transmit-delay 3
```

## Related Commands

None

# 7.1.18 ipv6 ospf network

## Command Purpose

To set network type of the interface, use the ipv6 ospf network command in interface configuration mode. To return to the default value, use the no format of this command.

## Command Syntax

ipv6 ospf network ( broadcast | non-broadcast | point-to-multipoint ( non-broadcast | ) | point-to-point | ) ( instance <0-255> | )

no ipv6 ospf network ( instance <0-255> | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| broadcast | Specify broadcast multi-access network | - |
| non-broadcast | Specify NBMA network | - |
| point-to-multipoint | Specify point-to-multipoint network | non-broadcast |
| point-to-point | Specify point-to-point network | - |
| instance | Instance ID, the default value is 0. | 0-255 |

## Command Mode

Interface Configuration

## Default

broadcast

## Usage

None

## Examples

The following example sets the netwok type of interface to point-to-point:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport
Switch(config-if)# ipv6 ospf network point-to-point
```

## Related Commands

None

# 7.1.19 ipv6 ospf neighbor

## Command Purpose

To configure IPv6 ospf neighbor, use the ipv6 ospf neighbor command in interface configuration mode. To return to the default value, use the no format of this command.

## Command Syntax

ipv6 ospf neighbor *ADDRESS* ( { poll-interval <1-65535> | priority <0-255> } | ) ( cost <1-65535> | ) ( instance <0-255> | )

no ipv6 ospf neighbor ( instance <0-255> | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ADDRESS | IPv6 addressk of neighbor | IPv6 Address |
| poll-interval | Dead-router polling interval for NBMA neighbor | 1-65535 |
| priority | Priority of non-broadcast neighbor | 0-255 |
| cost | Cost for point-to-multipoint neighbor | 1-65535 |
| instance | Instance ID, the default value is 0. | 0-255 |

## Command Mode

Interface Configuration

## Default

No neighbor is configured.

## Usage

None

## Examples

The following example configure IPv6 ospf neighbor on the interface:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport
Switch(config-if)# ipv6 ospf neighbor fe80::1
```

## Related Commands

None

# 7.1.20 passive-interface (OSPF)

## Command Purpose

To disable sending routing updates for the Open Shortest Path First Version3 (OSPFv3) on an interface, use the passive-interface command in router configuration mode. To re-enable the sending of routing updates, use the no form of this command.

## Command Syntax

passive-interface *IFNAME*

no passive-interface *IFNAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | The interface name | Support physical/aggregation/loopback/vlan/tunnel ports |

## Command Mode

Router Configuration

## Default

Routing updates are sent on the interface.

### Usage

If you disable the sending of routing updates on an interface, the particular subnet will continue to be advertised to other interfaces, and updates from other switches on that interface continue to be received and processed.

### Examples

The following example sets the interface eth-0-1 as passive:

```
Switch# configure terminal
Switch(config)# router ipv6 ospf 200
Switch(config-router)# passive-interface eth-0-1
```

### Related Commands

router ipv6 ospf

## 7.1.21 redistribute (OSPFv3)

### Command Purpose

To redistribute routes from one routing domain into Open Shortest Path First Version3 (OSPFv3) routing domain, use the redistribute command in router configuration mode. To disable redistribution, use the no form of this command.

### Command Syntax

redistribute *PROTOCOL* [ route-map *WORD* ] [ tag *TAG-VALUE* ] [ metric *METRIC-VALUE* ] [ metric-type *TYPE-VALUE* ]

no redistribute *PROTOCOL* [ metric *METRIC-VALUE* ] [ metric-type *TYPE-VALUE* ]

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| route-map WORD | Route map name | Up to 20 characters |
| PROTOCOL | (Optional) The name of a routing protocol, or the keyword connected, or static. If you specify a routing protocol, use one of the following keywords: bgp, and ripng | connected/static/bgp/ripng |

| | | |
|---|---|---|
| tag TAG-VALUE | Set tag for routes redistributed into OSPF | 0-4294967295 |
| metric METRIC-VALUE | (Optional) When redistributing other processes to an OSPF process, the default metric is 20 when no metric value is specified | 0-16777214 |
| metric-type TYPE-VALUE | For OSPF, the external link type associated with the default route advertised into the OSPF routing domain. It can be one of two values | 1-2 |

## Command Mode

Router Configuration

## Default

Route redistribution is disabled.

metric metric-value: 20

metric-type TYPE-VALUE: Type 2 external route

## Usage

The metric value specified in the redistribute command supersedes the metric value specified using the default-metric command.

## Examples

The following example redistribute the static routes into OSPFv3 with metric 10:

```
Switch# configure terminal
Switch(config)# router ospf 119
Switch(config-router)# redistribute static metric 10
```

## Related Commands

default-metric

# 7.1.22 router-id (OSPF)

## Command Purpose

To use a fixed router ID, use the router-id command in router configuration mode.

To force Open Shortest Path First Version3 (OSPFv3) use the previous OSPF router ID behavior, use the no form of this command.

## Command Syntax

router-id *IP-ADDRESS*

no router-id

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IP-ADDRESS | Router ID in IP address format | IPv6 Address |

## Command Mode

Router Configuration

## Default

No OSPF routing process is defined.

## Usage

You can configure an arbitrary value in the IP address format for each router. However, each router ID must be unique.

If this command is used on an OSPFv3 router process which is already active (has neighbors), the new router-ID is used at the next reload or at a manual OSPFv3 process restart. To manually restart the OSPFv3 process, use the clear ip ospf command.

## Examples

The following example specifies a fixed router-id:

```
Switch# configure terminal
Switch(config)# router ipv6 ospf 119
Switch(config-router)# router-id 10.1.1.1
```

## Related Commands

clear ipv6 ospf

router ipv6 ospf

# 7.1.23 router ipv6 ospf

## Command Purpose

To configure an Open Shortest Path First Version3 (OSPFv3) routing process, use the router ipv6 ospf command in global configuration mode. To terminate an OSPFv3s routing process, use the no form of this command.

## Command Syntax

router ipv6 ospf [ *PROCESS-ID* [ vrf *VPN-NAME* ] ]

no router ipv6 ospf [ *PROCESS-ID* ]

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PROCESS-ID | Internally used identification parameter for an OSPF routing process. It is locally assigned and can be any positive integer. A unique value is assigned for each OSPF routing process | 1-65535 |
| vrf VPN-NAME | (Optional) Specifies the name of the VPN routing and forwarding (VRF) instance to associate with OSPFv3 VRF processes | A string with 1-31 characters |

## Command Mode

Global Configuration

### Default

No OSPF routing process is defined.

### Usage

You can specify multiple OSPFv3 routing processes in each router. If you do not specify the process-id, the process-id will be the default 0.

### Examples

The following example configures an OSPFv3 routing process and assigns a process number of 109:

```
Switch# configure terminal
Switch(config)# router ipv6 ospf 109
```

### Related Commands

None

## 7.1.24 capability vrf-lite

### Command Purpose

To disable ospf dn-bit check,calculate all ospf route.

### Command Syntax

capability vrf-lite

no capability vrf-lite

### Command Mode

Router Configuration

### Default

Disable capability vrf-lite

## Usage

It only supports configure under ospfv3 vrf view.

## Examples

The following example enables ospfv3 capability vrf-lite.:

```
Switch# configure terminal
Switch(config)# ip vrf a
Switch(config-vrf)# exit
Switch(config)# router ipv6 ospf 1 vrf a
Switch(config-router)# capability vrf-lite
```

## Related Commands

None

# 7.1.25 dn-bit-check disable

## Command Purpose

To disable ospfv3 dn-bit-check for special type LSA,and calculate it's route.

## Command Syntax

dn-bit-check *LSA-Type*

no dn-bit-check disable

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LSA-type | Specail type of ospfv3 LSA | (summary\|ase\|nssa) |

## Command Mode

Router Configuration

## Default

Default enable LSA DN-bit check.

## Usage

It only supports configure under ospfv3 vrf view.

## Examples

The following example configures don't check DN-bit of ospfv3 summary LSA.:

```
Switch# configure terminal
Switch(config)# ip vrf a
Switch(config-vrf)# exit
Switch(config)# router ipv6 ospf 1 vrf a
Switch(config-router)# dn-bit-check disable summary
```

## Related Commands

None

# 7.1.26 summary-address (OSPFv3)

## Command Purpose

To create aggregate addresses for Open Shortest Path First Version3 (OSPFv3), use the summary-address command in router configuration mode. To restore the default, use the no form of this command.

## Command Syntax

summary-address *PREFIX / PREFIX-LENGTH* [ not-advertise ] [ tag *TAG-VALUE* ]

no summary-address *PREFIX / PREFIX-LENGTH* [ not-advertise ] [ tag *TAG-VALUE* ]

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PREFIX | IP route prefix for the destination | IPv6 Address |
| PREFIX-LENGTH | Prefix length for the network | 1-128 |
| not-advertise | (Optional) Suppress routes that match the specified prefix/mask pair. This keyword applies to OSPFv3 only | - |
| tag TAG-VALUE | Route tag value | 0-4294967295 |

## Command Mode

Router Configuration

## Default

This command is disabled by default.

## Usage

Routes learned from other routing protocols can be summarized. The metric used to advertise the summary is the largest metric of all the more specific routes. This command helps reduce the size of the routing table.

Using this command for OSPFv3 causes an OSPFv3 Autonomous System Boundary Router (ASBR) to advertise one external route as an aggregate for all redistributed routes that are covered by the address. For OSPFv3, this command summarizes only routes from other routing protocols that are being redistributed into OSPFv3. Use the area range command for route summarization between OSPF areas.

OSPFv3 does not support the summary-address 0.0.0.0/0 command.

## Examples

In the following example, the summary address 2001:1:1::/48 includes address 2001:1:1:1::/64, 2001:1:1:2::/64, and so on. Only the address 2001:1:1::/48 is advertised in an external link-state advertisement:

```
Switch# configure terminal
Switch(config)# router ipv6 ospf
Switch(config-router)# summary-address 2001:1:1::/48
```

## Related Commands

area range

# 7.1.27 show ipv6 ospf

## Command Purpose

To display general information about Open Shortest Path First Version3 (OSPFv3) routing processes, use the show ipv6 ospf command in user EXEC or privileged EXEC mode.

## Command Syntax

show ipv6 ospf ( *PROCESS-ID* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PROCESS-ID | Internally used identification parameter for an OSPFv3 routing process. It is locally assigned and can be any positive integer. A unique value is assigned for each OSPFv3 routing process | 1-65535 |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following is sample output from the show ipv6 ospf command when entered without a specific OSPFv3 process ID:

```
Switch# show ipv6 ospf 65535
Routing Process "OSPFv3 (65535)" with ID 1.1.1.1
 Process uptime is 1 hour 52 minutes
 SPF schedule delay min 0.500 secs, SPF schedule delay max 50.0 secs
```

```
Minimum LSA interval 5 secs, Minimum LSA arrival 1 secs
Number of incomming current DD exchange neighbors 0/5
Number of outgoing current DD exchange neighbors 0/5
Number of external LSA 0. Checksum Sum 0x0000
Number of AS-Scoped Unknown LSA 0
Number of LSA originated 3
Number of LSA received 19
Number of areas in this router is 1
   Area BACKBONE(0)
       Number of interfaces in this area is 1(1)
       SPF algorithm executed 6 times
       Number of LSA 4.  Checksum Sum 0x16569
       Number of Unknown LSA 0
```

### Related Commands

None

## 7.1.28 show ipv6 ospf database

### Command Purpose

To display lists of information related to the Open Shortest Path First Version3 (OSPFv3) database for a specific router, use the show ip ospf database command in EXEC mode.

### Command Syntax

show ipv6 ospf ( *PROCESS-ID* | ) database

show ipv6 ospf ( *PROCESS-ID* | ) database adv-router *ROUTER-ID*

show ipv6 ospf ( *PROCESS-ID* | ) database ( external | inter-prefix | inter-router | intra-prefix | link | network | nssa-external | router ) ( *LINK-STATE-ID* | ) ( adv-router *ROUTER-ID* | self-originate )

show ipv6 ospf ( *PROCESS-ID* | ) database max-age

show ipv6 ospf ( *PROCESS-ID* | ) database self-originate

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PROCESS-ID | Internally used identification parameter for an OSPFv3 routing process. It is locally assigned and can be any positive integer. A unique value is assigned for each OSPFv3 routing process | 1-65535 |
| adv-router ROUTER-ID | (Optional) Displays all the LSAs of the specified router. If no IP address is included, the information is about the local router itself (in this case, the same as self-originate) | IPv4 Address in A.B.C.D format |
| LINK-STATE-ID | (Optional) Portion of the Internet environment that is being described by the advertisement. The value entered depends on the advertisement's LS type. It must be entered in the form of an IP address | IPv4 Address in A.B.C.D format |

## Command Mode

Privileged EXEC

## Default

None

## Usage

The various forms of this command deliver information about different OSPFv3 link state advertisements.

## Examples

The following is sample output from the show ipv6 ospf database command when no arguments or keywords are used:

```
Switch# show ipv6 ospf 65535 database
            OSPFv3 Router with ID (1.1.1.1) (Process 65535)
                Link-LSA (Interface vlan1000)
Link State ID   ADV Router      Age  Seq#       CkSum  Prefix
```

```
0.0.19.232      1.1.1.1         1492 0x80000002 0x27e3      1
0.0.19.232      2.2.2.2         1488 0x80000002 0xcc94      1
                Router-LSA (Area 0.0.0.0)
Link State ID   ADV Router      Age  Seq#       CkSum    Link
0.0.0.0         1.1.1.1         1452 0x80000003 0x42d6      1
0.0.0.0         2.2.2.2         1449 0x80000003 0x24f0      1
                Network-LSA (Area 0.0.0.0)
Link State ID   ADV Router      Age  Seq#       CkSum
0.0.19.232      2.2.2.2         1453 0x80000001 0x7f99
                Intra-Area-Prefix-LSA (Area 0.0.0.0)
Link State ID   ADV Router      Age  Seq#       CkSum  Prefix  Reference
0.0.0.2         2.2.2.2         1448 0x80000001 0x96fd      2  Network-LSA
```

## Related Commands

None

# 7.1.29 show ipv6 ospf interface

## Command Purpose

To display Open Shortest Path First Version3 (OSPFv3)-related interface information; use the show ipv6 ospf interface command in EXEC mode.

## Command Syntax

show ipv6 ospf interface ( *IFNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | (Optional) Interface name. If the interface-name argument is included, only information for the specified interface is included | Support physical/aggregation/loop back/vlan/tunnel ports |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following is sample output of the show ipv6 ospf interface command when vlan12 is specified:

```
Switch# show ipv6 ospf interface vlan 12
vlan12 is up, line protocol is up
  Interface ID 4108
  IPv6 Prefixes
    fe80::8eb5:d5ff:fed9:ff00/10 (Link-Local Address)
    2004:12:0:12::1/96
  OSPFv3 Process (0), Area 0.0.0.0, Instance ID 0
    Router ID 1.1.1.1, Network Type BROADCAST, Cost: 1
    Transmit Delay is 1 sec, State Backup, Priority 1
    Designated Router (ID) 2.2.2.2
      Interface Address fe80::188f:beff:fe99:9800
    Backup Designated Router (ID) 1.1.1.1
      Interface Address fe80::8eb5:d5ff:fed9:ff00
    Timer interval configured, Hello 10, Dead 40, Wait 40, Retransmit 5
      Hello due in 00:00:06
    Neighbor Count is 1, Adjacent neighbor count is 1
```

## Related Commands

None

# 7.1.30 show ipv6 ospf neighbor

## Command Purpose

To display Open Shortest Path First Version3 (OSPFv3)-neighbor information on a per-interface basis, use the show ipv6 ospf neighbor command in privileged EXEC mode.

## Command Syntax

show ipv6 ospf neighbor ( *IFNAME* | ) ( *NEIGHBOR-ID* | ) ( detail | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | (Optional) Interface name. If the interface-name argument is included, only information for the specified interface is included | Support physical/aggregation/loopback/vlan/tunnel ports |
| NEIGHBOR-ID | (Optional) Neighbor ID | IPv4 Address in A.B.C.D format |
| detail | (Optional) Displays all neighbors given in detail (lists all neighbors) | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following is sample output from the show ipv6 ospf neighbor command showing a single line of summary information for each neighbor:

```
Switch# show ipv6 ospf neighbor
OSPFv3 Process (0)
Neighbor ID     Pri   State           Dead Time   Interface  Instance ID
2.2.2.2           1   Full/DR         00:00:31    vlan12     0
2.2.2.2           1   Full/DR         00:00:33    vlan1212   0
OSPFv3 Process (65535)
Neighbor ID     Pri   State           Dead Time   Interface  Instance ID
2.2.2.2           1   Full/DR         00:00:31    vlan1000   0
```

## Related Commands

None

# 7.1.31 show ipv6 ospf database database-summary

## Command Purpose

To display the summary of database used by OSPFv3, use the show ip ospf database database-summary command in privileged EXEC mode.

## Command Syntax

show ipv6 ospf ( *PROCESS-ID* | ) database database-summary

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PROCESS-ID | (Optional) Internal identification. It is locally assigned and can be any positive integer. The number used here is the number assigned administratively when enabling the OSPF routing process | 1-65535 |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following example shows how to use show ipv6 ospf database database-summary command:

```
Switch# show ipv6 ospf 65535 database database-summary
            OSPFv3 Router with ID (1.1.1.1) (Process ID 65535)
Area (0.0.0.0) database summary
  LSA Type              Count         MaxAge
```

```
  Router                  2             0
  Network                 1             0
  Inter-Prefix            0             0
  Inter-Router            0             0
  Intra-Prefix            1             0
  Subtotal                4             0
Process 65535 database summary
  LSA Type              Count         MaxAge
  Router                  2             0
  Network                 1             0
  Inter-Prefix            0             0
  Inter-Router            0             0
  Type-5 Ext              0             0
  Link                    2             0
  Intra-Prefix            1             0
  Total                   6             0
```

## Related Commands

None

# 7.1.32 show ipv6 ospf route

## Command Purpose

To display the summary of routes used by OSPFv3, use the show ipv6 ospf route summary command in privileged EXEC mode.

## Command Syntax

show ipv6 ospf ( *PROCESS-ID* | ) route

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PROCESS-ID | (Optional) Internal identification. It is locally assigned and can be any positive integer. The number used here is the number assigned administratively when enabling the OSPFv3 routing process | 1-65535 |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following example shows how to use show ipv6 ospf route command:

```
Switch# show ipv6 ospf route
OSPFv3 Process (0)
Codes: C - connected, D - Discard, O - OSPF, IA - OSPF inter area
       E1 - OSPF external type 1, E2 - OSPF external type 2
   Destination                                  Metric
     Next-hop
C  2004:1:0:10::/96                                1
     directly connected, vlan10, Area 0.0.0.0
C  2004:1:0:20::/96                                1
     directly connected, vlan20, Area 0.0.0.14
C  2004:1:0:100::/96                               1
     directly connected, vlan100, Area 0.0.0.0
C  2004:1:0:200::/96                               1
     directly connected, vlan200, Area 0.0.0.14
O  2004:2:0:10::/96                                2
     via fe80::188f:beff:fe99:9800, vlan1212, Area 0.0.0.0
     via fe80::188f:beff:fe99:9800, vlan12, Area 0.0.0.0
IA 2004:2:0:20::/96                                2
     via fe80::188f:beff:fe99:9800, vlan1212, Area 0.0.0.0
     via fe80::188f:beff:fe99:9800, vlan12, Area 0.0.0.0
```

## Related Commands

None

# 7.1.33 show ipv6 ospf route summary

## Command Purpose

To display the summary of routes used by OSPFv3, use the show ipv6 ospf route summary command in privileged EXEC mode.

## Command Syntax

show ipv6 ospf ( *PROCESS-ID* | ) route summary

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PROCESS-ID | (Optional) Internal identification. It is locally assigned and can be any positive integer. The number used here is the number assigned administratively when enabling the OSPFv3 routing process | 1-65535 |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following example shows how to use show ipv6 ospf route summary command:

```
Switch# show ipv6 ospf route summary
           OSPFv3 Router with ID (1.1.1.1) (Process ID 0)
  Route Type                      Count
  (C)Connected                      8
  (D)Discard                        0
  (O)Intra area                     2
  (IA)Inter area                    4
  (E1)Ext type 1                    0
  (E2)Ext type 2                    0
  (N1)NSSA Ext type 1               0
  (N2)NSSA Ext type 2               0
  Total                             14
           OSPFv3 Router with ID (1.1.1.1) (Process ID 65535)
  Route Type                      Count
  (C)Connected                      1
  (D)Discard                        0
  (O)Intra area                     1
```

```
(IA)Inter area                    0
(E1)Ext type 1                    0
(E2)Ext type 2                    0
(N1)NSSA Ext type 1               0
(N2)NSSA Ext type 2               0
Total                             2
```

### Related Commands

None

## 7.1.34 show ipv6 protocols ospf

### Command Purpose

To display IPv6 routing protocol process parameters and statistics of Open Shortest Path First Version3 (OSPFv3).use the show ipv6 ospf protocols ospf command in privileged EXEC mode.

### Command Syntax

show ipv6 protocols ospf

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following example shows how to use show ipv6 protocols ospf command:

```
Switch# show ipv6 protocols ospf
Routing Protocol is "OSPFv3 (0)" with ID 1.1.1.1
  Redistributing:
  Distance: (default is 110)
```

```
Routing Protocol is "OSPFv3 (65535)" with ID 1.1.1.1
 Redistributing:
 Distance: (default is 110)
```

### Related Commands

None

## 7.1.35 timers spf

### Command Purpose

To turn on Open Shortest Path First Version3 (OSPFv3) shortest path first (SPF) throttling, use the timers spf command in router configuration mode. To turn off SPF throttling, use the no form of this command.

### Command Syntax

timers spf exp *SPF-HOLD_MIN SPF-HOLD_MAX*

no timers spf exp

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SPF-HOLD_MIN | Indicates the maximum hold time between two consecutive SPF calculations. | 0-2147483647 milliseconds |
| SPF-HOLD_MAX | Indicates the minimum hold time between two consecutive SPF calculations. | 0-2147483647 milliseconds |

### Command Mode

Router Configuration

### Default

None

### Usage

None

## Examples

The following example shows how to configure SPF calculation parameters:

```
Switch# configure terminal
Switch(config)# router ipv6 ospf 1
Switch(config-router)# router-id 10.10.10.2
Switch(config-router)# timers spf exp 20 50
```

## Related Commands

None

# 7.1.36 max-concurrent-dd

## Command Purpose

To specify Maximum number allowed to process DD concurrently, use the max-concurrent-dd command in router configuration mode. To restore default value, use the no form of this command

## Command Syntax

max-concurrent-dd *NUMBER-VALUE*

no max-concurrent-dd

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NUMBER-VALUE | Number of DD process | 1-65535 |

## Command Mode

Router Configuration

## Default

None

## Usage

This command used to specify Maximum number allowed to process DD concurrently.

## Examples

The following example shows how to use max-concurrent-dd command.:

```
Switch# configure terminal
Switch(config)# router ipv6 ospf 100
Switch(config-router)# router-id 10.10.10.2
Switch(config-router)# max-concurrent-dd 10
```

## Related Commands

None

# 7.1.37 debug ipv6 ospf

## Command Purpose

Use this command to specify all debugging options for OSPFv3. Use the no parameter with this command to disable this function.

## Command Syntax

debug ipv6 ospf ( all | )

no debug ipv6 ospf ( all | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| all | enable all debugging | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

The debug ospf all command enables the display of all debug information.

## Examples

```
Switch# debug ipv6 ospf all
Switch# debug ipv6 ospf
```

## Related Commands

None

# 7.1.38 debug ipv6 ospf events

## Command Purpose

Use this command to specify debugging options for OSPFv3 event troubleshooting. Use this command without parameters to turn on all the options. Use the no parameter with this command to disable this function.

## Command Syntax

debug ipv6 ospf events ( abr | asbr | nssa | os | router | vlink )

no debug ipv6 ospf events ( abr | asbr | nssa | os | router | vlink )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| abr | shows ABR events | - |
| asbr | shows ASBR events | - |
| nssa | shows NSSA events | - |
| os | shows OS interaction events | - |
| router | shows others router events | - |
| vlink | shows virtual link events | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

The debug ospf event command enables the display of debug information related to OSPFv3 internal events.

## Examples

```
Switch# debug ipv6 ospf events nssa
Switch# debug ipv6 ospf events lsa
```

## Related Commands

None

# 7.1.39 debug ipv6 ospf ifsm

## Command Purpose

Use this command to specify debugging options for OSPFv3 Interface Finite State Machine (IFSM) troubleshooting.

Use the no parameter with this command to disable this function.

## Command Syntax

debug ipv6 ospf ifsm ( status | events | timers )

no debug ipv6 ospf ifsm ( status | events | timers )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| status | Displays IFSM status information | - |
| events | Displays IFSM event information | - |
| timers | Displays IFSM TIMER information | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

The debug ospf ifsm command enables the display of debug information related to the Interface Finite State Machine (IFSM).

## Examples

```
Switch# debug ipv6 ospf ifsm timers
```

## Related Commands

None

# 7.1.40 debug ipv6 ospf nfsm

## Command Purpose

Use this command to specify debugging options for OSPFv3 Neighbor Finite State Machine (NFSM) troubleshooting.

Use the no parameter with this command to disable this function.

## Command Syntax

debug ipv6 ospf nfsm ( status | events | timers )

no debug ipv6 ospf nfsm ( status | events | timers )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| status | Displays NFSM status information | - |
| events | Displays NFSM event information | - |
| timers | Displays NFSM TIMER information | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

The debug ospf nfsm command enables the display of debug information related to the Neighbor Finite State Machine (NFSM).

## Examples

```
Switch# debug ipv6 ospf nfsm timers
```

## Related Commands

None

# 7.1.41 debug ipv6 ospf lsa

## Command Purpose

Use this command to specify debugging options for OSPFv3 Link State Advertisements (LSA) troubleshooting.

Use the no parameter with this command to disable this function.

## Command Syntax

debug ipv6 ospf lsa ( flooding | generate | install | maxage | refresh )

no debug ipv6 ospf lsa ( flooding | generate | install | maxage | refresh )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| flooding | Displays LSA flooding | - |
| generate | Displays LSA generate | - |
| install | Displays LSA installation | - |

| | | |
|---|---|---|
| maxage | Displays the maximum age of LSA in seconds | - |
| refresh | Displays LSA refresh | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

The debug ospf lsa command enables the display of debug information related to internal operations of LSAs.

## Examples

```
Switch# debug ipv6 ospf lsa install
```

## Related Commands

None

# 7.1.42 debug ipv6 ospf packet

## Command Purpose

Use this command to specify debugging options for OSPFv3 packets.

Use the no parameter with this command to disable this function..

## Command Syntax

debug ipv6 ospf packet *PARAMETERS*

no debug ipv6 ospf packet *PARAMETERS*

*PARAMETERS* = dd | detail | hello | ls-ack | ls-request | ls-update | recv | send

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| dd | Specifies debugging for OSPF database descriptions | - |
| detail | Sets the debug option to detailed information | - |
| hello | Specifies debugging for OSPF hello packets | - |
| ls-ack | Specifies debugging for OSPF link state acknowledgments | - |
| ls-request | Specifies debugging for OSPF link state requests | - |
| ls-update | Specifies debugging for OSPF link state updates | - |
| recv | Specifies the debug option set for received packets | - |
| send | Specifies the debug option set for sent packets | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

The debug ospf packet command enables the display of debug information related to the sending and receiving of packets.

## Examples

```
Switch# debug ipv6 ospf packet dd send detail
```

## Related Commands

None

# 7.1.43 debug ipv6 ospf route

## Command Purpose

Use this command to specify which route calculation to debug. Use this command without parameters to turn on all the options.

Use the no parameter with this command to disable this function.

## Command Syntax

debug ipv6 ospf route ( ase | ia | install | spf )

no debug ipv6 ospf route ( ase | ia | install | spf )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ase | Specifies the debugging of external route calculation | - |
| ia | Specifies the debugging of Inter-Area route calculation | - |
| install | Specifies the debugging of route installation | - |
| spf | Specifies the debugging of SPF calculation | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

The debug ospf route command enables the display of debug information related to route-calculation

## Examples

```
Switch# debug ipv6 ospf route install
```

### Related Commands

None

## 7.1.44 show debugging ipv6 ospf

### Command Purpose

Use this command to display the set OSPFv3 debugging option..

### Command Syntax

show debugging ipv6 ospf

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This is a sample output from the show debugging ipv6 ospf command. Some lines in this output wrap around, they might not wrap around in the actual display:

```
Switch# show debugging ipv6 ospf
OSPFv3 debugging status:
  OSPFv3 all packet detail debugging is on
  OSPFv3 all IFSM debugging is on
  OSPFv3 all NFSM debugging is on
  OSPFv3 all LSA debugging is on
  OSPFv3 all route calculation debugging is on
  OSPFv3 all event debugging is on
```

### Related Commands

None

## 7.1.45 show resource ipv6 ospf

### Command Purpose

Use this command to display the route resources used by OSPFv3 protocol.

### Command Syntax

show resource ipov6 ospf

### Command Mode

Privileged EXEC

### Default

None

### Usage

None.

### Examples

The following is sample output from the show resource ipv6 ospf command:

```
Switch# show resource ipv6 ospf
OSPFv3
Resource                          Used          Capability
================================================================
Routes                            16            1913
```

### Related Commands

show ipv6 ospf route summary

## 7.1.46 show ipv6 vrf ospf

### Command Purpose

Use this command to display the ospfv3 interface belong to which vrf

### Command Syntax

show ipv6 vrf ospf

### Command Mode

Privileged EXEC

### Default

None

### Usage

None.

### Examples

The following is sample output from the show ipv6 vrf ospf command:

```
Switch# show ipv6 vrf ospf
Name             Interfaces
ccc              eth-0-9
```

### Related Commands

None

## 7.1.47 area nssa

### Command Purpose

Use this command to set the specified area as NSSA area, and use the keyword 'no' to cancel the setting of this area as stub area.

## Command Syntax

area *AREA-ID* nssa ( translator-role ( candidate | never | always ) | ) ( no-summary | ) ( no-redistribution | ) ( default-information-originate { metric *METRIC_VALUE* | metric-type *TYPE-VALUE* | } | )

no area *AREA-ID* nssa ( translator-role | ) ( no-summary | ) ( no-redistribution | ) ( stability-interval | ) ( default-information-originate | )

| 参数 | 参数说明 | 参数取值 |
| --- | --- | --- |
| AREA-ID | 区域标识符，标识符可以是十进制的或者是 IP 地址 | IP 地址或 0-4294967295 的整数 |
| candidate | (可选)配置 ABR 在 NSSA 区域中的角色为候选转换路由器 | - |
| always | (可选)配置 ABR 在 NSSA 区域中的角色为指定转换路由器 | - |
| no-summary | (可选)如果指定了此项，则禁止 ABR 向此区域发送 Summary LSAs | - |
| no-redistribution | (可选)如果指定了此项，则禁止向此区域引入外部路由 | - |
| default-information-originate | (可选)如果指定了此项，则 ASBR 将产生默认的 type 7 LSA 到 NSSA 区域 | - |
| metric METRIC_VALUE | (可选)配置生成的默认路由的 metric 值 | 0-16777214 |
| metric-type TYPE-VALUE | (可选)配置生成的默认路由的 metric 类型 | 1-2 |
| stability-interval INTERVAL-VALUE | (可选)配置失效时间 | 0-2147483647 seconds |

## Command Mode

路由模式

## Default

默认无 NSSA 区域

### Usage

缺省情况下，没有区域被设置为 NSSA 区域。NSSA 区域的所有路由器都必须用 area nssa 进行设置。 NSSA 区域与 STUB 区域有许多相似的地方，两者都不传播来自其它 OSPF 区域的外部路由。差别在于 NSSA 区域能够将外部路由引入并传播到整个 OSPF 自治域中，而 STUB 区域不能引入外部路由。

### Examples

下面例子讲述了如何配置 NSSA 区域

```
Switch# configure terminal
Switch(config)# router ipv6 ospf 201
Switch(config-router)# area 10.0.0.0 nssa
```

### Related Commands

none

## 7.2 RIPng Commands

### 7.2.1 router ipv6 rip

### Command Purpose

To enable or configure the Routing Information Protocol next generation (RIPng) routing process, use the router ipv6 rip command in global configuration mode.

To disable the RIPng routing process, use the no form of this command.

### Command Syntax

router ipv6 rip

no router ipv6 rip

### Command Mode

Global Configuration

### Default

No RIPng routing process is defined.

### Usage

None

### Examples

The following example shows how to enable RIPng routing process:

```
Switch# configure terminal
Switch(config)# router ipv6 rip
```

### Related Commands

None

## 7.2.2 ipv6 router rip

### Command Purpose

To enable RIPng routing process on specifical interface, use the command ipv6 router rip in interface configuration mode.

Use the no parameter with this command to disable RIPng routing process on interface.

### Command Syntax

ipv6 router rip

no ipv6 router rip

### Command Mode

Interface Configuration

### Default

None.

## Usage

None

## Examples

The following example shows how to enable RIPng on the interface eth-0-1:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport
Switch(config-if)# ipv6 router rip
```

## Related Commands

None

# 7.2.3 ipv6 rip metric-offset

## Command Purpose

Use this command to set RIP metric offset in interface mode.

To restore the default metric, use the no form of this command.

## Command Syntax

ipv6 rip metric-offset *NUMBER-VALUE*

no ipv6 rip metric-offset *NUMBER-VALUE*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NUMBER-VALUE | Metric offset value | 1-16 |

## Command Mode

Interface Configuration

## Default

Metric offset value is 1.

### Usage

Metric offset value is used to add the metric of the network on which the message arrived (as the RFC describes).

### Examples

The following example shows how to set metric offset as 2:

```
Switch# configure terminal
Switch(config)#interface eth-0-1
Switch(config-if)# ipv6 rip metric-offset 2
```

### Related Commands

None

## 7.2.4 ipv6 rip split-horizon

### Command Purpose

To enable the split horizon mechanism for Routing Information Protocol next generation (RIPng), use the ipv6 rip split-horizon command in interface configuration mode.

To disable the split horizon mechanism, use the no form of this command.

### Command Syntax

ipv6 rip split-horizon ( poisoned | )

no ipv6 rip split-horizon

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| poisoned | Split horizon with poisoned reverse | - |

### Command Mode

Interface Configuration

### Default

This command is enabled with poisoned reverse by default.

### Usage

In general, changing the default state for the ipv6 rip split-horizon command is not recommended, unless you are certain that your application requires a change in order to properly advertise routes.

### Examples

The following example enables split horizon without poisoned reverse:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ipv6 rip split- horizon
```

### Related Commands

None

## 7.2.5 default-information originate (RIPng)

### Command Purpose

To generate a default route into Routing Information Protocol next generation (RIPng), use the default-information originate command in router configuration mode.

To disable this feature, use the no form of this command.

### Command Syntax

default-information originate ( route-map *NAME* | )

no default-information originate ( route-map | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | Route map name to reference | Up to 20 characters |

### Command Mode

Router Configuration

### Default

This command is disabled by default.

### Usage

The default route can be learned by neighbor, but can't be stored in FIB.

### Examples

The following example originates a default route (0::0/0) into RIPng:

```
Switch# configure terminal
Switch(config)# router ipv6 rip
Switch(config-router)# default-information originate
```

### Related Commands

None

## 7.2.6 default-metric (RIPng)

### Command Purpose

To specify the metrics to be assigned to redistributed routers for Routing Information Protocol next generation (RIPng), use the default-metric command in router configuration mode.

To return to the default state, use the no form of this command.

### Command Syntax

default-metric *NUMBER-VALUE*

no default-metric

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NUMBER-VALUE | Metric value | 1-16 |

### Command Mode

Router Configuration

### Default

By default, the metric is set to 0.

### Usage

The default-metric command is used in conjunction with the redistribute router configuration command to cause the current routing protocol to use the same metric value for all redistributed routes. A default metric helps solve the problem of redistributing routes with incompatible metrics. Whenever metrics do not convert, using a default metric provides a reasonable substitute and enables the redistribution to proceed.

### Examples

The following example shows a switch using both the RIPng and the Open Shortest Path First (OSPFv3) routing protocols. The example advertises OSPFv3-derived routes using RIPng and assigns the OSPFv3-derived routes a RIPng metric of 10:

```
Switch# configure terminal
Switch(config)# router ipv6 rip
Switch(config-router)#default-metric 10
Switch(config-router)#redistribute ospfv3
```

### Related Commands

redistribute (RIPng)

## 7.2.7 distance (RIPng)

### Command Purpose

To define an administrative distance for routes that are inserted into the routing table, use the distance command in router configuration mode.

To return the administrative distance to its default distance definition, use the no form of this command.

An administrative distance is a rating of the trustworthiness of a routing information source, such as an individual switch or a group of switches. Numerically, an administrative distance is an integer from 0 to 255. In general, the higher the value is, the lower the trust rating. An administrative distance of 255 means the routing information source cannot be trusted at all and should be ignored.

## Command Syntax

distance *DISTANCE*

no distance

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DISTANCE | Administrative distance | 1-255.(routes with a distance value of 255 are not installed in the routing table) |

## Command Mode

Router Configuration

## Default

By default, the distance is 120.

## Usage

| Route Source | Default Distance |
|---|---|
| Connected interface | 0 |
| Static route | 1 |
| External Border Gateway Protocol (eBGP) | 20 |
| Open Shortest Path First (OSPF) | 110 |
| Routing Information Protocol (RIP)/ Routing Information Protocol next generation (RIPng) | 120 |
| Internal BGP | 200 |
| Unknown | 255 |

### Examples

The following example set the distance of RIPng 投 200:

```
Switch# configure terminal
Switch(config)#router ipv6 rip
Switch(config-router)#distance 200
```

### Related Commands

None

## 7.2.8 neighbor (RIPng)

### Command Purpose

To specify a neighboring router to which to notify routing updating information, use the neighbor command in router configuration mode.

To remove the neighbor, use the no form of this command.

### Command Syntax

neighbor *IPV6_ADDR IFNAME*

no neighbor *IP-ADDRESS IFNAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IPV6_ADDR | Link-local IP address of a peer switch with which routing information will be notified | IPv6 Address |
| IFNAME | Interface name to which the neighbor is specified | Support physical/aggregation/loopback/vlan/tunnel ports |

### Command Mode

Router Configuration

### Default

No neighboring switches are defined.

### Usage

Especially use the neighbor command in conjunction with the passive-interface command to send routing updates to specific neighbors. This command permits the point-to-point (non-multicast) notification of routing update information. Multiple neighbors can be configured

### Examples

In the following example, RIPng updates are sent to all interfaces which have been enabled RIPng routing except eth-0-1. However, in this case a neighbor switch configuration command is included. This command permits the sending of routing updates to specific neighbors:

```
Switch# configure terminal
Switch(config)#router ipv6 rip
Switch(config-router)# passive-interface eth-0-1
Switch(config-router)# neighbor fe80:db8::1 eth-0-1
```

### Related Commands

router rip

## 7.2.9 offset-list (RIPng)

### Command Purpose

To add an offset to incoming and outgoing metrics to routes exchanging via Routing Information Protocol next generation (RIPng), use the offset-list command in router configuration mode.

To remove an offset list, use the no form of this command.

### Command Syntax

offset-list *ACCESSS-LIST-NAME* ( in | out ) *METRIC-OFFSET* ( *IFNAME* | )

no offset-list ( in | out ) ( *IFNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ACCESSS-LIST-NAME | Named access list to be applied | Up to 40 characters |

| | | |
|---|---|---|
| in | Applies the access list to incoming metrics | - |
| out | Applies the access list to outgoing metrics | - |
| METRIC- OFFSET | Positive offset to be applied to metrics for networks matching the access list. The meric-offset range is 0 to 16 | 0-16 |
| IFNAME | Interface name to which the offset list is applied | Support physical/aggregation/loopback/vlan/tunnel ports |

## Command Mode

Router Configuration

## Default

This command is configured by default.

## Usage

Especially if the offset value is added to the routing metric by offset-list, the default action where the metric updates when RIPng message arrives (as RFC defined) is ignored, but outputs will be added.

The offset value is added to the routing metric. An offset list with an interface is considered extended and takes precedence over an offset list that is not extended. Therefore, if an entry passes the extended offset list and the normal offset list, the offset of the extended offset list is added to the metric.

## Examples

In the following example, the switch applies an offset of 10 if access list 21 permits:

```
Switch# configure terminal
Switch(config)# router ipv6 rip
Switch(config-router)# offset-list 21 out 10
```

## Related Commands

None

## 7.2.10 passive-interface (RIPng)

### Command Purpose

To disable sending routing updates for the Routing Information Protocol next generation (RIPng) on an interface, use the passive-interface command in router configuration mode.

To enable the sending of routing updates, use the no form of this command.

### Command Syntax

passive-interface *IFNAME*

no passive-interface *IFNAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | The interface name | Support physical/aggregation/loopback/vlan/tunnel ports |

### Command Mode

Router Configuration

### Default

Interface is active by default.

### Usage

The command disable the sending of routing updates and ignore the request message from neighbor on an interface, but updates from other routers on that interface should be received and processed.

### Examples

The following example sets the interface eth-0-1 as passive:

```
Switch# configure terminal
Switch(config)#router ipv6 rip
```

```
Switch(config-router)# passive-interface eth-0-1
访问控制列表
```

### Related Commands

router ipv6 rip

## 7.2.11 redistribute (RIPng)

### Command Purpose

To redistribute routes from one routing domain into RIPng routing domain, use the redistribute command in router configuration mode.

To disable redistribution, use the no form of this command.

### Command Syntax

redistribute *PROTOCOL* { [ metric *VALUE* ] | route-map *NAME* }

no redistribute *PROTOCOL*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PROTOCOL | The name of a routing protocol, or the keyword connected, or static. If you specify a routing protocol, use one of the following keywords: bgp, and ospfv3, static, connected,isis | connected/static/bgp/ospf/isis |
| metric VALUE | (Optional) When redistributing other routing process to the RIP process, the default metric is 1 if no metric value is specified | 1-16 |
| route-map NAME | Route map reference, name of route-map entry | Up to 20 characters |

### Command Mode

Router Configuration

### Default

Route redistribution is disabled.

Metric-value: 0

### Usage

The metric value specified in the redistribute command supersedes the metric value specified using the default-metric command.

### Examples

The following example redistributes the static routes into RIPng with metric 10:

```
Switch# configure terminal
Switch(config)#router ipv6 rip
Switch(config-router)#redistribute static metric 10
```

### Related Commands

default-metric

## 7.2.12 timers basic (RIPng)

### Command Purpose

To adjust Routing Information Protocol next generation (RIPng) network timers, use the timers basic command in router configuration mode.

To restore the default timers, use the no form of this command.

### Command Syntax

timers basic *UPDATE TIMEOUT INVALID*

no timers basic

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| UPDATE | Rate (in seconds) at which updates are sent. This is the fundamental timing parameter of the routing protocol | 5-2147483647 seconds |
| TIMEOUT | Time (in seconds) after which a route is declared invalid without updates that refresh the route. The route then enters into an invalid state and is not used for forwarding packets. It is marked inaccessible and advertised as unreachable | 5-2147483647 seconds |
| INVALID | Time after which an invalid route is removed from RIPng routing database | 5-2147483647 seconds |

## Command Mode

Router Configuration

## Default

Update timer: 30 seconds

Timeout timer: 180 seconds

Invalid timer: 120 seconds

## Usage

The basic timing parameters for RIPng are adjustable. Because RIPng is executing a distributed, asynchronous routing algorithm, these timers must be the same for all switches and access servers in the network.

## Examples

The following example sets updates to every 5 seconds. If a switch is not learned from in 15 seconds, the route is declared unusable. And after 15 seconds the invalid route will be removed from RIPng routing database:

```
Switch# configure terminal
Switch(config)#router ipv6 rip
Switch(config-router)#timers basic 5 15 15
```

### Related Commands

None

## 7.2.13 distribute-list(RIPng)

### Command Purpose

To filter networks in routing updates, use the distribute-list command in router configuration mode.

To restore the default value, use the no form of this command.

### Command Syntax

distribute-list ( prefix *NAME* | *ACCESSS-LIST-NAME* ) ( in | out ) ( *IFNAME* | )

no distribute-list ( prefix name | *ACCESSS-LIST-NAME* ) ( in | out ) ( *IFNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| prefix NAME | Filter prefixes in routing update | Up to 40 characters |
| ACCESSS-LIST-NAME | Access-list name | Up to 40 characters |
| in | Filter incoming routing updates | - |
| out | Filter outgoing routing updates | - |
| IFNAME | The interface name | Support physical/aggregation/loopback/vlan/tunnel ports |

### Command Mode

Router Configuration

### Default

None

## Usage

None

## Examples

The following example filters the received RIPng routes:

```
Switch# configure terminal
Switch(config)#router ipv6 rip
Switch(config-router)# distribute-list prefix 1 in
```

## Related Commands

ipv6 prefix-list

# 7.2.14 aggregate-address (RIPng)

## Command Purpose

To specify an aggregate RIPng route announcement, use the aggregate-address command in router configuration mode.

To disable this feature, use the no form of this command.

## Command Syntax

aggregate-address *IPV6_PREFIX* ( avoid-feedback | ) *IFNAME*

no aggregate-address *IP-ADDRESS IFNAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IPV6_PREFIX | Specify an aggregate network (IPv6 address prefix and length). | IPv6 Address and mask length in X:X::X:X/M format |
| avoid-feedback | Forbid to learn the address which is the same to aggregate address from the interface | - |
| IFNAME | The interface name | Support physical/aggregation/loopback/vlan/tunnel ports |

### Command Mode

Router Configuration

### Default

No aggregate address is defined.

### Usage

If the routing info is suppressed by aggregate-address, it is still stored in RIPng database, but will'n't be notified to neighbor. On the other hand the aggregate-address will be notified to neighbor.

The command only be useful when the interface is L3.

### Examples

In the following example, RIPng specify an aggregate address into RIPng database:

```
Switch# configure terminal
Switch(config)#router ipv6 rip
Switch(config-router)# aggregate-address 2001:db8::/32
```

### Related Commands

None

## 7.2.15 route map(RIPng)

### Command Purpose

Use this command to set a route map for input or output filtering on a specified interface. Use the no parameter with this command to disable this function.

### Command Syntax

route-map *NAME* ( in | out ) *IFNAME*

no route-map name ( in | out ) *IFNAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | route map name | Up to 20 characters |
| in | route map for input filtering | - |
| out | route map for output filtering | - |
| IFNAME | Specify an interface name to which to associate the route map | Support physical/aggregation/loopback/vlan/tunnel ports |

## Command Mode

Router Configuration

## Default

None.

## Usage

None

## Examples

In the following example, set a route map for input filtering interface eth-0-1:

```
Switch# configure terminal
Switch(config)# router ipv6 rip
Switch(config-router)# route-map routemap10 in eth-0-1
```

## Related Commands

None

# 7.2.16 maximum-prefix(RIPng)

## Command Purpose

Use this command to configure the maximum prefix. Use the no parameter with this command to disable the limiting of the number of RIPng routes in the routing table.

## Command Syntax

maximum-prefix *NUMBER-VALUE* ( *PERCENTAGE-VALUE* | )

no maximum-prefix

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NUMBER-VALUE | maximum number of RIPng routes allowed | 1-65535 |
| PERCENTAGE-VALUE | Percentage of maximum routes to generate a warning.The default threshold is 75%. | 1-100 |

## Command Mode

Router Configuration

## Default

None.

## Usage

Use this command to configure the maximum prefix.

## Examples

In the following example, set maximum RIPng prefix is 700 and warning percentage is 70%:

```
Switch# configure terminal
Switch(config)# router ipv6 rip
Switch(config-router)# maximum-prefix 700 70
```

## Related Commands

None

# 7.2.17 show ipv6 rip database

## Command Purpose

Use this command to display RIPng information database.

## Command Syntax

show ipv6 rip database

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following is sample output from the show ip rip database command:

```
Switch# show ipv6 rip database
Codes: R - RIP, Rc - RIP connected, Rs - RIP static, Ra - RIP aggregated,
       Rcx - RIP connect suppressed, Rsx - RIP static suppressed,
       K - Kernel, C - Connected, S - Static, O - OSPF, I - IS-IS, B - BGP
   Network                    Next Hop                  If     Met Tag  Time
Rc 2001:db8:0:6::/64          ::                        eth-0-9    0   0
Rc 2001:db8:0:49::/64         ::                        eth-0-48   0   0
```

## Related Commands

show ipv6 rip interface

# 7.2.18 show ipv6 rip interface

## Command Purpose

To display summary information of Routing Information Protocol next generation (RIPng) for a specific interface, use the show ip rip interface command in privileged EXEC mode.

## Command Syntax

show ipv6 rip interface ( *IFNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | The interface name | Support physical/aggregation/loopback/vlan/tunnel ports |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following is sample output from the show ip rip interface command:

```
Switch# show ipv6 rip interface eth-0-9
eth-0-9 is up, line protocol is up
  Routing Protocol: RIPng
    Passive interface: Disabled
    Split horizon: Enabled with Poisoned Reversed
    IPv6 interface address:
      2001:db8:0:6::2/64
      fe80::b4df:82ff:fe70:ec00/10
```

### Related Commands

show ipv6 rip database

## 7.2.19 show ipv6 rip database database-summary

### Command Purpose

Use this command to display the summary statistics for RIPng database.

### Command Syntax

show ipv6 rip database database-summary

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following is sample output from the show ip rip database database-summary command:

```
Switch# show ipv6 rip database database-summary
Type                  Count
RIPng connected       2
Total                 2
```

### Related Commands

show ipv6 rip database

# 7.2.20 show ipv6 protocol rip

## Command Purpose

To show Routing Information Protocol next generation (RIPng), use the show ipv6 protocol rip command in privileged EXEC mode.

## Command Syntax

show ipv6 protocol rip

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following is sample output from the show ipv6 rip interface command:

```
Switch# show ipv6 protocol rip
Routing Protocol is "ripng"
  Sending updates every 30 seconds with +/-50%, next due in 2949331570 seconds
  Timeout after 180 seconds, garbage collect after 120 seconds
  Outgoing update filter list for all interface is not set
  Incoming update filter list for all interface is not set
  Default redistribute metric is 0
  Redistributing:
  Interface
    eth-0-9
    eth-0-48
  Routing for Networks:
  Number of routes (including connected): 2
  Distance: (default is 120)
```

## Related Commands

None

# 7.2.21 debug ipv6 rip

## Command Purpose

Use this command to specify the options for the displayed debugging information for RIPng events, RIPng packets.

Use the no parameter with this command to disable all debugging.

## Command Syntax

debug ipv6 rip ( all | events | packet | )

no debug ripv6 ( all | events | packet | )

no debug all ipv6 ( rip | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| all | All RIPng debug information | - |
| events | RIPng events debug information is displayed | - |
| packet | packet (recv\|send) (detail) Specifies RIPng packets only | - |
| recv | | - |
| send | | - |
| detail | | - |

## Command Mode

Privileged EXEC

## Default

Disabled

### Usage

None

### Examples

The following example displays information about the ripng packets that are received and sent out from the connected router:

```
Switch# debug ipv6 rip packet
```

### Related Commands

show debugging rip

## 7.2.22 show debugging ipv6 rip

### Command Purpose

Use this command to display the RIP debugging status for these debugging options: nsm debugging, RIP event debugging, RIP packet debugging.

### Command Syntax

show debugging ipv6 rip

### Command Mode

Privileged EXEC

### Default

None

### Usage

Use this command to display the debug status of RIPng.

### Examples

The following is sample output from the show debugging ripng command:

```
Switch# show debugging ipv6 rip
RIPng debugging status:
  RIPng event debugging is on
```

### Related Commands

debug ipv6 rip

## 7.2.23 show resource ipv6 rip

### Command Purpose

Use this command to display the route resources used by RIPng protocol.

### Command Syntax

show resource ipv6 rip

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following is sample output from the show resource ipv6 rip command:

```
Switch# show resource ipv6 rip
RIPng
Resource                          Used          Capability
============================================================
Routes                            2              728
```

## Related Commands

show ipv6 rip database

# 7.2.24 clear ipv6 rip route

## Command Purpose

To clear the specifical route in RIPng routing table, use the command clear ipv6 rip router in privileged exec mode.

## Command Syntax

clear ipv6 rip route ( *IPV6_PREFIX* | connected | static | ospfv3 | bgp | all )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IPV6_PREFIX | Removes entries which exactly match this destination address from the RIPng routing table. | IPv6 Address and mask length in X:X::X:X/M format |
| connected | Removes entries for connected routes from the RIPng routing table. | - |
| static | Removes static entries from the RIPng routing table | - |
| ospfv3 | Removes only OSPF routes from the RIPng routing table | - |
| bgp | Removes only BGP routes from the RIPng routing table | - |
| all | Removes the entire RIPng routing table | - |

## Command Mode

Privileged EXEC

## Default

None.

### Usage

Use this command to clear specific data from the RIPng routing table.

### Examples

In the following example, clear the entire RIPng routing table:

```
Switch# clear ipv6 rip route all
```

### Related Commands

None

## 7.3 IPv6UC Commands

### 7.3.1 ipv6 enable

### Command Purpose

Use this command to enable ipv6 function. Use the no form of this command to disable ipv6 function.

### Command Syntax

ipv6 enable

no ipv6 enable

### Command Mode

Global Configuration

### Default

Ipv6 function is disabled by default.

### Usage

This command is used to enable the ipv6 function globally. Ipv6 packet should be processed as a L2 packet when ipv6 function is disabled.

### Examples

The following example shows how to enable IPv6:

```
Switch# configure terminal
Switch(config)# ipv6 enable
```

### Related Commands

None

## 7.3.2 max-static-v6routes

### Command Purpose

To configure the maximum ipv6 static routes in system, use the max-static-v6routes command in global configuration mode. To configure the maximum static routes to default value, use the no form of this command.

### Command Syntax

max-static-v6routes *COUNT*

no max-static-v6routes

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| COUNT | The count of maximum ipv6 static routes. | 1-65535 |

### Command Mode

Global Configuration

### Default

Please reference the current TCAM profile.

## Usage

Users should not configure the maximum ipv6 static routes more than system profile of FIB. Also, users should not configure the maximum ipv6 static routes less than the current static routes count.

## Examples

The following example displays how to change maximum ipv6 static routes to 10:

```
Switch# configure terminal
Switch(config)# max-static-v6routes 10
```

## Related Commands

show ipv6 route

# 7.3.3 ipv6 route

## Command Purpose

To establish ipv6 static routes, use the ipv6 route command in global configuration mode.

To remove ipv6 static routes, use the no form of this command.

## Command Syntax

ipv6 route *DEST_PREFIX* ( ( *IFNAME* | ) *NH-ADDRESS* | *IFTUNNEL* ( *NH-ADDRESS* | ) | *IFNULL* ) ( *DISTANCE* | )

no ipv6 route *DEST_PREFIX* ( ( *IFNAME* | ) *NH-ADDRESS* | *IFTUNNEL* ( *NH-ADDRESS* | ) | *IFNULL* | )

ipv6 route vrf *VRF-NAME DEST_PREFIX* ( ( *IFNAME* | ) *NH-ADDRESS* | *IFNULL* ) ( *DISTANCE* | )

no ipv6 route vrf *VRF-NAME DEST_PREFIX* ( ( *IFNAME* | ) *NH-ADDRESS* | *IFNULL* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VRF-NAME | VRF instance name | Up to 31 characters |

| | | |
|---|---|---|
| DEST_PREFIX | IPv6 route prefix (in format X:X::X:X/M) for the destination | IPv6 Address and mask length in X:X::X:X/M format |
| NH-ADDRESS | IPv6 address (in format X:X::X:X) for the nexthop | IPv6 Address in X:X::X:X format |
| IFNAME | Outgoing interface for the ipv6 route | Support physical/aggregation/vlan and layer3 subif |
| IFTUNNEL | Tunnel interface name for the ipv6 route | tunnel <0-1023> |
| IFNULL | null 0 interface for the ipv6 route | null 0 |
| DISTANCE | (Optional) An administrative distance. The default administrative distance for a static route is 1. This configuration is optional. | 1-255 |

## Command Mode

Global Configuration

## Default

There is not any static IPv6 route configured by default.

## Usage

None

## Examples

```
Switch# configure terminal
Switch(config)# ipv6 route 3001::1/64 eth-0-2 fe80::1234
Switch(config)# ipv6 route vrf a 3002::1/64 3001::1
```

## Related Commands

show ipv6 route

## 7.3.4 ipv6 address

### Command Purpose

To set an IPv6 address for an interface, use the ipv6 address command in interface configuration mode. To remove an IPv6 address, use the no form of this command.

### Command Syntax

ipv6 address *GOLBAL_FREFIX* ( eui-64 | )

no ipv6 address *GOLBAL_FREFIX* ( eui-64 | )

ipv6 address *LINK-LOCAL* link-local

no ipv6 address *LINK-LOCAL* link-local

ipv6 address auto link-local

no ipv6 address auto link-local

no ipv6 address

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| GOLBAL_FREFIX | Global IPv6 address and prefix length. In X:X::X:X/M format | IPv6 Address and mask length in X:X::X:X/M format |
| LINK-LOCAL | Link-local IPv6 address. In X:X::X:X format | IPv6 Address in X:X::X:X format |

### Command Mode

Interface Configuration

### Default

There is not any ipv6 address on the interface by default.

### Usage

Use this command to configure ipv6 address on the interface. Use the no form of this command to remove the ipv6 address. This configuration should not affect the ipv4 functions and other ipv6 configuration on the interface.

The maximum count of the Link-local address is 1; the maximum count of the global address address is 8.

Use this command with the keyword "auto link-local" to automatically generate a link-local address, if there is no link-local address on this interface. Use the no form of this command with the keyword "auto link-local" to remove the automatically generated link-local address, if there is only that automatically generated link-local address left on this interface.

Use this command with a specified ipv6 address (e.g. 3ffe:506::1/48) to configure a global unicast ipv6 address. Use this command with the keyword "eui-64" to generate interface id automatically by the eui-64 algorithm. The global address should not be same. Use the no form of this command the remove the specified ipv6 global unicast address.

If there is no link-local address on the interface, system should automatically generate one when configure a global unicast ipv6 address.

Use this command with a specified ipv6 address (e.g. fe80::1) and a keyword "link-local" to configure a link-local address. Use the no form of this command with the specified ipv6 address and the keyword "link-local" to remove the specified ipv6 link-local address. The specified link-local address has a higher priority than the automatically generated the link-local address, that can overwrite the automatically generated one.

Use the no form of this command without any parameters or keywords to remove all ipv6 addresses on the interface, include ipv6 global addresses and link-local addresses.

## Examples

The following example shows how to configure link local address and global unicast address:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ipv6 address fe80::1233 link-local
Switch(config-if)# ipv6 address 3001:1::1234/64
```

## Related Commands

show ipv6 interface

# 7.3.5 show ipv6 route

## Command Purpose

Use this command to show the ipv6 routes.

## Command Syntax

show ipv6 route ( vrf *NAME* | ) ( database | )

show ipv6 route ( vrf *NAME* | ) ( database | ) ( bgp | connected | ospf | rip | static )

show ipv6 route ( vrf *NAME* | ) *IPV6_ADDRESS*

show ipv6 route ( vrf *NAME* | ) *IPV6_PREFIX*

show ipv6 route ( vrf *NAME* | )

show ipv6 route ( vrf *NAME* | ) summary

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IPV6_PREFIX | IPv6 prefix in X:X::X:X/M format | IPv6 Address and mask length in X:X::X:X/M format |
| IPV6_ADDRESS | IPv6 address in X:X::X:X format | IPv6 Address in X:X::X:X format |

## Command Mode

Privileged EXEC

## Default

None

## Usage

Use this command to show the ipv6 routes

## Examples

The following example shows the result of this command:

```
Switch# show ipv6 route
IPv6 Routing Table
Codes: C - connected, S - static, R - RIP, O - OSPF, I - IS-IS, B - BGP
       [*] - [AD/Metric]
Timers: Uptime
S       3001::/64 [1/0]
       via fe80::1234, eth-0-2, 04:09:56
C       3001:1::/64
       via ::, eth-0-1, 01:39:07
C       3001:1::1234/128
       via ::1, eth-0-1, 01:39:07
S       3002::/64 [1/0]
       via 3001::1 (recursive via fe80::1234), eth-0-2, 04:09:19
C       3ffe:2::/64
       via ::, eth-0-2, 1d19h37m
C       3ffe:2::10/128
       via ::1, eth-0-2, 1d19h37m
C       fe80::/10
       via ::, Null0, 1d19h53m

Switch# show ipv6 route database
IPv6 Routing Table
Codes: C - connected, S - static, R - RIP, O - OSPF, I - IS-IS, B - BGP
       [*] - [AD/Metric]
       > - selected route, * - FIB route, p - stale info
Timers: Uptime
S    >  3001::/64 [1/0]
     * via fe80::1234, eth-0-2, 04:10:45
C    >  3001:1::/64
     * via ::, eth-0-1, 01:39:56
C     >  3001:1::1234/128
      * via ::1, eth-0-1, 01:39:56
S    >  3002::/64 [1/0]
     * via 3001::1 (recursive via fe80::1234), eth-0-2, 04:10:08
C    >  3ffe:2::/64
     * via ::, eth-0-2, 1d19h37m
C     >  3ffe:2::10/128
      * via ::1, eth-0-2, 1d19h37m
C    >  fe80::/10
     * via ::, Null0, 1d19h54m

Switch# show ipv6 route static
IPv6 Routing Table
Codes: C - connected, S - static, R - RIP, O - OSPF, I - IS-IS, B - BGP
       [*] - [AD/Metric]
Timers: Uptime
S       3001::/64 [1/0]
       via fe80::1234, eth-0-2, 04:11:42
S       3002::/64 [1/0]
       via 3001::1 (recursive via fe80::1234), eth-0-2, 04:11:05

Switch# show ipv6 route 3001::64
Routing entry for 3001::/64
  Known via "static", distance 1, metric 0, best
  Last update 04:12:32 ago
```

```
  * via fe80::1234, eth-0-2

Switch# show ipv6 route 3001::64/64
Routing entry for 3001::/64
  Known via "static", distance 1, metric 0, best
  Last update 04:13:03 ago
  * via fe80::1234, eth-0-2

Switch# show ipv6 route summary
IPv6 routing table name is Default-IPv6-Routing-Table(0)
IPv6 routing table maximum-paths is 8
Route source networks
connected       5
static          2
Total           7
```

### Related Commands

ipv6 route

## 7.3.6 show ipv6 interface

### Command Purpose

Use this command to show the ipv6 ipv6 statues on the interface.

### Command Syntax

show ipv6 interface ( *IFNAME* | ) ( brief | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | IPv6 interface status and configuration | Support physical/aggregation/loopback/vlan/tunnel ports |
| brief | Brief summary of IPv6 status and configuration | - |

### Command Mode

Privileged EXEC

### Default

None

## Usage

None

## Examples

The following example shows the result of this command:

```
Switch# show ipv6 interface eth-0-1
Interface eth-0-1
  Interface current state: UP
  The maximum transmit unit is 1500 bytes
  IPv6 is enabled, link-local address is fe80::1233
  Global unicast address(es):
    3001:1::1234, subnet is 3001:1::/64
  Joined group address(es):
    ff02::1:ff00:1234
    ff02::1:ff00:0
    ff02::1:ff00:1233
    ff02::2
    ff02::1
  ICMP error messages limited to one every 2000 milliseconds
  ICMP redirects are always sent
  ND DAD is enabled, number of DAD attempts: 1
  ND router advertisement is disabled
  ND reachable time is 30000 milliseconds
  ND advertised reachable time is 0 milliseconds
  ND retransmit interval is 1000 milliseconds
  ND advertised retransmit interval is 0 milliseconds
  ND router advertisements max interval: 600 secs
  ND router advertisements min interval: 198 secs
  ND router advertisements live for 1800 seconds
  ND router advertisements hop-limit is 0
  Hosts use stateless autoconfig for addresses.
Switch # show ipv6 interface eth-0-1 brief
*down: administratively down
Interface           Status  Protocol  IPv6 address
eth-0-1             up      up        3001:1::1234
                                         fe80::1233

Switch# show ipv6 interface eth-0-1 brief
*down: administratively down
Interface           Status  Protocol  IPv6 address
eth-0-1             up      up        3001:1::1234
                                         fe80::1233
```

## Related Commands

ipv6 enable

ipv6 address

## 7.3.7 ipv6 verify unicast reverse-path

### Command Purpose

Use this command to enable urpf (unicast reverse path forwarding) on the interface.
Use the no form of this command to disable urpf on the interface.

### Command Syntax

ipv6 verify unicast reverse-path

no ipv6 verify unicast reverse-path

### Command Mode

Interface Configuration

### Default

Urpf is disabling on the interface by default.

### Usage

Use this command to enable urpf (unicast reverse path forwarding) on the interface.
Use the no form of this command to disable urpf on the interface.

### Examples

The following example shows how to enable URPF for IPv6:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ipv6 verify unicast reverse-path
```

### Related Commands

show ipv6 interface

## 7.3.8 ipv6 icmp error-interval

### Command Purpose

Use this command to set the ipv6 icmp error-interval. Use the no form of this command to set the ipv6 icmp error-interval to default.

### Command Syntax

no ipv6 icmp error-interval *ERROR_INTERVAL*

no ipv6 icmp error-interval

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| error-interval | ICMPv6 Error message interval. | 0-2147483647 ms |

### Command Mode

Global Configuration

### Default

1000 milliseconds.

### Usage

None

### Examples

The following example shows how to set the ICMPv6 error interval:

```
Switch# configure terminal
Switch(config)# ipv6 icmp error-interval 2000
```

### Related Commands

None

## 7.3.9 clear ipv6 route static

### Command Purpose

Use this command to clear static ipv6 routes.

### Command Syntax

clear ipv6 route static

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following example shows how to clear ipv6 static routes:

```
Switch# clear ipv6 route static
```

### Related Commands

None

# 7.4 Ipv6 Prefix-list Commands

## 7.4.1 ipv6 prefix-list

### Command Purpose

To create a ipv6 prefix list or add a prefix-list entry, use the ipv6 prefix-list command in global configuration mode.

To delete a prefix-list or an entry, use the no form of this command.

### Command Syntax

ipv6 prefix-list *WORD* [ seq *SEQUENCE-NUMBER* ] ( deny | permit ) ( any | *IPv6-ADDRESS/M* [ ge *GE-LENGTH* ] [ le *LE-LENGTH* ] )

no ipv6 prefix-list *WORD* [ seq *SEQUENCE-NUMBER* ] ( deny | permit ) ( any | *IPv6-ADDRESS/M* [ ge *GE-LENGTH* ] [ le *LE-LENGTH* ] )

no ipv6 prefix-list *WORD* [ seq *SEQUENCE-NUMBER* ]

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| WORD | Config a name to identify the prefix list | Up to 40 characters |
| seq SEQUENCE-NUMBER | Applies a sequence number to a prefix-list entry. The range of sequence number that can be entered is from 1 to 65535. If a sequence number is not entered when configuring this command, a default sequence numbering is applied to the prefix list. The number 5 is applied to the first prefix entry, and subsequent unnumbered entries are incremented by 5 | 1-65535 |
| deny | Denies access for a matching condition | - |
| permit | Permits access for a matching condition | - |

| | | |
|---|---|---|
| IPv6-ADDRESS /M | Configures the network address, and the length of the network mask in bits. The network number can be any valid IPv6 address or prefix. The bit mask can be a number from 0 to 128 | IPv6 address and mask length between 1-128 |
| ge GE-LENGTH | (Optional)Specifies the lesser value of a range (the "from" portion of the range description) by applying the ge-length argument to the range specified. The ge-length argument represents the minimum prefix length to be matched | 1-128 |
| le LE-LENGTH | (Optional)Specifies the greater value of a range (the "to" portion of the range description) by applying the le-length argument to the range specified. The le-length argument represents the maximum prefix length to be matched | 1-128 |

## Command Mode

Global Configuration

## Default

No prefix lists are created.

## Usage

The ipv6 prefix-list command is used to configure IPv6 prefix filtering. Prefix lists are configured with permit or deny keywords to either permit or deny the prefix based on the matching condition. A prefix list consists of an IPv6 address and a bit mask. The IPv6 address can be global address, or a link-local address. The bit mask is entered as a number from 1 to 128. An implicit deny is applied to traffic that does not match any prefix-list entry. Prefix lists are configured to match an exact prefix length or a prefix range. The ge and le keywords are used to specify a range

of the prefix lengths to match, providing more flexible configuration than can be configured with just the network/length argument. The prefix list is processed using an exact match when neither the ge nor le keyword is entered. If only the ge value is entered, the range is the value entered for the ge ge-length argument to a full 128-bit length. If only the le value is entered, the range is from value entered for the network/length argument to the le le-length argument. If both the ge ge-length and le le-length keywords and arguments are entered, the range falls between the values used for the ge-length and le-length arguments. The following formula shows this behavior:

network/length < ge ge-length < le le-length <= 128 .

A prefix list is configured with a name and/or sequence number. One or the other must be entered when configuring this command. If a sequence number is not entered, a default sequence number of 5 is applied to the prefix list. And subsequent prefix list entries will be increment by 5 (for example, 5, 10, 15, and onwards). If a sequence number is entered for the first prefix list entry but not subsequent entries, then the subsequent entries will also be incremented by 5 (For example, if the first configured sequence number is 3, then subsequent entries will be 8, 13, 18, and onwards). Default sequence numbers can be suppressed by entering the no form of this command with the seq keyword. Prefix lists are evaluated starting with the lowest sequence number and continues down the list until a match is made. Once a match is made that covers the network the permit or deny statement is applied to that network and the rest of the list is not evaluated.

## Examples

The following example shows how to configure ipv6 prefix-list: To deny the default route ::/0:

```
Switch# configure terminal
Switch(config)# ipv6 prefix-list abc deny ::/0
```

To permit the prefix 2001:db8::/64:

```
Switch# configure terminal
Switch(config)# ipv6 prefix-list abc permit 2001:db8::/64
```

To accept a mask length of up to 64 bits in routes with the prefix 2001:db8::/32:

```
Switch# configure terminal
Switch(config)# ipv6 prefix-list abc permit 2001:db8::/32 le 64
```

To deny mask lengths greater than 64 bits in routes with the prefix 2001:db8::/32:

```
Switch# configure terminal
Switch(config)# ipv6 prefix-list abc deny 2001:db8::/32 ge 64
```

### Related Commands

ipv6 prefix-list description

ipv6 prefix-list sequence

show ipv6 prefix-list

clear ipv6 prefix-list

## 7.4.2 ipv6 prefix-list description

### Command Purpose

To add a text description of a ipv6 prefix list, use the ipv6 prefix-list description command in global

configuration mode. To remove the text description, use the no form of this command

### Command Syntax

ipv6 prefix-list *WORD* description *LINE*

no ipv6 prefix-list *WORD* description [ *LINE* ]

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| WORD | Name of prefix list | Up to 40 characters |
| LINE | The description of this prefix-list | Up to 80 characters |

### Command Mode

Global Configuration

### Default

There is no description for prefix-list.

### Usage

The ipv6 prefix list will be created if it didn't exist.

### Examples

The following example shows how to add description:

```
Switch# configure terminal
Switch(config)# ipv6 prefix-list abc description Permit routes from customer A
```

### Related Commands

ipv6 prefix-list

ipv6 prefix-list sequence

show ipv6 prefix-list

clear ipv6 prefix-list

## 7.4.3 ipv6 prefix-list sequence-number

### Command Purpose

To enable the generation of sequence numbers for entries in a ipv6 prefix list, use the ipv6 prefix-list sequence-number command in global configuration mode. To disable this function, use the no form of this command.

### Command Syntax

ipv6 prefix-list sequence-number

no ipv6 prefix-list sequence-number

### Command Mode

Global Configuration

### Default

This command has no default behavior.

## Usage

This command is used to enable sequence-number display.

## Examples

The following example shows how to enable ipv6 prefix-list sequence-number:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ipv6 prefix-list sequence-number
```

## Related Commands

ipv6 prefix-list

show ipv6 prefix-list

clear ipv6 prefix-list

# 7.4.4 show ipv6 prefix-list

## Command Purpose

To show ipv6 prefix list information, use the show ipv6 prefix-list command.

## Command Syntax

show ipv6 prefix-list ( summary | detail | ) ( *WORD* | )

show ipv6 prefix-list *WORD* ( seq *SEQUENCE-NUMBER* | *IPv6-ADDRESS /M* ( longer | first-match | ) | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| summary | Summary of prefix lists | - |
| detail | Detail of prefix lists | - |
| WORD | Name of the prefix list | Up to 40 characters |
| seq SEQUENCE-NUMBER | sequence number of the entry in the ipv6 prefix list | 1-65535 |
| IPv6-ADDRESS /M | IPv6 prefix <network>/<length>, e.g., 2001:db8::/32 | IPv6 address and mask length between 1-128 |

| | | |
|---|---|---|
| longer | Lookup longer prefix | - |
| first-match | First matched prefix | - |

## Command Mode

Privileged EXEC

## Default

This command has no default behavior.

## Usage

None

## Examples

The following example shows how to display ip prefix-list:

```
Switch# show ipv6 prefix-list
ipv6 prefix-list ripng_pre: 5 entries
     seq 1 deny 2001:db8:9::/64
     seq 2 deny 2001:db8:10::/64
     seq 3 deny 2001:db8:11::/64
     seq 4 deny 2001:db8:12::/64
     seq 5 permit any
```

## Related Commands

ipv6 prefix-list

clear ipv6 prefix-list

# 7.4.5 clear ipv6 prefix-list

## Command Purpose

To Resets the hit count of the prefix list entries, use the clear ipv6 prefix-list command.

## Command Syntax

clear ipv6 prefix-list ( *WORD* ( *IPv6-ADDRESS /M* | ) | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| WORD | Name of the prefix list | Up to 40 characters |
| IPv6-ADDRESS /M | IPv6 prefix <network>/<length>, e.g., 2001:db8::/32 | IPv6 address and mask length between 1-128 |

### Command Mode

Privileged EXEC

### Default

This command has no default behavior.

### Usage

None

### Examples

The following example shows how to clear ipv6 prefix-list:

```
Switch(config)# clear ipv6 prefix-list test
```

### Related Commands

ipv6 prefix-list

## 7.5 Route Map Commands

### 7.5.1 route-map

### Command Purpose

To define the conditions for redistributing routes from one routing protocol into another, or to enable policy routing in bgp, use the route-map command in global configuration mode and the match and set command in route-map configuration modes.

To delete an entry, use the no form of this command.

## Command Syntax

route-map *MAP-TAG* [ permit | deny ] [ *SEQUENCE_NUMBER* ]

no route-map *MAP-TAG* [ permit | deny ] [ *SEQUENCE_NUMBER* ]

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MAP-TAG | A meaningful name for the route map. The redistribute router configuration command uses this name to reference this route map. Multiple route maps may share the same map tag name. | The length of route-map name should not greater than 20 and the first character should be 'a'-'z', 'A'-'Z' or '0'-'9'. |
| permit | (Optional) If the match criteria are met for this route map, and the permit keyword is specified, the route is redistributed as controlled by the set actions.<br>If the match criteria are not met, and the permit keyword is specified, the next route map with the same map tag is tested. If a route passes none of the match criteria for the set of route maps sharing the same name, it is not redistributed by that set. | - |
| deny | (Optional) If the match criteria are met for the route map and the deny keyword is specified, the route is not redistributed | - |
| SEQUENCE_NUMBER | (Optional) Number that indicates the position a new route map will have in the list of route maps already configured with the same name. If given with the no form of this command, the position of the route map should be deleted | 1-65535 |

## Command Mode

Global Configuration

## Default

The permit keyword is the default.

## Usage

None

## Examples

The following example shows how to create a route-map and enter route-map configuration mode:

```
Switch# configure terminal
Switch(config)# route-map rip-to-ospf permit
Switch(config-route-map)# match metric 1
Switch(config-route-map)# set metric 2
```

## Related Commands

match as-path

match community

match interface

match ip address

match local-preference

match metric

match origin

match route-type

match tag

set aggregator

set as-path

set atomic-aggregate

set comm-list

set community

set dampening

set extcommunity

set ip address

set local-preference

set metric

set metric-type

set origin

set originator-id

set tag

set vpnv4

set weight

## 7.5.2 match as-path

### Command Purpose

Use this command to match an autonomous system path access list.

Use the no parameter with this command to remove a path list entry.

The match as-path command specifies the autonomous system path to be matched. If there is a match for the specified AS path, and permit is specified, the route is redistributed or controlled, as specified by the set action. If the match criteria are met, and deny is specified, the route is not redistributed or controlled. If the match criteria are not met then the route is neither accepted nor forwarded, irrespective of permit or deny specifications.

The route specified by the policies might not be the same as specified by the routing protocols. Setting policies enable packets to take different routes,

depending on their length or content. Packet forwarding based on configured policies overrides packet forwarding specified in routing tables.

## Command Syntax

match as-path *LISTNAME*

no match as-path

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LISTNAME | Specifies as autonomous system path access list name | Up to 20 characters |

## Command Mode

Route-map Configuration

## Default

No match as-path is specified by default.

## Usage

This command is valid only for BGP.

## Examples

```
Switch# configure terminal
Switch(config)# route-map myroute deny 34
Switch(config-route-map)# match as-path myaccesslist
```

## Related Commands

match metric

match ip address

match community

set as-path

set community

# 7.5.3 match community

## Command Purpose

Use this command to specify the community to be matched.

Use the no parameter with this command to remove the community list entry.

Communities are used to group and filter routes. They are designed to provide the ability to apply policies to large numbers of routes by using match and set commands. Community lists are used to identify and filter routes by their common attributes.

Use the match community command to allow matching based on community lists.

The values set by the match community command overrides the global values. The route that does not match at least one match clause is ignored.

## Command Syntax

match community *WORD*

no match community

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| WORD | Specifies the Community-list name | Up to 40 characters |

## Command Mode

Route-map Configuration

## Default

No match community is specified by default.

## Usage

This command is valid only for BGP.

### Examples

```
Switch# configure terminal
Switch(config)# route-map myroute permit 3
Switch(config-route-map)# match community mylist
```

### Related Commands

match ip address

match as-path

set as-path

set community

match metric

## 7.5.4 match interface

### Command Purpose

Use this command to define the interface match criterion.

Use the no parameter with this command to remove the specified match criterion..

The match interface command specifies the next-hop interface name of a route to be matched.

### Command Syntax

match interface *IFNAME*

no match interface

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | A string that specifies the interface for matching | Support physical/aggregation/loop back/vlan/tunnel ports |

### Command Mode

Route-map Configuration

### Default

No match interface is specified by default.

### Usage

None

### Examples

```
Switch# configure terminal
Switch(config)# route-map mymap1 permit 10
Switch(config-route-map)# match interface eth-0-1
```

### Related Commands

match tag

match route-type external

## 7.5.5 match ipv6 address

### Command Purpose

Use this command to specify the match address of route.

Use the no parameter with this command to remove the match ipv6 address entry.

The match ipv6 address command specifies the IPv6 address to be matched. If there is a match for the specified IPv6 address, and permit is specified, the route is redistributed or controlled, as specified by the set action. If the match criteria are met, and deny is specified then the route is not redistributed or controlled. If the match criteria are not met, the route is neither accepted nor forwarded, irrespective of permit or deny specifications.

The route specified by the policies might not be the same as specified by the routing protocols. Setting policies enable packets to take different routes, depending on their length or content. Packet forwarding based on configured policies overrides packet forwarding specified in routing tables.

## Command Syntax

match ipv6 address *ACCESSSLISTID*

no match ipv6 address

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ACCESSSLISTID | Specify a IPv6 access-list name, up to 20 characters | Up to 20 characters |

## Command Mode

Route-map Configuration

## Default

No match ipv6 address is specified by default.

## Usage

This command is valid for BGP, OSPFv3 and RIPng only.

## Examples

```
Switch# configure terminal
Switch(config)# route-map myroute permit 3
Switch(config-route-map)# match ipv6 address List1
```

## Related Commands

match community

match as-path

set as-path

set community

match metric

# 7.5.6 match ipv6 address prefix-list

## Command Purpose

Use this command to match entries of ipv6 prefix-lists.

Use the no parameter with this command to disable this function

This command specifies the entries of prefix-lists to be matched. If there is a match for the specified ipv6 prefix-list entries, and permit is specified, the route is redistributed or controlled, as specified by the set action. If the match criteria are met, and deny is specified, the route is not redistributed or controlled. If the match criteria are not met, the route is neither accepted nor forwarded, irrespective of permit or deny specifications.

The route specified by the policies might not be the same as specified by the routing protocols. Setting policies enable packets to take different routes depending on their length or content. Packet forwarding based on configured policies overrides packet forwarding specified in routing tables.

## Command Syntax

match ipv6 address prefix-list *LISTNAME*

no match ipv6 address prefix-list ( *LISTNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LISTNAME | Specifies the IPv6 prefix list name | Up to 40 characters |

## Command Mode

Route-map Configuration

## Default

No match ipv6 address prefix-list is specified by default.

## Usage

This command is valid for BGP, OSPFv3 and RIPng only.

## Examples

```
Switch# configure terminal
Switch(config)# route-map rmap1 permit 3
Switch(config-route-map)#match ipv6 address prefix-list mylist
```

## Related Commands

match community

match as-path

set as-path

set community

match metric

# 7.5.7 match ipv6 next-hop

## Command Purpose

Use this command to specify a ipv6 next-hop address to be matched in a route-map.

Use the no parameter with this command to disable this function.

The match ipv6 next-hop command specifies the next-hop address to be matched. If there is a match for the specified next-hop address, and permit is specified, the route is redistributed or controlled as specified by the set action. If the match criteria are met, and deny is specified, the route is not redistributed or controlled. If the match criteria are not met, the route is neither accepted nor forwarded, irrespective of permit or deny specifications.

The route specified by the policies might not be the same as specified by the routing protocols. Setting policies enable packets to take different routes depending on their length or content. Packet forwarding based on configured policies overrides packet forwarding specified in routing tables.

## Command Syntax

match ipv6 next-hop ( *IPV6_ADDR* | *ACCESSSLISTID* )

no match ipv6 next-hop [ *IPv6-ADDRESS* | *ACCESSSLISTID* ]

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IPV6_ADDR | Specify a IPv6 address, e.g., 2001:db8::1 | IPv6 Address |
| ACCESSSLISTID | Specify a IPv6 access-list name | up to 20 characters |

## Command Mode

Route-map Configuration

## Default

No match ipv6 next-hop is specified by default.

## Usage

This command is valid for BGP, OSPFv3 and RIPng only.

## Examples

```
Switch# configure terminal
Switch(config)# route-map rmap1 permit 3
Switch(config-route-map)# match ipv6 next-hop mylist
```

## Related Commands

match community

match as-path

set as-path

set community

match metric

# 7.5.8 match ipv6 next-hop prefix-list

## Command Purpose

Use this command to specify the next-hop IPv6 address match criterion, using the prefix-list.

Use the no parameter with this command to remove the specified match criterion.

Use the match ipv6 next-hop prefix-list command to match the next-hop IPv6 address of a route.

## Command Syntax

match ipv6 next-hop prefix-list *LISTNAME*

no match ipv6 next-hop prefix-list [ *LISTNAME* ]

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LISTNAME | A string specifying the ipv6 prefix-list name | - |

## Command Mode

Route-map Configuration

## Default

No match ipv6 next-hop prefix-list is specified by default.

## Usage

This command is valid for RIPng only.

## Examples

```
Switch# configure terminal
Switch(config)# route-map mymap permit 3
Switch(config-route-map)# match ipv6 next-hop prefix-list list1
```

## Related Commands

match metric

match interface

match ip next-hop

# 7.5.9 match local-preference

## Command Purpose

Use this command to specify the local-preference match criterion.

Use the no parameter with this command to remove the specified match criterion.

Use the match local-preference command to match the local preference of a route.

## Command Syntax

match local-preference *LOCAL-PREFERENCE*

no match local-preference

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LOCAL-PREFERENCE | Species the preference value | 0-4294967295 |

## Command Mode

Route-map Configuration

## Default

No match local-preference is specified by default.

## Usage

This command is valid for BGP only.

## Examples

```
Switch# configure terminal
Switch(config)# route-map mymap permit 3
Switch(config-route-map)# match local-preference 100
```

## Related Commands

match community

match as-path

set as-path

set community

match ip next-hop

## 7.5.10 match metric

### Command Purpose

Use this command to match a metric of a route.

Use the no parameter with this command to disable this function.

The match metric command specifies the metric to be matched. If there is a match for the specified metric, and permit is specified, the route is redistributed or controlled as specified by the set action. If the match criteria are met, and deny is specified, the route is not redistributed or controlled. If the match criteria are not met, the route is neither accepted nor forwarded, irrespective of permit or deny specifications.

The route specified by the policies might not be the same as specified by the routing protocols. Setting policies enable packets to take different routes depending on their length or content. Packet forwarding based on configured policies overrides packet forwarding specified in routing tables.

### Command Syntax

match metric *METRICVAL*

no match metric

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| METRICVAL | metric value | 0-4294967295 |

### Command Mode

Route-map Configuration

### Default

No match metric is specified by default.

### Usage

This command is valid for BGP, OSPF and RIP only.

### Examples

```
Switch# configure terminal
Switch(config)# route-map myroute permit 3
Switch(config-route-map)# no match metric
```

### Related Commands

match community

match as-path

set as-path

set community

match ip next-hop

## 7.5.11 match origin

### Command Purpose

Use this command to match origin code.

Use the no parameter with this command to disable this matching.

The origin attribute defines the origin of the path information. The egp parameter is indicated as an e in the routing table, and it indicates that the origin of the information is learned via Exterior Gateway Protocol. The igp parameter is indicated as an i in the routing table, and it indicates the origin of the path information is interior to the originating AS.

The incomplete parameter is indicated as a ? in the routing table, and indicates that the origin of the path information is unknown or learned through other means. If a static route is redistributed into BGP, the origin of the route is incomplete.

The match origin command specifies the origin to be matched. If there is a match for the specified origin, and permit is specified, the route is redistributed or controlled as specified by the set action. If the match criteria are met, and deny is

specified, the route is not redistributed or controlled. If the match criteria are not met, the route is neither accepted nor forwarded, irrespective of permit or deny specifications.

The route specified by the policies might not be the same as specified by the routing protocols. Setting policies enable packets to take different routes depending on their length or content. Packet forwarding based on configured policies overrides packet forwarding specified in routing tables.

This command is valid for BGP only.

## Command Syntax

match origin { egp | igp | incomplete }

no match origin

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| egp | learned from EGP | - |
| igp | Local IGP | - |
| incomplete | Unknown heritage | - |

## Command Mode

Route-map Configuration

## Default

No match origin is specified by default.

## Usage

None

## Examples

```
Switch# configure terminal
Switch(config)# route-map myroute deny 34
Switch(config-route-map)# match origin egp
```

## Related Commands

None

# 7.5.12 match route-type

## Command Purpose

Use this command to match specified external route type.

Use the no parameter with this command to turn off the matching.

Use the match route-type external command to match specific external route types. AS-external LSA is either Type-1 or Type-2. External type-1 matches only Type 1 external routes, and external type-2 matches only Type 2 external routes.

## Command Syntax

match route-type external { type-1 | type-2 }

no match route-type external

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| type-1 | Match OSPF External Type 1 metrics | - |
| type-2 | Match OSPF External Type 1 metrics | - |

## Command Mode

Route-map Configuration

## Default

No match route-type is specified by default.

## Usage

This command is valid for OSPF only.

## Examples

```
Switch# configure terminal
Switch(config)# route-map mymap1 permit 10
Switch(config-route-map)# match route-type external type-1
```

## Related Commands

match tag

# 7.5.13 match tag

## Command Purpose

Use this command to match the specified tag value.

Use the no parameter with this command to turn off the declaration.

Use the match tag command to match the specified tag value.

## Command Syntax

match tag *TAG*

no match tag

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| TAG | Specifies the tag value | 0-4294967295 |

## Command Mode

Route-map Configuration

## Default

No match tag is specified by default.

## Usage

This command is valid for OSPF RIP only.

## Examples

```
Switch# configure terminal
Switch(config)# route-map mymap1 permit 10
Switch(config-route-map)# match tag 100
```

### Related Commands

match metric

match route-type external

## 7.5.14 set ipv6 aggregator

### Command Purpose

Use this command to set the AS number for the route map and router ID.

Use the no parameter with this command to disable this function.

An Autonomous System (AS) is a collection of networks under a common administration sharing a common routing strategy. It is subdivided by areas, and is assigned a unique 16-bit number. Use the set aggregator command to

assign an AS number for the aggregator.

To use the set aggregator command, you must first have a match clause. Match and set commands set the conditions for redistributing routes from one routing protocol to another. The match command specifies the match criteria under which redistribution is allowed for the current route-map. The set command specifies the set redistribution actions to be performed, if the match criteria are met.

If the packets do not match any of the defined criteria, they are routed through the normal routing process.

### Command Syntax

set ipv6 aggregator as *ASNUM IPV6_ADDR*

no set ipv6 aggregator

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ASNUM | Specifies the AS number of aggregator | 1-65535 |
| IPV6_ADDR | Specifies the IPv6 address of aggregator | IPv6 Address |

### Command Mode

Route-map Configuration

### Default

No set aggregator is specified by default.

### Usage

This command is valid for BGP only.

### Examples

```
Switch# configure terminal
Switch(config)# route-map myroute permit 3
Switch(config-route-map)# set aggregator as 43 2001:db8::1
```

### Related Commands

None

## 7.5.15 set as-path

### Command Purpose

Use this command to modify an autonomous system path for a route.

Use the no parameter with this command to disable this function.

Use the set as-path command to specify an autonomous system path. By specifying the length of the AS-Path, the router influences the best path selection by a neighbor. Use the prepend parameter with this command to prepend an AS path string to routes increasing the AS path length.

To use the set as-path command, you must first have a match clause. Match and set commands set the conditions for redistributing routes from one routing protocol to another. The match command specifies the match criteria under which redistribution is allowed for the current route-map. The set command specifies the set redistribution actions to be performed, if the match criteria are met.

If the packets do not match any of the defined criteria, they are routed through the normal routing process.

## Command Syntax

set as-path prepend *ASN* [ ...*ASN* ]

no set as-path

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ASN | System prepends this number to the AS path | 1-4294967295 |
| prepend | Prepends the autonomous system path | - |

## Command Mode

Route-map Configuration

## Default

No set as-path is specified by default.

## Usage

This command is valid for BGP only.

## Examples

```
Switch# configure terminal
Switch(config)# route-map myroute permit 3
Switch(config-route-map)# set as-path prepend 8 24
```

## Related Commands

None

# 7.5.16 set atomic-aggregate

## Command Purpose

Use this command to set an atomic aggregate attribute.

Use the no parameter with this command to disable this function

To use the set atomic aggregate command, you must first have a match clause. Match and set commands set the conditions for redistributing routes from one routing protocol to another. The match command specifies the match criteria under which redistribution is allowed for the current route-map. The set command specifies the set redistribution actions to be performed, if the match criteria are met.

If the packets do not match any of the defined criteria, they are routed through the normal routing process.

## Command Syntax

set atomic-aggregate

no set atomic-aggregate

## Command Mode

Route-map Configuration

## Default

No set atomic-aggregate is specified by default.

## Usage

This command is valid for BGP only.

## Examples

```
Switch# configure terminal
Switch(config)# route-map rmap1 permit 3
Switch(config-route-map)# set atomic-aggregate
```

## Related Commands

None

## 7.5.17 set comm-list delete

### Command Purpose

Use this command to delete the matched communities from the community attribute of an inbound or outbound update when applying route-map.

Use the no parameter with this command to disable this feature.

### Command Syntax

set comm-list { *STANDARD* | *EXPANDED* | *WORD* } delete

no set comm-list

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| STANDARD | Standard community-list number | 1-99 |
| EXPANDED | Expanded community-list number | 100-199 |
| WORD | Name of the Community-list | up to 255 characters |
| delete | Delete matching communities | - |

### Command Mode

Route-map Configuration

### Default

No set comm-list is specified by default.

### Usage

This command is valid for BGP only.

### Examples

```
Switch# configure terminal
Switch(config)# route-map rmap1 permit 3
Switch(config-route-map)# set comm-list 34 delete
```

## Related Commands

None

# 7.5.18 set community

## Command Purpose

Use this command to set the communities attribute.

Use the no parameter with this command to delete the entry.

Use this command to set the community attribute and group destinations in a certain community, as well as, apply routing decisions according to those communities.

To use the set community command, you must first have a match clause. Match and set commands set the conditions for redistributing routes from one routing protocol to another. The match command specifies the match criteria under which redistribution is allowed for the current route-map. The set command specifies the set redistribution actions to be performed, if the match criteria are met.

If the packets do not match any of the defined criteria, they are routed through the normal routing process.

## Command Syntax

set community [ *AA:NN* | internet | *local-AS* | no-advertise | no-export ]

set community none

no set community

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| AA:NN | AA:NN: Specifies the community number in this format<br>AA = The AS number<br>NN = The number assigned to community | Support 2 bytes AS number and 4 bytes community ID |
| internet | Specifies the Internet (well-known community) | - |

| | | |
|---|---|---|
| local-AS | Specifies no sending outside the local AS (well-known community) | - |
| no-advertise | Specifies no advertisement of this route to any peer (well-known community) | - |
| no-export | Specifies no advertisement of this route to next AS (well-known community) | - |
| none | Removes the community attribute from the prefixes that pass the route-map | - |

## Command Mode

Route-map Configuration

## Default

No set community is specified by default.

## Usage

This command is valid for BGP only.

## Examples

The following examples show the use of the set community command with different parameters:

```
Switch# configure terminal
Switch(config)# route-map rmap1 permit 3
Switch(config-route-map)# set community no-export no-advertise
Switch# configure terminal
Switch(config)# route-map rmap1 permit 3
Switch(config-route-map)# set community no-advertise
Switch# configure terminal
Switch(config)# route-map rmap1 permit 3
Switch(config-route-map)# set community 10:01 23:34 12:14 no-export
```

## Related Commands

None

# 7.5.19 set dampening

## Command Purpose

Use this command to enable route-flap dampening and set parameters.

Use the no parameter with this command to disable it.

Set the unreachability half-life time to be equal to, or greater than, reachability half-life time. The suppress-limit value must be greater than or equal to the reuse limit value.

## Command Syntax

set dampening *REACHTIME REUSE SUPPRESS MAXSUPPRESS* [ *UNREACHTIME* ]

no set dampening

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| REACHTIME | Specifies the reachability half-life time in minutes. The time for the penalty to decrease to one-half of its current value. The default is 15 minutes | 1-45 |
| REUSE | Specifies the reuse-limit value. When the penalty for a suppressed route decays below the reuse value, the routes become unsuppressed. The default reuse limit is 750 | 1-20000 |
| SUPPRESS | Specifies the suppress-limit value. When the penalty for a route exceeds the suppress value, the route is suppressed. The default suppress limit is 2000 | 1-20000 |
| MAXSUPPRESS | Specifies the max-suppress-time. Maximum time that a dampened route is suppressed. The default max-suppress value is 4 times the half-life time (60 minutes) | 1-255 |

| | | |
|---|---|---|
| UNREACHTIME | Specifies the un-reachability half-life time for penalty, in minutes. The default value is 15 minutes | 1-45 |

## Command Mode

Route-map Configuration

## Default

Reference to the syntax description above.

## Usage

This command is valid for BGP only.

## Examples

```
Switch# configure terminal
Switch(config)# route-map R1 permit 24
Switch(config-route-map)# set dampening 20 333 534 30
```

## Related Commands

None

# 7.5.20 set extcommunity

## Command Purpose

Use this command to set an extended community attribute.

Use the no parameter with this command to disable this function

To use the set extcommunity command, you must first have a match clause. Match and set commands set the conditions for redistributing routes from one routing protocol to another. The match command specifies the match criteria under which redistribution is allowed for the current route-map. The set command specifies the set redistribution actions to be performed, if the match criteria are met.

If the packets do not match any of the defined criteria, they are routed through the normal routing process.

## Command Syntax

set extcommunity { rt | soo } *EXTCOMMNUMBER* [ ...*EXTCOMMNUMBER* ]

no set extcommunity { rt | soo }

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| rt | Specifies the route target of the extended community | - |
| soo | Specifies the site-of-origin of the extended community | - |
| EXTCOMMNUMBER | ASN:NN_or_IP-address:nn VPN extended community | - |
| ASN:NN | the AS number | Support 2 bytes AS number and 4 bytes community ID |
| IPADDRESS | the AS number in IP address form | IPv4 Address |

## Command Mode

Route-map Configuration

## Default

No set extcommunity is specified by default.

## Usage

This command is valid for BGP only.

## Examples

```
Switch# configure terminal
Switch(config)# route-map rmap1 permit 3
Switch(config-route-map)# set extcommunity rt 06:01
Switch# configure terminal
Switch(config)# route-map rmap1 permit 3
Switch(config-route-map)# set extcommunity rt 0.0.0.6:01
Switch# configure terminal
```

```
Switch(config)# route-map rmap1 permit 3
Switch(config-route-map)# set extcommunity soo 06:01
Switch# configure terminal
Switch(config-route-map)# route-map rmap1 permit 3
Switch(config-route-map)# set extcommunity soo 0.0.0.6:01
```

### Related Commands

None

## 7.5.21 set ipv6 next-hop

### Command Purpose

Use this command to set the specified next-hop ipv6 address value.

Use the no parameter with this command to turn off the setting.

Use this command to set the next-hop IPv6 address to the routes.

### Command Syntax

set ipv6 next-hop [ local ] *IPV6_ADDR*

no set ipv6 next-hop [ local ]

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| local | Link-local address | - |
| IPV6_ADDR | Specifies the IPv6 address of the next-hop | IPv6 Address |

### Command Mode

Route-map Configuration

### Default

No set ipv6 next-hop is specified by default.

### Usage

This command is valid for BGP, OSPFv3, and RIPng only.

### Examples

```
Switch# configure terminal
Switch(config)# route-map mymap permit 3
Switch(config-route-map)# set ipv6 next-hop 2001:db8::1
```

### Related Commands

None

## 7.5.22 set local-preference

### Command Purpose

Use this command to set the specified local-preference value.

Use the no parameter with this command to turn off the setting.

Use this command to set the local-preference value of the routes

### Command Syntax

set local-preference *LOCAL-PREFERENCE*

no set local-preference

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LOCAL-PREFERENCE | Species the preference value | 0-4294967295 |

### Command Mode

Route-map Configuration

### Default

No set local-preference is specified by default.

### Usage

This command is valid for BGP only.

## Examples

```
Switch# configure terminal
Switch(config)# route-map mymap permit 3
Switch(config-route-map)# set local-preference 100
```

## Related Commands

None

# 7.5.23 set metric

## Command Purpose

Use this command to set a metric value for a route.

Use the no parameter with this command to disable this function.

This command sets the metric value for a route, and influences external neighbors about the preferred path into an Autonomous System (AS). The preferred path is the one with a lower metric value. A router compares metrics for paths from neighbors in the same ASs. To compare metrics from neighbors coming from different ASs, use the bgp always-compare-med command.

To use the set metric command, you must first have a match clause. Match and set commands set the conditions for redistributing routes from one routing protocol to another. The match command specifies the match criteria under which redistribution is allowed for the current route-map. The set command specifies the set redistribution actions to be performed, if the match criteria are met.

If the packets do not match any of the defined criteria, they are routed through the normal routing process.

## Command Syntax

set metric *METRICVAL*

no set metric

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| METRICVAL | metric value | 0-4294967295 |

### Command Mode

Route-map Configuration

### Default

No set metric is specified by default.

### Usage

This command is valid for BGP, OSPF and RIP.

### Examples

```
Switch# configure terminal
Switch(config)# route-map rmap1 permit 3
Switch(config-route-map)# set metric 600
```

### Related Commands

None

## 7.5.24 set metric-type

### Command Purpose

Use this command to set the metric type for the destination routing protocol.

Use the no parameter with this command to return to the default.

This command sets the type to either Type-1 or Type-2 in the AS-external-LSA when the route-map matches the condition.

### Command Syntax

set metric-type { *TYPE1* | *TYPE2* }

no set metric-type

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| type1 | Select to set external type 1 metric | - |

| | | |
|---|---|---|
| type2 | Select to set external type 2 metric | - |

## Command Mode

Route-map Configuration

## Default

No set metric-type is specified by default.

## Usage

This command is valid for OSPF only.

## Examples

```
Switch# configure terminal
Switch(config)# route-map rmap1 permit 3
Switch(config-route-map)# set metric-type 1
```

## Related Commands

None

# 7.5.25 set origin

## Command Purpose

Use this command to set the BGP origin code.

Use the no parameter with this command to delete an entry.

The origin attribute defines the origin of the path information. The three parameters with this command indicate three different values. IGP is interior to the originating AS. This happens if IGP is redistributed into the BGP. EGP is learned through an Exterior Gateway Protocol. Incomplete is unknown or learned through some other means. This happens when static route is redistributed in BGP and the origin of the route is incomplete.

To use the set origin command, you must first have a match clause. Match and set commands set the conditions for redistributing routes from one routing protocol to

another. The match command specifies the match criteria under which redistribution is allowed for the current route-map. The set command specifies the set redistribution actions to be performed, if the match criteria are met.

If the packets do not match any of the defined criteria, they are routed through the normal routing process.

## Command Syntax

set origin { egp | igp | incomplete }

no set origin

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| egp | Specifies a remote EGP system | - |
| igp | A local IGP system | - |
| incomplete | Specifies a system of unknown heritage | - |

## Command Mode

Route-map Configuration

## Default

No set origin is specified by default.

## Usage

This command is valid for BGP only.

## Examples

```
Switch# configure terminal
Switch(config)# route-map rmap1 permit 3
Switch(config-route-map)# set origin egp
```

## Related Commands

None

# 7.5.26 set ipv6 originator-id

## Command Purpose

Use this command to set the originator ID attribute.

Use the no parameter with this command to disable this function

To use the set originator-id command, you must first have a match clause. Match and set commands set the conditions for redistributing routes from one routing protocol to another. The match command specifies the match criteria under which redistribution is allowed for the current route-map. The set command specifies the set redistribution actions to be performed, if the match criteria are met.

If the packets do not match any of the defined criteria, they are routed through the normal routing process.

## Command Syntax

set ipv6 originator-id *IPV6_ADDR*

no set ipv6 originator-id

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IPV6_ADDR | Specifies the IPv6 address of originator | IPv6 Address |

## Command Mode

Route-map Configuration

## Default

No set originator-id is specified by default.

## Usage

This command is valid for BGP only.

## Examples

```
Switch# configure terminal
Switch(config)# route-map rmap1 permit 3
Switch(config-route-map)# set ipv6 originator-id 2001:db8::1
```

## Related Commands

None

# 7.5.27 set tag

## Command Purpose

Use this command to set a specified tag value.

Use the no parameter with this command to return to the default.

Tag in this command is the route tag which is labeled by another routing protocol (BGP or other IGP when redistributing), because AS-external-LSA has a route-tag field in its LSAs. Also, with using route-map, ZebOS can tag the LSAs with the appropriate tag value. Sometimes, the tag matches with using route-map, and sometimes, the value

may be used by another application.

## Command Syntax

set tag *TAGVALUE*

no set tag

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| TAGVALUE | Tag value for destination routing protocol. | 0-4294967295 |

## Command Mode

Route-map Configuration

## Default

No set tag is specified by default.

### Usage

This command is valid for OSPF and RIP only.

### Examples

```
Switch# configure terminal
Switch(config)# route-map rmap1 permit 3
Switch(config-route-map)# set tag 6
```

### Related Commands

redistribute

default-information

## 7.5.28 set vpnv6 next-hop

### Command Purpose

Use this command to set a VPNv6 next-hop address.

Use the no parameter with this command to disable this function

To use the set vpn6-hext-hop command, you must first have a match clause. Match and set commands set the conditions for redistributing routes from one routing protocol to another. The match command specifies the match criteria under which redistribution is allowed for the current route-map. The set command specifies the set redistribution actions to be performed, if the match criteria are met.

If the packets do not match any of the defined criteria, they are routed through the normal routing process.

### Command Syntax

set vpnv6 next-hop *IPV6_ADDR*

no set vpnv6 next-hop

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IPV6_ADDR | Specifies the IPv6 address of originator | IPv6 Address |

### Command Mode

Route-map Configuration

### Default

No set vpnv6 next-hop is specified by default.

### Usage

This command is valid for BGP only.

### Examples

```
Switch# configure terminal
Switch(config)# route-map rmap1 permit 3
Switch(config-route-map)# set vpnv6 next-hop 2001:db8::1
```

### Related Commands

None

## 7.5.29 set weight

### Command Purpose

Use this command to set weights for the routing table.

Use the no parameter with this command to delete an entry.

The weight value is used to assist in best path selection. It is assigned locally to a router. When there are several routes with a common destination, the routes with a higher weight value are preferred.

To use the set weight command, you must first have a match clause. Match and set commands set the conditions for redistributing routes from one routing protocol to another. The match command specifies the match criteria under which redistribution is allowed for the current route-map. The set command specifies the set redistribution actions to be performed, if the match criteria are met

match as-path 10

set weight 400

In the above configuration, all routes that apply to access-list 10 will have the weight set at 400.

If the packets do not match any of the defined criteria, they are routed through the normal routing process.

## Command Syntax

set weight *WEIGHT*

no set weight

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| WEIGHT | Specifies the weight value | 0-4294967295 |

## Command Mode

Route-map Configuration

## Default

No set weight is specified by default.

## Usage

This command is valid for BGP only.

## Examples

```
Switch# configure terminal
Switch(config)# route-map rmap1 permit 3
Switch(config-route-map)# set weight 60
```

## Related Commands

match as-path

# 7.5.30 show route-map

## Command Purpose

Use this command to display user readable route-map information.

## Command Syntax

show route-map [ *NAME* ]

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | route-map name | The length of route-map name should not greater than 20 and the first character should be 'a'-'z', 'A'-'Z' or '0'-'9'. |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

```
Switch1# show route-map
route-map abc, permit, sequence 10
  Match clauses:
    ip address acl1
  Set clauses:
    local-preference 200
route-map abc, permit, sequence 20
  Match clauses:
  Set clauses:
```

## Related Commands

route-map

# 7.6 IPv6 BGP Commands

## 7.6.1 address-family

### Command Purpose

Use this command to enter the IPv6 address-family command mode.

### Command Syntax

address-family ipv6 ( unicast | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| unicast | Specifies unicast prefixes. | - |

### Command Mode

Router Configuration

### Default

None

### Usage

Use the address family command to enter the address family mode allowing configuration of address-family specific parameters.

To leave the address family mode and return to the Configure mode use the exit-address-family command.

### Examples

```
Switch# configure terminal
Switch(config) router bgp 100
Switch(config-router)address-family ipv6
```

### Related Commands

exit-address-family

## 7.6.2 aggregate-address

### Command Purpose

Use this command to configure BGP aggregate entries.

Use the no parameter with this command to disable this function.

### Command Syntax

( no ) aggregate-address *IPADDRESS* { summary-only | as-set }

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IPV6_ADDR | X:X::X:X/M Specifies the aggregate prefix | IPv6 address |
| summary-only | Filters more specific routes from updates. | - |
| as-set | Generates AS set path information | - |

### Command Mode

Address Family Configuration

### Default

Disabled

### Usage

Aggregates are used to minimize the size of routing tables. Aggregation combines the characteristics of several different routes and advertises a single route.The aggregate-address command creates an aggregate entry in the BGP routing table if any more-specific BGP routes are available in the specified range. Using the summary-only parameter advertises the prefix only, suppressing the more-specific routes to all neighbors.

### Examples

```
Switch# configure terminal
Switch(config)# router bgp 100
Switch(config-router)# aggregate-address 2018::1/64 as-set summary-only
```

### Related Commands

N/A

## 7.6.3 bgp always-compare-med

### Command Purpose

Use this command to compare the Multi Exit Discriminator (MED) for paths from neighbors in different autonomous systems.

Use the no parameter with this command to disallow the comparison.

### Command Syntax

( no ) bgp always-compare-med

### Command Mode

Router Configuration

### Default

Disabled

### Usage

Multi Exit Discriminator (MED) is used in best path selection by BGP. MED is compared after BGP attributes weight, local preference, AS-path and origin have been compared and are equal.

MED comparison is done only among paths from the same autonomous system (AS). Use bgp always-comparemed command to allow comparison of MEDs from different ASs. The MED parameter is used to select the best path. A path with lower MED is preferred.

### Examples

```
Switch# configure terminal
Switch(config)# router bgp 100
Switch(config-router)# bgp always-compare-med
```

### Related Commands

bgp bestpath med

bgp bestpath as-path ignore

## 7.6.4 bgp as-local-count

### Command Purpose

When AS path is transfered between EBGP neighbor or Confederated IBGP neighbor, uses this command to specify the number of the local AS number prepended to the AS path.

Use the no parameter with this command to remove this configuration.

### Command Syntax

bgp as-local-count *NUM*

no bgp as-local-count

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NUM | The number of the local AS number prepended to the AS path. | 2-64 |

### Command Mode

Router Configuration

### Default

In the default case, the number of the switch AS prepended to the AS path is 1.

### Usage

Use this command to configure the number of prepended local-as number.

### Examples

```
Switch# configure terminal
Switch(config)# router bgp 100
Switch(config-router)# bgp as-local-count 5
```

### Related Commands

N/A

## 7.6.5 bgp bestpath as-path ignore

### Command Purpose

Use this command to prevent the router from considering as-path as a factor in the algorithm for choosing a route.

Use the no parameter with this command to allow the router to consider as-path in choosing a route.

### Command Syntax

( no ) bgp bestpath as-path ignore

### Command Mode

Router Configuration

### Default

Disabled

### Usage

None

### Examples

```
Switch# configure terminal
Switch(config) router bgp 100
Switch(config-router) bgp bestpath as-path ignore
```

### Related Commands

bgp always-compare-med, bgp bestpath med, bgp bestpath compare-routerid

## 7.6.6 bgp bestpath compare-confed-aspath

### Command Purpose

Use this command to allow comparing of the confederation AS path length.

Use the no parameter with this command to revert the selection and ignore AS confederation path length in the BGP best path selection.

### Command Syntax

( no ) bgp bestpath compare-confed-aspath

### Command Mode

Router Configuration

### Default

BGP receives routes with identical eBGP paths from eBGP peers and selects the first route received as the best path.

### Usage

This command specifies that the AS confederation path length must be used, when available, in the BGP best path decision process. It is effective only when bgp bestpath as-path ignore command has not been specified.

### Examples

```
Switch# configure terminal
Switch(config) router bgp 100
Switch(config-router) bgp bestpath compare-confed-aspath
```

### Related Commands

bgp bestpath as-path ignore

## 7.6.7 bgp bestpath compare-routerid

### Command Purpose

Use this command to compare router-id for identical eBGP paths.

Use the no parameter with this command to disable this function.

### Command Syntax

( no ) bgp bestpath compare-routerid

### Command Mode

Router Configuration

### Default

BGP receives routes with identical eBGP paths from eBGP peers and selects the first route received as the best path.

### Usage

When comparing similar routes from peers the BGP router does not consider router ID of the routes. By default, it selects the first received route. Use this command to include router ID in the selection process; similar routes are compared and the route with lowest router ID is selected. The router-id is the highest IP address on the router, with preference given to loopback addresses. Router-id can be manually set by using the bgp router-id command.

### Examples

```
Switch# configure terminal
Switch(config) router bgp 100
Switch(config-router) bgp bestpath compare-routerid
```

### Related Commands

show bgp ipv6

show ip bgp neighbors

## 7.6.8 bgp bestpath dont-compare-originator-id

### Command Purpose

Use this command to prevent the router from considering originator-id as a factor in the algorithm for choosing a route.

Use the no parameter with this command to allow the router to consider originator-id in choosing a route.

### Command Syntax

( no ) bgp bestpath dont-compare-originator-id

### Command Mode

Router Configuration

### Default

In the default case, BGP will consider originator-id as a factor in choosing a route.

### Usage

Use this command to prevent BGP to consider originator-id as a factor in choosing a route.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 100
Switch(config-router)# bgp bestpath dont-compare-originator-id
```

## Related Commands

N/A

# 7.6.9 bgp bestpath med

## Command Purpose

Use this command to specify Multi Exit Discriminator (MED) attribute comparison.

Use the no parameter with this command to prevent BGP from considering the MED attribute in comparing paths.

## Command Syntax

bgp bestpath med confed [ missing-as-worst ]

bgp bestpath med missing-as-worst [ confed ]

no bgp bestpath med confed [ missing-as-worst ]

no bgp bestpath med missing-as-worst [ confed ]

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| confed | Compares MED among confederation paths | - |
| missing-as-worst | Treats missing MED as the least preferred one | - |

## Command Mode

Router Configuration

## Default

MED value is zero.

### Usage

Use this command to specify two MED attributes-confed and missing-as-worst. The confed attribute enables MED comparison among paths learned from confederation peers. The MEDs are compared only if there is no external autonomous system (an AS not within the confederation) in the path. If there is an external autonomous system in the path, the MED comparison is not made.

The missing-as-worst attribute to consider a missing MED attribute in a path as having a value of infinity, making the path without a MED value the least desirable path. If missing-as-worst is disabled, the missing MED is assigned the value of 0, making the path with the missing MED attribute the best path.

### Examples

```
Switch# configure terminal
Switch(config) router bgp 100
Switch(config-router) bgp bestpath med missing-as-worst
```

### Related Commands

bgp-always-compare-med, bgp bestpath as-path ignore, bgp deterministic-med

## 7.6.10 bgp bestpath tie-break-on-age

### Command Purpose

Use this command to preferentially choose old routes when other condition is the same in the algorithm for choosing a route.

Use the no parameter with this command to compare addtional information in route choosing rather than the age of route.

### Command Syntax

( no ) bgp bestpath tie-break-on-age

### Command Mode

Router Configuration

### Default

In the default case, BGP will preferentially choose an old route when other condition is the same.

### Usage

When the the information that influence the quality of routing like aspath、local-preference、med is the same，preferentially chose the old route to prevent route flap.

Use the no parameter with this command to let BGP compara addtional information like router-id、neighbor's address，instead of the age of routes.

### Examples

```
Switch# configure terminal
Switch(config)# router bgp 100
Switch(config-router)# no bgp bestpath tie-break-on-age
```

### Related Commands

N/A

## 7.6.11 bgp client-to-client reflection

### Command Purpose

Use this command to restore route reflection from a BGP route reflector to clients.

Use the no parameter with this command to turn off client-to-client reflection.

### Command Syntax

bgp client-to-client reflection

no bgp client-to-client reflection

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| reflection | Allows reflection of routes | - |

### Command Mode

Router Configuration

### Default

When a router is configured as a route reflector, client-to-client reflection is enabled by default.

### Usage

The bgp client-to-client reflection command is used to configure routers as route reflectors. Route reflectors are used when all Interior Border Gateway Protocol (iBGP) speakers are not fully meshed. If the clients are fully meshed the route reflector is not required, use no bgp client-to-client reflection command to disable the client-to-client route reflection.

### Examples

```
Switch# configure terminal
Switch(config) router bgp 100
Switch(config-router) no bgp client-to-client reflection
```

### Related Commands

bgp cluster-id

neighbor route-reflector-client

show bgp ipv6

## 7.6.12 bgp cluster-id

### Command Purpose

Use this command to configure the cluster ID if the BGP cluster has more than one route reflector.

Use the no parameter with this command to remove the cluster ID.

## Command Syntax

bgp cluster-id *CLUSTERID*

no bgp cluster-id

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| CLUSTERID | A.B.C.D\|<1-4294967295> Specifies the cluster ID of this router acting as a route reflector, either as IP address or as a maximum of 4 bytes. | IPv4 Address or Number between 1-4294967295 |
| A.B.C.D | A.B.C.D Route Reflector Cluster-id in IP address format | IPv4 Address |
| <1-4294967295> | Route Reflector cluster-id as a 32 bit quantity | 1-4294967295 |

## Command Mode

Router Configuration

## Default

N/A

## Usage

A cluster includes route reflectors and its clients. Usually, each cluster is identified by the router ID of its single route reflector but to increase redundancy sometimes a cluster may have more than one route reflector. All router reflectors in such a cluster are then identified by a cluster ID. The bgp cluster-id command is used to configure the 4 byte cluster ID for clusters with more than one route reflectors.

## Examples

```
Switch# configure terminal
Switch(config) router bgp 100
Switch(config-router) bgp cluster-id 1.1.1.1
```

### Related Commands

bgp client-to-client reflection, neighbor route-reflector-client, show bgp ipv6

## 7.6.13 bgp confederation identifier

### Command Purpose

Use this command to specify a Bgp confederation identifier.

Use the no parameter with this command to remove the Bgp confederation identifier.

### Command Syntax

bgp confederation identifier *ID*

no bgp confederation identifier

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ID | Set routing domain confederation AS number | 1-65535 |

### Command Mode

Router Configuration

### Default

N/A

### Usage

N/A

### Examples

```
Switch# configure terminal
Switch(config) router bgp 100
Switch(config-router) bgp confederation identifier 1
```

### Related Commands

bgp confederation peer

## 7.6.14 bgp confederation peers

### Command Purpose

Use this command to configure the Autonomous Systems (AS) that belong to the confederation.

Use the no parameter with this command to remove an autonomous system from the confederation.

### Command Syntax

bgp confederation peers *.ASN*

no bgp confederation peers ( *.ASN* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ASN | AS numbers of eBGP peers that are under same confederation but in a different sub-AS | 1-65535 |

### Command Mode

Router Configuration

### Default

N/A

### Usage

A confederation allows an AS to be divided into several ASs. The AS is given a confederation identifier. External routers view only the whole confederation as one AS. Each AS is fully meshed within itself and is visible internally to the confederation. Use the bgp confederation peer command to define the list of confederation peers.

### Examples

```
Switch# configure terminal
Switch(config) router bgp 100
Switch(config-router) bgp confederation peers 1234 21345
```

### Related Commands

bgp confederation identifier

## 7.6.15 bgp dampening

### Command Purpose

Use this command to set bgp dampening parameters.

Use the no parameter with this command to unset the bgp dampening parameters.

### Command Syntax

bgp dampening *REACHTIME*

bgp dampening *REACHTIME REUSE*

bgp dampening *REACHTIME REUSE SUPPRESS MAXSUPPRESS* ( *UNREACHTIME* | )

bgp dampening route-map *ROUTEMAP*

no bgp dampening *REACHTIME*

no bgp dampening *REACHTIME REUSE*

no bgp dampening *REACHTIME REUSE SUPPRESS MAXSUPPRESS* ( *UNREACHTIME* | )

no bgp dampening route-map *ROUTEMAP*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| REACHTIME | Specifies the reachability half-life time in minutes. The time for the penalty to decrease to one-half of its current value. The default is 15 minutes. | 1-45 |

| | | |
|---|---|---|
| REUSE | Specifies the reuse limit value. When the penalty for a suppressed route decays below the reuse value, the routes become unsuppressed. The default reuse limit is 750 SUPPRESS <1-20000> Specifies the suppress limit value. When the penalty for a route exceeds the suppress value, the route is suppressed. The default suppress limit is 2000. | 1-20000 |
| SUPPRESS | Specifies suppress-time.A route dampening more than this value will be suppressd. The default value is 2000. | 1-20000 |
| MAXSUPPRESS | Specifies the max-suppress-time. Maximum time that a dampened route is suppressed. The default max-suppress value is 4 times the half-life time (60 minutes). | 1-255 |
| UNREACHTIME | Specifies the un-reachability half-life time for penalty, in minutes. | 1-45 |
| ROUTEMAP | route-map WORD Route-map to specify criteria for dampening. | The length of route-map name should not greater than 20 and the first character should be 'a'-'z', 'A'-'Z' or '0'-'9'. |

## Command Mode

Router Configuration

Address Family Configuration

## Default

N/A

## Usage

Route dampening minimizes the instability caused by route flapping. A penalty is added for every flap in a flapping route. As soon as the total penalty reaches the suppress limit the advertisement of the route is suppressed. This penalty is decayed according to the configured half time value. Once the penalty is lower than the reuse limit, the route advertisement is un-suppressed.

The dampening information is purged from the router once the penalty becomes less than half of the reuse limit.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 100
Switch(config-router)# bgp dampening 20 800 2500 80 25
```

## Related Commands

N/A

# 7.6.16 bgp default local-preference

## Command Purpose

Use this command to change the default local preference value.

Use the no parameter with this command to revert to the default setting.

## Command Syntax

bgp default local-preference *PREF_VALUE*

no default local-preference ( *PREF_VALUE* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PREF_VALUE | Configure default local preference value. The default local preference value is 100. | 0-4294967295 |

### Command Mode

Router Configuration

### Default

The default local preference value is 100.

### Usage

Local preference indicates the preferred path when there are multiple paths to the same destination. The path having a higher preference is preferred. Use bgp default local-preference command to define preference of a particular path. The preference is sent to all routers and access servers in the local autonomous system.

### Examples

```
Switch# configure terminal
Switch(config) router bgp 100
Switch(config-router) bgp default local-preference 2345555
```

### Related Commands

N/A

## 7.6.17 bgp deterministic-med

### Command Purpose

Use this command to compare the Multi Exit Discriminator (MED) variable when choosing among routes advertised by different peers in the same autonomous system.

Use the no parameter with this command to disallow this setting.

### Command Syntax

bgp deterministic-med

no bgp deterministic-med

## Command Mode

Router Configuration

## Default

Disabled

## Usage

"Multi Exit Discriminator (MED) is used in best path selection by BGP. MED is compared after BGP attributes weight, local preference, AS-path and origin have been compared and are equal. Enable bgp deterministic med command on all routers in the local AS, for a correct comparison result. After enabling this command, all paths for the same prefix are grouped together and arranged according to their MED value.

Based on this comparison, the best path is then chosen.

This command compares MED variable when choosing routes advertised by different peers in the same AS, to compare MED, when choosing routes from neighbors in different ASs use the bgp always-compare-med command."

## Examples

```
Switch# configure terminal
Switch(config) router bgp 100
Switch(config-router) bgp deterministic-med
```

## Related Commands

show bgp ipv6, show bgp ipv6 neighbors

# 7.6.18 bgp enforce-first-as

## Command Purpose

Use this command to specifies that any updates received from an external neighbor that do not have the neighbor's configured Autonomous System (AS) at the beginning of the AS_PATH in the received update must be denied.

Use the no parameter with this command to disable this feature.

### Command Syntax

bgp enforce-first-as

no bgp enforce-first-as

### Command Mode

Router Configuration

### Default

Disabled

### Usage

Enabling this feature adds to the security of the BGP network by not allowing traffic from unauthorized systems.

### Examples

```
Switch# configure terminal
Switch(config)# router bgp 100
Switch(config-router)# bgp enforce-first-as
```

### Related Commands

N/A

## 7.6.19 bgp fast-external-failover

### Command Purpose

Use this command to reset a BGP session immediately, if the interface used for BGP connection goes down.

Use the no parameter with this command to disable this feature.

### Command Syntax

bgp fast-external-failover

no bgp fast-external-failover

### Command Mode

Router Configuration

### Default

Enabled

### Usage

None

### Examples

```
Switch# configure terminal
Switch(config)# router bgp 100
Switch(config-router)# bgp fast-external-failover
```

### Related Commands

N/A

## 7.6.20 bgp log-neighbor-changes

### Command Purpose

Use this command to enable logging of status change messages without turning on debug bgp commands.

Use the no parameter with this command to disable this feature.

### Command Syntax

bgp log-neighbor-changes

no bgp log-neighbor-changes

## Command Mode

Router Configuration

## Default

Disabled

## Usage

System implementation provides other kinds of logging services for neighbor status, for example, debug bgp fsm, debug bgp events, etc. However, these commands create a significant hit in the logging performance.

The bgp log-neighbor-changes command, logs the following events:

- BGP Notification Received
- Erroneous BGP Update Received
- User reset request
- Peer time-out
- Peer Closing down the session
- Interface flap
- Router ID changed
- Neighbor deleted
- Member added to peer group
- Administrative shutdown
- Remote AS changed
- RR client configuration modification
- Soft reconfiguration modification

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 100
Switch(config-router)# bgp log-neighbor-changes
```

## Related Commands

N/A

# 7.6.21 bgp router-id

## Command Purpose

Use this command to configure the router identifier.

Use the no parameter with this command to disable this function

## Command Syntax

bgp router-id *ROUTERID*

no bgp router-id ( *ROUTERID* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ROUTERID | A.B.C.D Manually configured router ID. | In IPv4 Address format |

## Command Mode

Router Configuration

Address Family Configuration

## Default

In case the loopback interface is configured the router-id is set to the IP address of a loopback interface. If not, the highest IP address is the router-id.

## Usage

Use bgp router-id command to manually configure a fixed router ID as a BGP router identifier.

### Examples

```
Switch# configure terminal
Switch(config) router bgp 100
Switch(config-router) bgp router-id 1.1.2.3
```

### Related Commands

N/A

## 7.6.22 bgp scan-time

### Command Purpose

Use this command to set the interval for BGP route next-hop scanning.

Use the no parameter with this command to disable this function.

### Command Syntax

bgp scan-time *TIME*

no bgp scan-time ( *TIME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| TIME | Scanning interval in seconds. The default scanning interval is 60 seconds. | 0-60 |

### Command Mode

Router Configuration

### Default

N/A

### Usage

Use this command to configure scanning intervals of BGP routers. This interval is the period after which router checks the validity of the routes in its database.

To disable BGP scanning, set the scan time interval to 0 seconds.

## Examples

```
Switch# configure terminal
Switch(config) router bgp 100
Switch(config-router) bgp scan-time 10
```

## Related Commands

N/A

# 7.6.23 clear bgp ipv6 *

## Command Purpose

Use this command to reset a BGP connection for all peers.

## Command Syntax

clear bgp ipv6 * ( in | out | soft | )

clear bgp ipv6 * vrf *NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| * | clears all bgp peers | - |
| in | Indicates that incoming advertised routes will be cleared | - |
| out | Indicates that outgoing advertised routes will be cleared. | - |
| soft | soft (in\|out\|) Indicates that both incoming and outgoing routes will be cleared | - |
| vrf | VPN routing/forwarding instance | - |
| NAME | VPN Routing/Forwarding instance name | Up to 31 characters |

## Command Mode

Privileged EXEC

### Default

N/A

### Usage

There are two kinds BGP reset, hard reset will clear BGP peers and establish again. Soft reset only refresh routing table.

### Examples

```
Switch# clear bgp ipv6 *
Switch# clear bgp ipv6 * soft
Switch# clear bgp ipv6 * vrf aa
```

### Related Commands

N/A

## 7.6.24 clear bgp ipv6 X:X::X:X

### Command Purpose

Use this command to reset a IPv6 BGP connection for a specific IPv6 address.

### Command Syntax

clear bgp ipv6 *X:X::X:X* ( in | out | soft )

clear ipv6 bgp *X:X::X:X* vrf *NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| X:X::X:X | Specifies the IPv6 address of the BGP route to be cleared | IPv6 address |
| in | Indicates that incoming advertised routes will be cleared | - |
| out | Indicates that outgoing advertised routes will be cleared. | - |

| | | |
|---|---|---|
| soft | soft (in\|out\|) Indicates that both incoming and outgoing routes will be cleared | - |
| vrf | VPN routing/forwarding instance | - |
| NAME | VPN Routing/Forwarding instance name | Up to 31 characters |

## Command Mode

Privileged EXEC

## Default

N/A

## Usage

N/A

## Examples

```
Switch# clear bgp ipv6 2018::1
Switch# clear bgp ipv6 2018::1 soft
```

## Related Commands

N/A

# 7.6.25 clear bgp ipv6 unicast dampening

## Command Purpose

Use this command to reset all dampened BGP routes under the specified address family.

## Command Syntax

clear bgp ipv6 dampening ( *X:X::X:X* | *X:X::X:X/M* | )

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| X:X::X:X | Specifies the IPv6 address for which Bgp dampening is to be cleared. | IPv6 address |
| X:X::X:X/M | Specifies the IPv6 address with mask for which Bgp dampening is to be cleared. | IPv6 address with mask length |

## Command Mode

Privileged EXEC

## Default

N/A

## Usage

N/A

## Examples

```
Switch# clear bgp ipv6  unicast dampening
Switch# clear bgp ipv6  unicast dampening 2018::1
```

## Related Commands

N/A

# 7.6.26 clear bgp ipv6 unicast flap-statistics

## Command Purpose

Use this command to clear the flap count and history duration for all the prefixes under the specified address family.

## Command Syntax

clear bgp ipv6 unicast flap-statistics ( *X:X::X:X* | *X:X::X:X/M* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| X:X::X:X | Specifies the IPv6 address for which Bgp dampening is to be cleared. | IPv6 address |
| X:X::X:X/M | Specifies the IPv6 address with mask for which Bgp dampening is to be cleared. | IPv6 address with mask length |

### Command Mode

Privileged EXEC

### Default

N/A

### Usage

N/A

### Examples

```
Switch# clear bgp ipv6 unicast flap-statistics 10.10.0.121
```

### Related Commands

N/A

## 7.6.27 clear bgp ipv6 ASN

### Command Purpose

Use this command to reset a BGP connection for all peers in a specified Autonomous System.

### Command Syntax

clear bgp ipv6 *ASN* ( in | out | soft | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ASN | Specifies the AS Number for which all routes will be cleared | 1-4294967295 |
| in | Indicates that incoming advertised routes will be cleared | - |
| out | Indicates that outgoing advertised routes will be cleared. | - |
| soft | soft (in\|out\|) Indicates that both incoming and outgoing routes will be cleared | - |

## Command Mode

Privileged EXEC

## Default

N/A

## Usage

N/A

## Examples

```
Switch# clear bgp ipv6 100
```

## Related Commands

N/A

# 7.6.28 clear bgp ipv6 external

## Command Purpose

Use this command to reset a BGP connection for all external peers.

## Command Syntax

clear bgp ipv6 external ( in | sotf | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| external | Clears all external peers | - |
| in | Indicates that incoming advertised routes will be cleared | - |
| soft | soft (in\|out\|) Indicates that both incoming and outgoing routes will be cleared | - |

## Command Mode

Privileged EXEC

## Default

N/A

## Usage

N/A

## Examples

```
Switch# clear bgp ipv6 external in
```

## Related Commands

N/A

# 7.6.29 clear bgp ipv6 peer-group

## Command Purpose

Use this command to reset a BGP connection for all members of a peer group.

## Command Syntax

clear bgp ipv6 peer-group *WORD* ( in | out | soft | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| peer-group | Clears all members of a peer group | - |
| WORD | Specifies the name of the peer group for which all members will be cleared. | Up to 20 characters |
| in | Indicates that incoming advertised routes will be cleared | - |
| out | Indicates that outgoing advertised routes will be cleared. | - |
| soft | soft (in\|out\|) Indicates that both incoming and outgoing routes will be cleared | - |

## Command Mode

Privileged EXEC

## Default

N/A

## Usage

None

## Examples

```
Switch# clear bgp ipv6 peer-group Peer1 out
```

## Related Commands

N/A

# 7.6.30 debug bgp

## Command Purpose

Use this command to specify all debugging options for BGP. Use the no parameter with this command to disable this function.

## Command Syntax

debug bgp ( all | dampening | events | filters | fsm | keepalives | mpls | updates )

no debug bgp ( all | dampening | events | filters | fsm | keepalives | mpls | nsm | updates )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| all | Used with the no form exclusively; turns off all debugging for BGP | - |
| dampening | Specifies debugging for Bgp dampening. | - |
| events | Specifies debugging for BGP events. | - |
| filters | Specifies debugging for BGP filters. | - |
| fsm | Specifies debugging for BGP Finite State Machine (FSM). | - |
| mpls | Specifies debuggin for BGP Multiprotocol Label Switching. | - |
| keepalives | Specifies debugging for BGP keepalives. | - |
| updates | updates Specifies debugging for BGP updates. | - |

## Command Mode

Privileged EXEC

## Default

N/A

### Usage

This command without any parameters turns on normal bgp debug information.

### Examples

```
Switch# debug bgp
Switch# debug bgp events
```

### Related Commands

N/A

## 7.6.31 default-information originate

### Command Purpose

Use this command to distribute default route between neighbors.

Use the no parameter with this command to disable the distributing of default route.

### Command Syntax

( no ) default-information originate

### Command Mode

Router Configuration

### Default

In the default case, BGP will not distribute the default route to neighbors.

### Usage

When the swtich has default route, using this command will distribute default route to BGP neighbors.

In the default case, BGP will not distribute default route.

### Examples

```
Switch# configure terminal
Switch(config)# router bgp 100
Switch(config-router)# default-information originate
```

### Related Commands

N/A

## 7.6.32 distance

### Command Purpose

Use this command to define an administrative distance.

Use the no parameter with this command to remove an administrative distance.

### Command Syntax

distance bgp *ED ID LD*

no distance bgp

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ED | Distance of EBGP routes. | 1-255 |
| ID | Distance of IBGP routes. | 1-255 |
| LD | Distance of local routes. | 1-255 |

### Command Mode

Router Configuration

Address Family Configuration

### Default

N/A

### Usage

Use this command to set the administrative distance for BGP. This distance is a rating of trustworthiness of a router.

The higher the distance the lower the trust rating.

The administrative distance can be set for external, internal and local routes. External paths are routes learned from a neighbor out of the AS. The internal routes are routes learned from another router within the same AS. Local routes are for the router that is being redistributed from another process.

If the administrative distance is changed, it could create inconsistency in the routing table and obstruct routing.

### Examples

```
Switch# configure terminal
Switch(config)# router bgp 100
Switch(config-router)# address-family ipv6
Switch(config-router-af)# distance bgp 200 150 10
```

### Related Commands

N/A

## 7.6.33 exit-address-family

### Command Purpose

Use this command to exit the address family mode.

### Command Syntax

exit-address-family

### Command Mode

Address Family Configuration

### Default

N/A

### Usage

N/A

## Examples

The following example shows the use of exit-address-family command and the change in the prompt after using this command:

```
Switch# configure terminal
Switch(config)# router bgp 100
Switch(config-router)# address-family ipv6
Switch(config-router-af)# exit-address-family
Switch(config-router)#
```

## Related Commands

address-family

# 7.6.34 ip as-path access-list

## Command Purpose

Use this command to define a BGP Autonomous System (AS) path access list.

Use the no parameter with this command to disable use of the access list.

## Command Syntax

ip as-path access-list *LISTNAME* ( deny | permit ) *LINE*

no ip as-path access-list *LISTNAME* ( deny | permit ) *LINE*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LISTNAME | Specifies the name of the access list. | Up to 40 characters, the first character must be among [a-zA-Z0-9] |
| deny | (Optional) Denies access to matching conditions. | - |
| permit | (Optional) Permits access to matching conditions. | - |
| LINE | Specifies a regular expression to match the BGP AS paths. | A regular expression to match the BGP AS paths |

## Command Mode

Global Configuration

## Default

N/A

## Usage

Named community list is a filter based on regular expressions. If the regular expression matches the specified string representing the AS path of the route, then the permit or deny condition applies. Use this command to define the BGP access list globally, use the neighbor router configuration command to apply a specific access list.

## Examples

```
Switch# configure terminal
Switch(config)# ip as-path access-list mylist deny ^65535$
```

## Related Commands

N/A

# 7.6.35 ip community-list

## Command Purpose

Use this command to add a community list entry.

Use the no parameter with this command to delete the community list entry.

## Command Syntax

ip community-list *LISTNUM* ( deny | permit ) *COMMUNITY*

no ip community-list *LISTNUM* ( deny | permit ) *COMMUNITY*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LISTNUM | Specifies the community ID.<br>1-99:Standard list<br>100-199:Expandes list | 1-199 |
| deny | Specifies the community to reject. | - |

| | | |
|---|---|---|
| permit | Specifies the community to accept. | - |
| COMMUNITY | (AA:NN\|internet\|local-AS\|no-advertise\|no-export) | - |
| AA:NN | Specifies the valid value for the community number. This format represents the 32 bit communities value, where AS is the high order 16 bits and VAL is the low order 16 bits in digit format. | AA is in the range 1-65535 NN is in the range of 1-65535 |
| internet | Specifies routes not to be advertised to the Internet. | - |
| local-AS | Specifies routes not to be advertised to external BGP peers. | - |
| no-advertise | Specifies routes not to be advertised to other BGP peers. | - |
| no-export | Specifies routes not to be advertised outside of Autonomous System boundary. | - |

## Command Mode

Global Configuration

## Default

N/A

## Usage

Use the community-lists to specify BGP community attributes. The community attribute is used for implementing policy routing. It is an optional, transitive attribute and facilitates transfer of local policies through different autonomous systems. It includes community values that are 32 bits long.

There are two kinds of community-lists: the expanded and standard. The standard community-list defines the community attributes in a specified format and not with regular expressions. The expanded community-list defines the communities attributes with regular expressions.

## Examples

```
Switch# configure terminal
Switch(config)# ip community-list 20 permit 7675:80 7675:90
```

## Related Commands

ip community-list standard

ip community-list expanded

# 7.6.36 ip community-list expanded

## Command Purpose

Use this command to add a community list entry.

Use the no parameter with this command to delete the community list entry.

## Command Syntax

ip community-list expanded *WORD* ( deny | permit ) *LINE*

no ip community-list expanded *WORD* ( deny | permit ) *LINE*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| expanded | Add an expanded community-list entry. | - |
| WORD | Expanded community list name | Up to 20 characters |
| deny | Specifies community to reject. | - |
| permit | Specifies community to accept. | - |
| LINE | Specifies a regular expression to match the BGP AS paths. | A regular expression |

## Command Mode

Global Configuration

## Default

N/A

## Usage

Use the community-lists to specify BGP community attributes. The community attribute is used for implementing policy routing. It is an optional, transitive attribute and facilitates transfer of local policies through different autonomous systems. It includes community values that are 32 bits long.

There are two kinds of community-lists-the expanded and standard. The standard community-list defines the community attributes in a specified format and not with regular expressions. The expanded community-list defines the communities attributes with regular expressions.

## Examples

```
Switch# configure terminal
Switch(config)# ip community-list expanded CLIST permit .*
```

## Related Commands

ip community-list

ip community-list standard

# 7.6.37 ip community-list standard

## Command Purpose

Use this command to add a standard community-list entry.

Use the no parameter with this command to delete the standard community-list entry.

## Command Syntax

ip community-list standard *WORD* ( deny | permit ) *COMMUNITY*

no ip community-list standard *WORD* ( deny | permit ) *COMMUNITY*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| standard | Specifies a standard community list. | - |
| WORD | Standard community list name | Up to 20 characters |
| deny | Specifies community to reject. | - |
| permit | Specifies community to accept. | - |
| COMMUNITY | (AA:NN\|internet\|local-AS\|no-advertise\|no-export) | - |
| AA: NN | Specifies the valid value for the community number. This format represents the 32 bit communities value, where AS is the high order 16 bits and VAL is the low order 16 bits in digit<br>Specifies the valid value for the community number. This format represents the 32 bit communities value, where AS is the high order 16 bits and VAL is the low order 16 bits in digit format. | AA is in the range 1-65535<br>NN is in the range of 1-65535 |
| internet | Specifies routes not to be advertised to the Internet. | - |
| local-AS | Specifies routes not to be advertised to external BGP peers. | - |
| no-advertise | Specifies routes not to be advertised to other BGP peers. | - |
| no-export | Specifies routes not to be advertised outside of the Autonomous System boundary. | - |

## Command Mode

Global Configuration

## Default

N/A

## Usage

Use the community-lists to specify BGP community attributes. The community attribute is used for implementing policy routing. It is an optional, transitive attribute and facilitates transfer of local policies through different autonomous systems. It includes community values that are 32 bits long.

There are two kinds of community-lists-the expanded and standard. The standard community-list defines the community attributes in a specified format without regular expressions. The expanded community-list defines the communities attributes with regular expressions.

Use the ip community-list standard command to add a standard community-list entry. The standard community-list is compiled into binary format and is directly compared with the BGP communities attribute in the BGP updates. The comparison is faster than the expanded community-list. Any community value that does not match the standard community value is automatically treated as expanded.

## Examples

```
Switch# configure terminal
Switch(config)# ip community-list standard CLIST permit 7675:80 7675:90 no-export
```

## Related Commands

ip community-list

ip community-list expanded

# 7.6.38 max-paths

## Command Purpose

Use this command to change the maximum ecmp.

Use the no parameter with this command to revert to the default setting.

## Command Syntax

max-paths ( ebgp | ibgp ) *PATHS*

no max-paths ( ebgp | ibgp ) ( *PATHS* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ebgp | Session EBGP ECMP | - |
| ibgp | Session IBGP ECMP | - |
| PATHS | Set multipath ECMP numbers for BGP | 2-64 |

## Command Mode

Router Configuration

## Default

The default local preference value is 1.

## Usage

None

## Examples

The following example shows how to configure max-paths.:

```
Switch# configure terminal
Switch(config)# router bgp 100
Switch(config-router)# max-paths ebgp 2
```

## Related Commands

N/A

# 7.6.39 neighbor activate

## Command Purpose

Use this command to enable the exchange of the specified AF routes with a neighboring router.

Use the no parameter with this command to disable exchange of information with a neighbor.

## Command Syntax

neighbor *NEIGHBORID* activate

no neighbor *NEIGHBORID* activate

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (X:X::X:X\|TAG) | - |
| X:X::X:X | Specifies the address of the BGP neighbor in IPv6 format. | IPv6 Address |
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | - |

## Command Mode

Router Configuration

Address Family Configuration

## Default

N/A

## Usage

After the TCP connection is opened with the neighbor, this command is used to enable or disable the exchange of the specified AF information with a neighboring router.

To enable the exchange of multicast and VPNv4 address prefix types, neighbors are activated using the neighbor activate command in address family mode.

### Examples

```
Switch# configure terminal
Switch(config)# router bgp 10
Switch(config-router)# address-family ipv6
Switch(config-router-af)# neighbor 2018::1 active
```

### Related Commands

neighbor remote-as

## 7.6.40 neighbor advertisement-interval

### Command Purpose

Use this command to set the minimum interval between sending the BGP routing updates.

Use the no parameter with this command to set the interval time to default.

### Command Syntax

neighbor *NEIGHBORID* advertisement-interval *TIME*

no neighbor *NEIGHBORID* advertisement-interval *TIME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (X:X::X:X\|TAG) | - |
| X:X::X:X | Specifies the address of the BGP neighbor in IPv6 format. | - |
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | - |
| TIME | Advertise -interval value in seconds | 0-600 |

### Command Mode

Router Configuration

### Default

N/A

### Usage

Use this command to set the minimum interval between the sending of BGP routing updates. To reduce the flapping of routes to internet, a minimum advertisement interval is set, so that the BGP routing updates are sent only per interval seconds. bgp dampening can also be used to control the effects of flapping routes.

### Examples

```
Switch# configure terminal
Switch(config)# router bgp 10
Switch(config-router)# neighbor 2018::1 advertisement-interval 45
```

### Related Commands

N/A

## 7.6.41 neighbor allowas-in

### Command Purpose

Use this command to configure PE routers to allow re-advertisement of all prefixes containing duplicate Autonomous System Numbers (ASNs).

Use the no parameter with this command to disable the readvertisement of a PE router's ASN.

### Command Syntax

neighbor *NEIGHBOR* allowas-in [ *NUMBER* ]

no neighbor *NEIGHBOR* allowas-in

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (X:X::X:X\|TAG) | - |
| X:X::X:X | Specifies the address of the BGP neighbor in IPv6 format. | IPv6 Address |
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |
| NUMBER | Number of occurances of AS number.Default value is 1 | 1-10 |

## Command Mode

Address Family Configuration

## Default

Disabled

## Usage

In a hub and spoke configuration, a PE router re-advertises all prefixes containing duplicate ASNs. Use the neighbor allowas-in command to configure two VRFs on each PE router to receive and re-advertise prefixes. One of the VRFs receives prefixes with ASNs from all PE routers and then advertises them to neighboring PE routers. The other VRF receives prefixes with ASNs from the CE router and re-advertises them to all PE routers in the hub and spoke configuration.

Control the number of times an ASN is advertised, by specifying a number from 1 to 10.

### Examples

```
Switch# configure terminal
Switch(config-router)# address-family ipv6
Switch(config-router-af)# neighbor 2018::1 allowas-in 3
```

### Related Commands

N/A

## 7.6.42 neighbor as-origination-interval

### Command Purpose

Use this command to set the minimum interval between ready to send the originated BGP routing updates.

Use the no parameter with this command to set the interval time to default.

### Command Syntax

neighbor *NEIGHBOR* allowas-in [ *NUMBER* ]

no neighbor *NEIGHBOR* allowas-in

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (X:X::X:X\|TAG) | - |
| X:X::X:X | Specifies the address of the BGP neighbor in IPv6 format. | IPv6 Address |
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |
| TIME | Advertise -interval value in seconds | 0-600 |

## Command Mode

Router Configuration

## Default

N/A

## Usage

Use this command to set the minimum interval between the ready to send of originated BGP routing updates. For the originated bgp routes， they would be sent out when as-origination-interval and advertisement-interval expired at the same time.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 10
Switch(config-router)# neighbor 3000::1 advertisement-interval 45
```

## Related Commands

N/A

# 7.6.43 neighbor attribute-unchanged

## Command Purpose

Use this command to advertise unchanged BGP attributes to the specified neighbor.

Use the no parameter with this command to disable this function.

## Command Syntax

neighbor *NEIGHBORID* attribute-unchanged { as-path | next-hop | med }

no neighbor *NEIGHBORID* attribute-unchanged { as-path | next-hop | med }

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (X:X::X:X\|TAG) | - |

| | | |
|---|---|---|
| X:X::X:X | Specifies the address of the BGP neighbor in IPv6 format. | IPv6 Address |
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |
| as-path | AS path attribute | - |
| next-hop | Next hop attribute | - |
| med | Multi Exit Discriminator | - |

## Command Mode

Address Family Configuration

## Default

N/A

## Usage

N/A

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 10
Switch(config-router)# address-family ipv6
Switch(config-router-af)#  neighbor 23018::1 attribute-unchanged as-path med
```

## Related Commands

N/A

# 7.6.44 neighbor capability orf prefix-list

## Command Purpose

Use this command to advertise ORF capability to neighbors.

Use the no parameter with this command to disable this function.

## Command Syntax

neighbor *NEIGHBORID* capability orf prefix-list ( both | receive | send )

no neighbor *NEIGHBORID* capability orf prefix-list ( both | receive | send )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (X:X::X:X\|TAG) | - |
| X:X::X:X | Specifies the address of the BGP neighbor in IPv6 format. | IPv6 Address |
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |
| orf | Advertises ORF capability to its neighbors | - |
| both | Indicates that the local router can send ORF entries to its peer as well as receive ORF entries from its peer. | - |
| receive | Indicates that the local router is willing to receive ORF entries from its peer | - |
| send | Indicates that the local router is willing to send ORF entries to its peer | - |

### Command Mode

Address Family Configuration

### Default

N/A

### Usage

Outbound Route Filters (ORFs) send and receive capabilities to lessen the number of updates exchanged between neighbors. By filtering updates, this option minimizes generating and processing of updates.

The local router advertises the ORF capability in send mode and the remote router receives the ORF capability in receive mode applying the filter as outbound policy. The two routers exchange updates to maintain the ORF for each

### Examples

```
Switch# configure terminal
Switch(config)# router bgp 10
Switch(config-router)# address-family ipv6
Switch(config-router-af)# neighbor 1.1.1.1 capability orf prefix-list both
```

### Related Commands

N/A

## 7.6.45 neighbor default-originate

### Command Purpose

Use this command to allow a BGP local router to send the default route 0:0::0:0 to a neighbor for use as a default route.

Use the no parameter with this command to send no route as a default.

### Command Syntax

neighbor *NEIGHBORID* default-originate ( *ROUTEMAP* | )

no neighbor *NEIGHBORID* default-originate ( *ROUTEMAP* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (X:X::X:X\|TAG) | - |
| X:X::X:X | Specifies the address of the BGP neighbor in IPv6 format. | IPv6 Address |
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |
| ROUTEMAP | route-map WORD | - |
| route-map | The route-map to specify criteria to originate default routes | - |
| WORD | Route-map name | - |

## Command Mode

Address Family Configuration

## Default

N/A

## Usage

Every router should have a default route, it is used to send datas to the network which is not existent in local RIB. To set a default route on each router can make every router have a default route, or to create a default route and broadcast it to BGP peer by this command.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 10
Switch(config-router)# address-family ipv6
Switch(config-router-af)# neighbor 2018::1 default-originate route-map myroute
```

## Related Commands

N/A

# 7.6.46 neighbor description

## Command Purpose

Use this command to associate a description with a neighbor.

Use the no parameter with this command to remove the description.

## Command Syntax

neighbor *NEIGHBORID* description *LINE*

no neighbor *NEIGHBORID* description

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (X:X::X:X\|TAG) | - |
| X:X::X:X | Specifies the address of the BGP neighbor in IPv6 format. | IPv6 Address |
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |
| LINE | Text to describing the neighbor. | Up to 80 characters |

## Command Mode

Router Configuration

## Default

N/A

## Usage

None

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 10
Switch(config-router)# neighbor 2018::1 description Backup router for sales.
```

## Related Commands

N/A

# 7.6.47 neighbor distribute-list

## Command Purpose

Use this command to filter route update from a particular BGP neighbor.

Use the no parameter with this command to remove an entry.

## Command Syntax

neighbor *NEIGHBORID* distribute-list *WORD* ( in | out )

no neighbor *NEIGHBORID* distribute-list *WORD* ( in | out )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (X:X::X:X\|TAG) | - |
| X:X::X:X | Specifies the address of the BGP neighbor in IPv6 format. | IPv6 Address |
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |
| WORD | The name of IP access-list | Up to 20 characters |

| | | |
|---|---|---|
| in | Indicates that incoming advertised routes will be filtered. | - |
| out | Indicates that outgoing advertised routes will be filtered. | - |

## Command Mode

Address Family Configuration

## Default

N/A

## Usage

Use only one distribute-list per BGP neighbor.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 10
Switch(config-router)# address-family ipv6
Switch(config-router-af)# neighbor 2018::1 distribute-list mylist out
```

## Related Commands

N/A

# 7.6.48 neighbor ebgp-multihop

## Command Purpose

Use this command to accept and attempt BGP connections to external peers on indirectly connected networks.

Use the no parameter with this command to return to the default.

## Command Syntax

neighbor *NEIGHBORID* ebgp-multihop ( *COUNT* | )

no neighbor *NEIGHBORID* ebgp-multihop

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (X:X::X:X\|TAG) | - |
| X:X::X:X | Specifies the address of the BGP neighbor in IPv6 format. | IPv6 Address |
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |
| COUNT | Maximum hop count. If the maximum hop count is not set the hop count is 255. | 1-255 |

## Command Mode

Router Configuration

## Default

N/A

## Usage

Multihop is not established if the only route to the multihop peer is a default route. This avoids loop formation.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 10
Switch(config-router)# neighbor 2018::1 remote-as 20
Switch(config-router)# neighbor 2018::1 ebgp-multihop 5
```

## Related Commands

N/A

# 7.6.49 neighbor filter-list

## Command Purpose

Use this command to set up a BGP filter.

Use the no parameter with this command to disable this function.

## Command Syntax

neighbor *NEIGHBORID* filter-list *LISTNAME* ( in | out )

no neighbor *NEIGHBORID* filter-list *LISTNAME* ( in | out )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (X:X::X:X\|TAG) | - |
| X:X::X:X | Specifies the address of the BGP neighbor in IPv6 format. | IPv6 Address |
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to theneighbor peer-group and neighbor remote-as commands. When this parameter is usedwith a command, the command applies on all peers in the specified group. | Up to 20 characters |
| in | Indicates that incoming advertised routes will be filtered. | - |
| out | Indicates that outgoing advertised routes will be filtered. | - |
| LISTNAME | The name of an autonomous system path access list. | Up to 20 characters |

## Command Mode

Address Family Configuration

## Default

N/A

## Usage

This command specifies an access list filter on updates based on the BGP autonomous system paths. Each filter is an access list based on regular expressions.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 10
Switch(config-router)# address-family ipv6
Switch(config-router-af)# neighbor 2018::1 filter-list listname out
```

## Related Commands

N/A

# 7.6.50 neighbor maximum-prefix

## Command Purpose

Use this command to control the number of prefixes that can be received from a neighbor.

Use the no parameter with this command to disable this function.

## Command Syntax

neighbor *NEIGHBORID* maximum-prefix *MAXIMUM*

no neighbor *NEIGHBORID* maximum-prefix

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (X:X::X:X\|TAG) | - |
| X:X::X:X | Specifies the address of the BGP neighbor in IPv6 format. | IPv6 Address |

| | | |
|---|---|---|
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |
| MAXIMUM | MAXPREFIX (THRESHOLD\|)(warning-only\|) | - |
| MAXPREFIX | Specifies the maximum number of prefixes permitted. | 1-4294967295 |
| THRESHOLD | <1-100> Specifies the threshold value, 1 to 100 percent. | 1-100 |
| warning-only | Only gives a warning message when the limit is exceeded. | - |

## Command Mode

Address Family Configuration

## Default

N/A

## Usage

The neighbor maximum-prefix command allows the configuration of a specified number of prefixes that a BGP router is allowed to receive from a neighbor. When the warning-only option is not used, if any extra prefixes are received, the router ends the peering. A terminated peer, stays down until the clear ip bgp command is used.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 10
Switch(config-router)# address-family ipv6
Switch(config-router-af)# neighbor 2018::1 maximum-prefix 1244 warning-only
```

## Related Commands

N/A

# 7.6.51 neighbor next-hop-self

## Command Purpose

Use this command to configure the router as the next hop for a BGP-speaking neighbor or peer group.

Use the no parameter with this command to disable this feature.

## Command Syntax

neighbor *NEIGHBORID* next-hop-self

no neighbor *NEIGHBORID* next-hop-self

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (X:X::X:X\|TAG) | - |
| X:X::X:X | Specifies the address of the BGP neighbor in IPv6 format. | IPv6 Address |
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |

## Command Mode

Address Family Configuration

## Default

N/A

## Usage

This command allows a BGP router to change the nexthop information that is sent to the iBGP peer. The nexthop information is set to the IP address of the interface used to communicate with the neighbor.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 10
Switch(config-router)# address-family ipv6
Switch(config-router-af)# neighbor 10.10.0.72 next-hop-self
```

## Related Commands

N/A

# 7.6.52 neighbor override-capability

## Command Purpose

Use this command to override a capability negotiation result.

Use the no parameter with this command to disable this function

## Command Syntax

neighbor *NEIGHBORID* override-capability

no neighbor *NEIGHBORID* override-capability

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (X:X::X:X\|TAG) | - |
| X:X::X:X | Specifies the address of the BGP neighbor in IPv6 format. | IPv6 Address |

| | | |
|---|---|---|
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |

### Command Mode

Router Configuration

### Default

N/A

### Usage

None

### Examples

```
Switch# configure terminal
Switch(config)# router bgp 12
Switch(config-router)# neighbor 2018::1 override-capability
```

### Related Commands

N/A

## 7.6.53 neighbor passive

### Command Purpose

Use this command to set a BGP neighbor as passive.

Use the no parameter with this command to disable this function

## Command Syntax

( no ) neighbor *NEIGHBORID* passive

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (X:X::X:X\|TAG) | - |
| X:X::X:X | Specifies the address of the BGP neighbor in IPv6 format. | IPv6 Address |
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |

## Command Mode

Router Configuration

## Default

N/A

## Usage

N/A

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 12
Switch(config-router)# neighbor 2018::1 passive
```

## Related Commands

N/A

# 7.6.54 neighbor peer-group (adding a neighbor)

## Command Purpose

Use this command to add a neighbor to an existing peer-group.

Use the no parameter with this command to disable this function.

## Command Syntax

neighbor *IPADDRESS* peer-group *TAG*

no neighbor *IPADDRESS* peer-group

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IPV6_ADDR | X:X::X:X Specifies the address of the BGP neighbor in IPv6 format. X:X::X:X Specifies the address of the BGP neighbor in IPv6 format. TAG Name of the peer-group | IPv6 Address |
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |

## Command Mode

Router Configuration

## Default

N/A

## Usage

Use this command to Neighbors with the same update policies are grouped into peer groups. This facilitates the updates of various policies, such as, distribute and filter lists. The peer-group is then configured easily with any of the neighbor commands. Any changes made to the peer group affect all members.

To create a peer-group use the neighbor peer-group create command and then use this command to add neighbors to the group.

## Examples

This example shows a new peer-group group1 and the adding of a neighbor 2018::1 to the group:

```
Switch# configure terminal
Switch(config)# router bgp 10
Switch(config-router)# neighbor group1 peer-group
Switch(config-router)# neighbor 2018::1 peer-group group1
```

## Related Commands

N/A

# 7.6.55 neighbor peer-group (creating a peer-group)

## Command Purpose

Use this command to create a peer-group.

Use the no parameter with this command to disable this function

## Command Syntax

neighbor *TAG* peer-group

no neighbor *TAG* peer-group

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| TAG | Name of the peer-group | - |

## Command Mode

Router Configuration

## Default

N/A

## Usage

Neighbors with the same update policies are grouped into peer groups. This facilitates the updates of various policies, such as, distribute and filter lists. The peer-group is then configured easily with any of the neighbor commands. Any changes made to the peer group affect all members. Use this command to create a peer-group.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 10
Switch(config-router)# neighbor group1 peer-group
```

## Related Commands

N/A

# 7.6.56 neighbor prefix-list

## Command Purpose

Use this command to distribute BGP neighbor information as specified in a prefix list.

Use the no parameter with this command to remove an entry.

## Command Syntax

neighbor *NEIGHBORID* prefix-list *LISTNAME* ( in | out )

no neighbor *NEIGHBORID* prefix-list *LISTNAME* ( in | out )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (X:X::X:X\|TAG) | - |
| X:X::X:X | Specifies the address of the BGP neighbor in IPv6 format. | IPv6 Address |
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |
| LISTNAME | The number of an AS-path access list. | Up to 20 characters |
| in | Specifies that the access list applies to incoming advertisements. | - |
| out | Specifies that the access list applies to outgoing advertisements. | - |

## Command Mode

Address Family Configuration

## Default

N/A

## Usage

Use this command to specify a prefix list for filtering BGP advertisements. Filtering by prefix list matches the prefixes of routes with those listed in the prefix list. If there is a match, the route is used. An empty prefix list permits all prefixes. If a given prefix does not match any entries of a prefix list, the route is denied access. When multiple entries of a prefix list match a prefix, the entry with the smallest sequence number is considered to be a real match.

The router begins the search at the top of the prefix list, with the sequence number 1. Once a match or deny occurs, the router does not need to go through

the rest of the prefix list. For efficiency the most common matches or denies are listed at the top.

The neighbor distribute-list command is an alternative to the neighbor prefix-list command and only

one of them can be used for filtering to the same neighbor in any direction.

## Examples

```
Switch# configure terminal
Switch(config)# ip prefix-list list1 deny 30.0.0.0/24
Switch(config)# router bgp 12
Switch(config-router)# address-family ipv6
Switch(config-router-af)# neighbor 10.10.10.10 prefix-list list1 in
```

## Related Commands

ip prefix-list

# 7.6.57 neighbor remote-as

## Command Purpose

Use this command to configure an internal or external BGP (iBGP or eBGP) TCP session with another router.

## Command Syntax

neighbor *NEIGHBORID* remote-as *ASNUM*

no neighbor *NEIGHBORID* remote-as *ASNUM*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (X:X::X:X\|TAG) | - |
| X:X::X:X | Specifies the address of the BGP neighbor in IPv6 format. | IPv6 Address |

| | | |
|---|---|---|
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |
| ASNUM | Neighbor's autonomous system number | 1-4294967295 |

## Command Mode

Router Configuration

## Default

N/A

## Usage

This command is used to configure iBGP and eBGP sessions with other neighbors. A peer-group support of this command is configured only after creating a specific peer-group.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 11
Switch(config-router)# neighbor 2018::1 remote-as 345
```

## Related Commands

N/A

# 7.6.58 neighbor remove-private-AS

## Command Purpose

Use this command to remove the private Autonomous System (AS) number from outbound updates.

Use the no parameter with this command too revert to default.

## Command Syntax

neighbor *NEIGHBORID remove-private-AS*

no neighbor *NEIGHBORID remove-private-AS*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (X:X::X:X\|TAG) | - |
| X:X::X:X | Specifies the address of the BGP neighbor in IPv6 format. | IPv6 Address |
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |

## Command Mode

Address Family Configuration

## Default

Disabled

## Usage

The private AS numbers range from <64512-65535>. Private AS numbers are not advertised to the Internet. This command is used with external BGP peers only. The router removes the AS numbers only if the update includes private AS numbers. If the update includes both private and public AS numbers, the system treats it as an error.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 10
Switch(config-router)# address-family ipv6
Switch(config-router-af)# neighbor 2018::1 remove-private-AS
```

## Related Commands

N/A

# 7.6.59 neighbor route-reflector-client

## Command Purpose

Use this command to configure the router as a BGP route reflector and configure the specified neighbor as its client.

Use the no parameter with this command to indicate that the neighbor is not a client.

## Command Syntax

neighbor *NEIGHBORID* route-reflector-client

no neighbor *NEIGHBORID* route-reflector-client

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (X:X::X:X\|TAG) | - |
| X:X::X:X | Specifies the address of the BGP neighbor in IPv6 format. | IPv6 Address |
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |

## Command Mode

Address Family Configuration

## Default

N/A

## Usage

Route reflectors are a solution for the explosion of iBGP peering within an autonomous system. By route reflection the number of iBGP peers within an AS is reduced. Use the neighbor route-reflector-client command to configure the local router as the route reflector and specify neighbors as its client.

An AS can have more than one route reflector. One route reflector treats the other route reflector as another iBGP speaker.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 10
Switch(config-router)# address-family ipv6
Switch(config-router-af)# neighbor 2018::1 route-reflector-client
```

## Related Commands

N/A

# 7.6.60 neighbor send-community

## Command Purpose

Use this command to specify that a community attribute should be sent to a BGP neighbor.

Use the no parameter with this command to remove the entry. Use the extended and no parameters to remove extended communities. Specifying no other parameter means standard communities only.

## Command Syntax

neighbor *NEIGHBORID* send-community ( both | extended | standard | )

no neighbor *NEIGHBORID* send-community ( both | extended | standard | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (X:X::X:X\|TAG) | - |
| X:X::X:X | Specifies the address of the BGP neighbor in IPv6 format. | IPv6 Address |
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |
| both | Sends Standard and Extended Community attributes | - |
| extended | Sends Extended Community attributes | - |
| standard | Sends Standard Community attributes | - |

## Command Mode

Address Family Configuration

## Default

None

## Usage

By default ,community attributes are not sent to a neighbor.To use this command to enable this command.Route-map can be based on neighbor address, peer group name or AS path information.

## Examples

```
Switch# configure terminal
Switch(config)# bgp config-type standard
Switch(config)# router bgp 10
Switch(config-router)# address-family ipv6
Switch(config-router-af)# neighbor 2018::1 send-community extended
```

## Related Commands

N/A

# 7.6.61 neighbor shutdown

## Command Purpose

Use this command to disable a neighbor.

Use the no parameter with this command to re-enable the neighbor.

## Command Syntax

neighbor *NEIGHBORID* shutdown

no neighbor *NEIGHBORID* shutdown

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (X:X::X:X\|TAG) | - |
| A.B.C.D | Specifies the address of the BGP neighbor in IPv6 format. | IPv6 Address |
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |

## Command Mode

Router Configuration

## Default

N/A

## Usage

This command shuts down any active session for the specified neighbor and clears all related routing data.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 10
Switch(config-router)# neighbor 2018::1 shutdown
```

## Related Commands

N/A

# 7.6.62 neighbor soft-reconfiguration inbound

## Command Purpose

Use this command to configure to start storing updates.

Use the no parameter with this command to disable this function.

## Command Syntax

neighbor *NEIGHBORID* soft-reconfiguration inbound

bo neighbor *NEIGHBORID* soft-reconfiguration inbound

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (X:X::X:X\|TAG) | - |
| X:X::X:X | Specifies the address of the BGP neighbor in IPv4 format. | IPv6 Address |

| | | |
|---|---|---|
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |

## Command Mode

Router Configuration

Address Family Configuration

## Default

N/A

## Usage

Use this command to store updates for inbound soft reconfiguration. Soft-reconfiguration may be used in lieu of BGP route refresh capability. Using this command enables local storage of all the received routes and their attributes. This requires additional memory. When a soft reset (inbound) is done on this neighbor, the locally stored routes are reprocessed according to the inbound policy. The BGP neighbor connection is not affected.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 12
Switch(config-router)# address-family ipv6
Switch(config-router-af)# neighbor 2018::1 soft-reconfiguration inbound
```

## Related Commands

N/A

# 7.6.63 neighbor strict-capability-match

## Command Purpose

Use this command to close the BGP connection if capability value does not completely match to remote peer.

Use the no parameter with this command to disable this function

## Command Syntax

neighbor *NEIGHBORID* strict-capability-match

no neighbor *NEIGHBORID* strict-capability-match

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (X:X::X:X\|TAG) | - |
| X:X::X:X | Specifies the address of the BGP neighbor in IPv6 format. | IPv6 Address |
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |

## Command Mode

Router Configuration

## Default

N/A

## Usage

N/A

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 12
Switch(config-router)# address-family ipv6
Switch(config-router-af)# neighbor 2018::1 strict-capability-match
```

## Related Commands

N/A

# 7.6.64 neighbor timers

## Command Purpose

Use this command to set the timers for a specific BGP neighbor.

Use the no parameter with this command to clear the timers for a specific BGP neighbor

## Command Syntax

neighbor *NEIGHBORID* timers *KEEPALIVE HOLDTIME*

no neighbor *NEIGHBORID* timers

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (X:X::X:X\|TAG) | - |
| X:X::X:X | Specifies the address of the BGP neighbor in IPv6 format. | IPv6 Address |
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |

| | | |
|---|---|---|
| KEEPALIVE | Frequency (in seconds) at which a router sends keepalive messages to its neighbor. The default is 60 seconds. | 1-65535 |
| HOLDTIME | Interval (in seconds) after which, on not receiving a keepalive message, the router declares a neighbor dead. The default is 180 seconds. | 3-65535 |

## Command Mode

Router Configuration

## Default

N/A

## Usage

Keepalive messages are sent by a router to inform another router that the BGP connection between the two is still active. The keepalive interval is the period of time between each keepalive message sent by the router. The holdtime interval is the time the router waits to receive a keepalive message and if it does not receive a message for this period it declares the neighbor dead.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 12
Switch(config-router)# address-family ipv6
Switch(config-router-af)# neighbor 2018::1 timers 60 120
```

## Related Commands

N/A

# 7.6.65 neighbor unsuppress-map

## Command Purpose

Use this command to selectively leak more-specific routes to a particular neighbor.

## Command Syntax

neighbor *NEIGHBORID* unsuppress-map *WORD*

no neighbor *NEIGHBORID* unsuppress-map *WORD*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (X:X::X:X\|TAG) | - |
| X:X::X:X | Specifies the address of the BGP neighbor in IPv6 format. | IPv6 Address |
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |
| WORD | Name of route map | - |

## Command Mode

Address Family Configuration

## Default

N/A

## Usage

When the aggregate-address command is used with the summary-only option, the more-specific routes of the aggregate are suppressed to all neighbors. Use the

unsuppress-map command to selectively leak more-specific routes to a particular neighbor.

### Examples

```
Switch# configure terminal
Switch(config)#router bgp 10
Switch(config-router)address-family ipv6
Switch(config-router-af)neighbor 2018::1 unsuppress-map mymap
```

### Related Commands

N/A

## 7.6.66 neighbor update-source

### Command Purpose

Use this command to allow internal BGP sessions to use any operational interface for TCP connections.

Use the no parameter with this command to restore the interface assignment to the closest interface.

### Command Syntax

neighbor *NEIGHBORID* update-source *IFNAME*

no neighbor *NEIGHBORID* update-source

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (X:X::X:X\|TAG) | - |
| X:X::X:X | Specifies the address of the BGP neighbor in IPv6 format. | IPv6 Address |

| | | |
|---|---|---|
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |
| IFNAME | Specifies the loopback interface. | Support physical/aggregation/loopback/vlan/tunnel ports |

## Command Mode

Router Configuration

## Default

N/A

## Usage

Use this command in conjunction with any specified interface on the router. The loopback interface is the interface that is most commonly used with this command. The use of loopback interface eliminates a dependency and BGP does not have to rely on the availability of a particular interface for making TCP connections.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 10
Switch(config-router)# neighbor 2018::1 update-source eth-0-1
```

## Related Commands

N/A

# 7.6.67 neighbor weight

## Command Purpose

Use this command to set default weights for routes from this neighbor.

Use the no parameter with this command to remove a weight assignment.

## Command Syntax

neighbor *NEIGHBORID* weight *WEIGHT*

no neighbor *NEIGHBORID* weight

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (X:X::X:X\|TAG) | - |
| X:X::X:X | Specifies the address of the BGP neighbor in IPv6 format. | IPv6 Address |
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | Up to 20 characters |
| WEIGHT | Specifies the weight this command assigns to the route. | 0-65535 |

## Command Mode

Address Family Configuration

## Default

N/A

## Usage

Use this command to specify a weight value to all routes learned from a neighbor. The route with the highest weight gets preference when there are other routes on the network.

Unlike the local-preference attribute, the weight attribute is relevant only to the local router.

The weights assigned using the set weight command overrides the weights assigned using this command.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 12
Switch(config-router)address-family ipv6
Switch(config-router-af)# neighbor 2018::1 weight 60
```

## Related Commands

N/A

# 7.6.68 neighbor collide-established

## Command Purpose

Use this command to configure a BGP neighbor should be included into collision detection even its stats is established.

Use the no parameter with this command to disable this function.

## Command Syntax

neighbor *NEIGHBORID* collide-established

no neighbor *NEIGHBORID* collide-established

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (X:X::X:X\|TAG) | - |
| X:X::X:X | Specifies the address of the BGP neighbor in IPv6 format. | IPv6 Address |

## Command Mode

Router Configuration

## Default

In the default case, if a neighbor's state is established, it will not be included into collision detection.

## Usage

When building connection with BGP neighbors, devices on both sides may start TCP connections in the sasme time. There will be two TCP connections in this case. To avoid reduncancy, collision detection is required to shutdown the connection on the side whose router-id or BGP identifier is smaller.

In the default case, when a BGP neighbor is already established, it will not be included into collision detection, which may causes redundant connections. Therefore, this command should be used to include established neighbors into collision detection.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 100
Switch(config-router)# neighbor 3000::1 collide-establishe
```

## Related Commands

N/A

# 7.6.69 neighbor disallow-infinite-holdtime

## Command Purpose

Use this command to prohibit BGP neighbor to use infinite holdtime in OPEN message.

Use the no parameter with this command to allow BGP neighbor to use infinite holdtime.

## Command Syntax

neighbor *NEIGHBORID* disallow-infinite-holdtime

no neighbor *NEIGHBORID* disallow-infinite-holdtime

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (X:X::X:X\|TAG) | - |
| X:X::X:X | Specifies the address of the BGP neighbor in IPv6 format. | IPv6 Address |

## Command Mode

Router Configuration

## Default

In the default case, if a neighbor's state is established, it will not be included into collision detection.

## Usage

After building connection with BGP neighbors, devices need to send keepalive message to keep the connetion. The interval of sending keepalive message is the holdtime. When a neighbor negotiated the holdtime to be 0(infinite), the two neighbors on both sides will not need keepalive messages anymore.

Use this command to prohibit the neighbor to neigotiate the holdtime to infinite.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 100
Switch(config-router)# neighbor 3000::1 disallow-infinite-holdtime
```

## Related Commands

N/A

# 7.6.70 neighbor dont-capability-negotiate

## Command Purpose

Use this command to prohibit BGP neighbor to attach capability segement in OPEN message.

Use the no parameter with this command to allow BGP neighbor to attach capability segement.

## Command Syntax

neighbor *NEIGHBORID* dont-capability-negotiate

no neighbor *NEIGHBORID* dont-capability-negotiate

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (X:X::X:X\|TAG) | - |
| X:X::X:X | Specifies the address of the BGP neighbor in IPv6 format. | IPv6 Address |

## Command Mode

Router Configuration

## Default

In the default case, it is allowed for a BGP neighbor to attach the capability segment in OPEN messages.

## Usage

In the BGP open messages, neighbors can negotiate capabilities through the capability segment in open messages.

When the switch received an open message containing capability segment after enabled this function, it will send a notification message and shutdown the connetion with the neighbor.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 100
Switch(config-router)# neighbor 3000::1 dont-capability-negotiate
```

## Related Commands

N/A

# 7.6.71 neighbor enforce-multihop

## Command Purpose

Use this command to allow EBGP neighbor to build connection through multihop routes.

Use the no parameter with this command to prohibit EBGP neighbor to build connection through multihop routes, which means EBGP neighbor must be directly connected.

## Command Syntax

neighbor *NEIGHBORID* enforce-multihop

no neighbor *NEIGHBORID* enforce-multihop

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (X:X::X:X\|TAG) | - |
| X:X::X:X | Specifies the address of the BGP neighbor in IPv6 format. | IPv6 Address |

## Command Mode

Router Configuration

## Default

In the default case, it is only allowed to build connection with directly connected EBGP neighbor.

## Usage

Usually EBGP neighbor connection is built through direct connection. And the TTL of its TCP packets is 1. When build neighbor through non-direct connection like loopback interface, due to the limitation of TTL, the connection will fail. Then this command will be used to allow connection with EBGP neighbor through multihop routes.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 100
Switch(config-router)# neighbor 3000::1 enforce-multihop
```

## Related Commands

N/A

# 7.6.72 neighbor interface

## Command Purpose

Use this command to specify the interface for building connection with BGP neighbor.

Use the no parameter with this command to recover the default configuration.

## Command Syntax

neighbor *NEIGHBORID* interface *IFNAME*

no neighbor *NEIGHBORID* interface

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (X:X::X:X\|TAG) | - |
| X:X::X:X | Specifies the address of the BGP neighbor in IPv6 format. | IPv6 Address |
| IFNAME | Specifies the name of interface. | - |

## Command Mode

Router Configuration

## Default

In the default case, use the interface that has corresponding IP subnet with the IP address of the neighbor to build BGP connection.

## Usage

N/A

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 100
Switch(config-router)# neighbor 3000::1 interface eth-0-1
```

## Related Commands

N/A

# 7.6.73 neihgbor route-map

## Command Purpose

Use this command to apply route-map on BGP neighbor.

Use the no parameter with this command to cancel the route-map applied on neighbor.

## Command Syntax

neighbor *NEIGHBORID* route-map *RMAP* ( in | out )

no neighbor *NEIGHBORID* route-map *RMAP* ( in | out )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (X:X::X:X\|TAG) | - |

| | | |
|---|---|---|
| X:X::X:X | Specifies the address of the BGP neighbor in IPv6 format. | IPv6 Address |
| RMAP | Specifies the name of route-map to be applied. | - |

## Command Mode

Router Configuration

## Default

In the default case, no route-map is applied on incoming and outcoming routes of neighbors.

## Usage

Use this command to edit incoming or outcoming routes of neighbors through route-map.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 100
Switch(config-router)# neighbor 3000::1 route-map rmap1 in
```

## Related Commands

N/A

# 7.6.74 neighbor route-server-client

## Command Purpose

Use this command to set neighbor as route-server-client.

Use the no parameter with this command to unset neighbor as route-server-client.

## Command Syntax

neighbor *NEIGHBORID* route-server-client

no neighbor *NEIGHBORID* route-server-client

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (X:X::X:X\|TAG) | - |
| X:X::X:X | Specifies the address of the BGP neighbor in IPv6 format. | IPv6 Address |

## Command Mode

Router Configuration

## Default

N/A

## Usage

N/A

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 100
Switch(config-router)# neighbor 3000::1 route-server-client
```

## Related Commands

N/A

# 7.6.75 network

## Command Purpose

Use this command to specify the networks to be advertised by the BGP routing process. A unicast network address without a mask is accepted if it falls into the natural boundary of its class. A class-boundary mask is derived if the address matches its natural class-boundary.

Use the no form of this command to remove a network route entry.

## Command Syntax

network *X:X::X:X/M*

network *X:X::X:X/M* route-map *WORD*

no network *X:X::X:X/M*

no network *X:X::X:X/M* route-map *WORD*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| X:X::X:X/M | IPv6 prefix <network>, e.g., 2018:: | IPv6 address with mask length |
| WORD | Name of the route map | The length of route-map name should not greater than 20 and the first character should be 'a'-'z', 'A'-'Z' or '0'-'9'. |

## Command Mode

Address Family Configuration

## Default

N/A

## Usage

N/A

## Examples

The following example illustrates a address configured as a network route. The network prefix mask length of 64 will be internally derived, that is, 2018::/64:

```
Switch# configure terminal
Switch(config)#router bgp 1
Switch(config-router)address-family ipv6
Switch(config-router-af)#network 2018::/64

!
router bgp 1
no synchronization
network 2018::/64
!
```

### Related Commands

N/A

## 7.6.76 network synchronization

### Command Purpose

Use this command to ensure the exact same static network prefix, specified through any of the network commands, is local or has IGP reachability (in the NSM RIB) before being introduced into the BGP RIB.

Use the no parameter with this command to disable this function.

### Command Syntax

network synchronization

no network synchronization

### Command Mode

Router Configuration

Address Family Configuration

### Default

Network synchronization is disabled by default.

### Usage

N/A

### Examples

The following example enables IGP synchronization of BGP static network routes in the router configuration mode:

```
Switch# configure terminal
Switch(config)# router bgp 11
Switch(config-router)# network synchronization
```

### Related Commands

N/A

## 7.6.77 synchronization

### Command Purpose

Use this command to enable IGP synchronization of Internal BGP (iBGP) learned routes with the Internal Gateway Protocol (IGP) system in the router configuration mode or in the address-family configuration mode.

Use the no parameter with this command to disable this function.

### Command Syntax

synchronization

no synchronization

### Command Mode

Router Configuration

Address Family Configuration

### Default

IGP synchronization is disabled.

### Usage

Synchronization is used when a BGP router should not advertise routes learned from iBGP neighbors, unless those routes are also present in an IGP (for example, OSPF). Synchronization may be enabled when all the routers in an autonomous system do not speak BGP, and the autonomous system is a transit for other autonomous systems. The no synchronization command is used when BGP router can advertise routes learned from its iBGP neighbors without waiting for the IGP reachability to be present.

## Examples

The following example enables IGP synchronization of BGP static network routes in the IPv6-Unicast address family:

```
Switch# configure terminal
Switch(config)# router bgp 11
Switch(config)# address-family ipv6
Switch(config-af)# network synchronization
```

## Related Commands

N/A

# 7.6.78 redistribute

## Command Purpose

Use this command to redistribute routes from other sources to BGP routing-table.

Use the no parameter with this command to cancel the redistributing.

## Command Syntax

( no ) redistribute ( connected | isis | ospf | rip | static ) ( route-map *RMAP* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| RMAP | Specifies the name of route-map to be applied. | - |

## Command Mode

## Default

In the default case, no route is redistributed to BGP routing-table.

## Usage

N/A

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 100
Switch(config-router)# redistribute connected
```

## Related Commands

N/A

# 7.6.79 router bgp

## Command Purpose

Use this command to configure a BGP routing process.

Use the no parameter with this command to disable a routing process.

## Command Syntax

router bgp *ASN*

no router bgp *ASN*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ASN | Specifies the Autonomous System (AS) number | 1-4294967295 |

## Command Mode

Global Configuration

## Default

N/A

## Usage

The router bgp command enables a BGP routing process.

### Examples

```
Switch# configure terminal
Switch(config)# router bgp 12
Switch(config-router)#
```

### Related Commands

N/A

## 7.6.80 show debugging bgp

### Command Purpose

Use this command to display the BGP debugging option set.

### Command Syntax

show debugging bgp

### Command Mode

Privileged EXEC

### Default

N/A

### Usage

None

### Examples

```
Switch# show debugging bgp
```

### Related Commands

N/A

# 7.6.81 show bgp ipv6

## Command Purpose

Use this command to display BGP network information.

## Command Syntax

show bgp ipv6 ( *IPADDRESS* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IPADDRESS | X:X::X:X\|X:X::X:X/M Specifies the address and length. | IPv6 address with mask length |
| unicast | Specifies a IPv4 unicast address family. This is the default option. | - |

## Command Mode

Privileged EXEC

## Default

N/A

## Usage

N/A

## Examples

```
Switch# show bgp ipv6
```

## Related Commands

N/A

# 7.6.82 show bgp ipv6 community

## Command Purpose

Use this command to display routes matching the communities.

## Command Syntax

show bgp ( ipv6 ) community [ *AA:NN* | *local-AS* | no-advertise | no-export ] ( exact-match | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| local-AS | Do not send outside local AS (well-known community). | - |
| AA:NN | Specifies the valid value for the community number. This format represents the 32 bit communities value, where AS is the high order 16 bits and VAL is the low order 16 bits in digit format. | Support 2 bytes AS number and 2 bytes community ID |
| no-advertise | Do not advertise to any peer (well-known community). | - |
| no-export | Do not export to next AS (well-known community). | - |

## Command Mode

Privileged EXEC

## Default

N/A

## Usage

N/A

### Examples

```
Switch# show bgp ipv6 community
Switch# show bgp ipv6 community local-AS 100
```

### Related Commands

N/A

## 7.6.83 show bgp ipv6 community-list

### Command Purpose

Use this command to display routes that match the community-list.

### Command Syntax

show ip bgp community-list *LISTNAME* ( exact-match | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LISTNAME | Specifies the community list name. | Up to 20 characters |
| exact-match | Displays only routes that have exactly the same specified communities. | - |

### Command Mode

Privileged EXEC

### Default

N/A

### Usage

N/A

### Examples

```
Switch# show bgp ipv6 community-list mylist exact-match
Switch# show bgp ipv6 unicast community-list mylist
```

## Related Commands

N/A

# 7.6.84 show bgp ipv6 dampening

## Command Purpose

Use this command to display detailed information about dampening.

## Command Syntax

show bgp ipv6 dampening ( dampened-paths | flap-statistics | parameters )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| dampened-paths | Display paths suppressed due to dampening. | - |
| flap-statistics | Display flap statistics of routes. | - |
| parameters | Display details of configured dampening parameters. | - |

## Command Mode

Privileged EXEC

## Default

N/A

## Usage

N/A

## Examples

Enable bgp dampening to maintain dampened-path information in memory. The following is a sample output displaying all the dampening parameters:

```
Switch# show bgp ipv6 dampening parameters
```

## Related Commands

N/A

# 7.6.85 show bgp ipv6 filter-list

## Command Purpose

Use this command to display routes conforming to the filter-list.

## Command Syntax

show ip bgp filter-list *LISTNAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LISTNAME | Specifies the access list name. | Up to 20 characters |

## Command Mode

Privileged EXEC

## Default

N/A

## Usage

N/A

## Examples

```
Switch# show bgp ipv6 filter-list mylist
```

## Related Commands

N/A

## 7.6.86 show bgp ipv6 inconsistent-as

### Command Purpose

Use this command to display routes with inconsistent AS Paths.

### Command Syntax

show bgp ipv6 inconsistent-as

### Command Mode

Privileged EXEC

### Default

N/A

### Usage

N/A

### Examples

```
Switch# show bgp ipv6 inconsistent-as
```

### Related Commands

N/A

## 7.6.87 show bgp ipv6 neighbors

### Command Purpose

Use this command to display detailed information on TCP and BGP neighbor connections.

### Command Syntax

show bgp ipv6 neighbors ( *IPV6_ADDR* | )

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| IPV6_ADDR | X:X::X:X Specifies the IPv6 address. | IPv6 Address |

## Command Mode

Privileged EXEC

## Default

N/A

## Usage

N/A

## Examples

This is a sample output from the show bgp ipv6 neighbors command displaying information about the specified neighbor:

```
Switch# show bgp ipv6 neighbors
```

## Related Commands

N/A

# 7.6.88 show bgp ipv6 paths

## Command Purpose

Use this command to display BGP path information.

## Command Syntax

show bgp ipv6 paths

## Command Mode

Privileged EXEC

## Default

N/A

## Usage

N/A

## Examples

```
Switch# show bgp ipv6 paths
```

## Related Commands

N/A

# 7.6.89 show bgp ipv6 prefix-list

## Command Purpose

Use this command to display routes matching the prefix-list.

## Command Syntax

show bgp ipv6 prefix-list *LIST*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LIST | Specifies the name of the IPv6 prefix list. | Up to 40 characters |

## Command Mode

Privileged EXEC

## Default

N/A

## Usage

N/A

### Examples

```
Switch# show bgp ipv6 prefix-list mylist
```

### Related Commands

N/A

## 7.6.90 show bgp ipv6 quote-regexp

### Command Purpose

Use this command to display routes matching the AS path regular expression in quotes.

### Command Syntax

show bgp ipv6 quote-regexp *WORD*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| WORD | Specifies a regular-expression to match the BGP AS paths | Regular expression in quotes |

### Command Mode

Privileged EXEC

### Default

N/A

### Usage

N/A

### Examples

```
Switch# show bgp ipv6 quote-regexp "Switch"
```

## Related Commands

N/A

# 7.6.91 show bgp ipv6 regexp

## Command Purpose

Use this command to display routes matching the AS path regular expression.

## Command Syntax

show bgp ipv6 regexp *LINE*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LINE | Displays routes matching the AS path regular expression. | Regular expression |

## Command Mode

Privileged EXEC

## Default

N/A

## Usage

N/A

## Examples

```
Switch# show bgp ipv6 regexp myexpression
```

## Related Commands

N/A

## 7.6.92 show bgp ipv6 summary

### Command Purpose

Use this command to display a summary of BGP neighbor status.

### Command Syntax

show bgp ipv6 summary

### Command Mode

Privileged EXEC

### Default

N/A

### Usage

N/A

### Examples

This is a sample output from the show bgp ipv6 summary command displaying a summary of BGP neighbor status:

```
Switch# show bgp ipv6 summary
```

### Related Commands

N/A

## 7.6.93 timers

### Command Purpose

Use this command sets the BGP keepalive timer and holdtime timer values.

Use the no parameter with this command to reset timers to default value.

## Command Syntax

timers bgp *KEEPALIVE HOLDTIME*

no timers bgp

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| KEEPALIVE | <0-65535> The frequency with which the keepalive messages are sent to the neighbors.<br>The default value is 60 seconds. | 0-65535 |
| HOLDTIME | The interval after which the neighbor is considered dead if keepalive messages<br>are not received. The default holdtime value is 180 seconds. | 3-65535 |

## Command Mode

Router Configuration

## Default

N/A

## Usage

This command is used globally to set or unset the keepalive and holdtime values for all the neighbors.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 10
Switch(config-router)# timers bgp 40 120
```

## Related Commands

N/A

# 7.6.94 neighbor fall-over bfd

## Command Purpose

Use this command to establish IPV6 BFD session on BGP neighbour.

Use the no parameter with this command to delete BFD session on BGP neighbour.

## Command Syntax

neighbor *X:X::X:X* fall-over bfd ( multihop | )

no neighbor *X:X::X:X* fall-over bfd ( multihop | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| X:X::X:X | Specifies the address of the BGP neighbor in IPv6 format. | IPv6 Address in X:X::X:X format |
| multihop | establish multihop IPV6 BFD session | - |

## Command Mode

Router Configuration

## Default

N/A

## Usage

Enabling IPv6 bfd on bgp neighbor.

## Examples

```
Switch# configure terminal
Switch(config)# router bgp 12
Switch(config-router)# neighbor 2001:1::1 fall-over bfd
```

## Related Commands

None

# 8 Multicast Commands

## 8.1 IP Multicast-Routing Commands

### 8.1.1 ip multicast-routing

#### Command Purpose

Use this command to enable ip multicast routing.

To disable ip multicast routing, use the no form of this command.

#### Command Syntax

ip multicast-routing

no ip multicast-routing

#### Command Mode

Global Configuration

#### Default

Enable

#### Usage

None

#### Examples

This example shows how to enable ip multicast routing:

```
Switch# configure terminal
Switch(config)# ip multicast-routing
```

This example shows how to disable ip multicast routing:

```
Switch# configure terminal
Switch(config)# no ip multicast-routing
```

### Related Commands

None

## 8.1.2 ip multicast route-limit

### Command Purpose

Use this command to set the maximum number of the multicast routes.

To return it to default value, use the no form of this command.

### Command Syntax

ip multicast route-limit *ROUTE_NUMBER* ( *THRESHOLD_NUMBER* | )

no ip multicast route-limit

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ROUTE_NUMBER | Max number of multicast route entries | 1-2048 |
| THRESHOLD_NUMBER | Threshold at which to generate warning message | 1-2048 |

### Command Mode

Global Configuration

### Default

Default maximum number of the multicast routes is 2048.

Default threshold is same as the maximum number of multicast routes.

### Usage

None

## Examples

This example shows how to set the maximum number of the multicast routes to 512:

```
Switch# configure terminal
Switch(config)# ip multicast route-limit 512
```

This example shows how to return the maximum number of the multicast routes to default value:

```
Switch# configure terminal
Switch(config)# no ip multicast route-limit
```

## Related Commands

show ip mroute route-limit

# 8.1.3 show ip mroute

## Command Purpose

Use this command to display the ip multicast routing table information.

## Command Syntax

show ip mroute ( sparse | ) ( count | summary | )

show ip mroute *IP_ADDR* ( sparse | ) ( count | summary | )

show ip mroute route-limit

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| sparse | Show sparse multicast routes | - |
| count | Show number of multicast route entries | - |
| summary | Show abbreviated multicast route information | - |
| IP_ADDR | Show specify source or group address multicast route | IPv4 Address |
| route-limit | Show max route limit value | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to display multicast routing table:

```
Switch# show ip mroute
IP Multicast Routing Table
Flags: I - Immediate Stat, T - Timed Stat, F - Forwarder installed
Timers: Uptime/Stat Expiry
Interface State: Interface (TTL)
(10.0.1.20, 228.1.1.1), uptime 00:35:46, stat expires 00:02:19
Owner PIM-SM, Flags: TF
  Incoming interface: eth-0-1
  Outgoing interface list:
    eth-0-2 (1)
```

This example shows how to display multicast routing table summary information:

```
Switch# show ip mroute summary
IP Multicast Routing Table
Flags: I - Immediate Stat, T - Timed Stat, F - Forwarder installed
Timers: Uptime/Stat Expiry
Interface State: Interface (TTL)
(10.0.1.20, 228.1.1.1), 00:36:59/00:02:46, PIM-SM, Flags: TF
```

## Related Commands

ip multicast route-limit

ip mroute-rpf

## 8.1.4 show ip mvif

### Command Purpose

Use this command to display the multicast interface information.

### Command Syntax

show ip mvif ( *IFNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | Interface name | Support physical/aggregation/loopback/vlan/tunnel ports |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to display multicast interface information:

```
Switch# show ip mvif
Interface Vif   Owner                   TTL  Local           Remote
Uptime
          Idx   Module                      Address         Address
eth-0-1   0     PIM-SM                  1    10.0.1.1        0.0.0.0
00:42:56
eth-0-2   2     PIM-SM                  1    10.0.2.1        0.0.0.0
00:42:53
```

### Related Commands

ip pim sparse-mode

## 8.1.5 show ip multicast groups count

### Command Purpose

Use this command to display the multicast group count.

### Command Syntax

show ip multicast groups count

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to display multicast group number:

```
Switch# show ip multicast groups count
multicast group record count:  1
multicast source record count: 0
multicast total record count:  1
multicast max record count:    2048
```

### Related Commands

None

## 8.1.6 show resource mcast

### Command Purpose

Use this command to display multicast resource information.

### Command Syntax

show resource mcast

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to display multicast resource information:

```
Switch# show resource mcast
MCAST
Resource                          Used          Capability
============================================================
Mcast Entry                       0             1023
Mcast Normal Member               0             2046
Mcast Vlan Member                 0             1023
```

### Related Commands

None

## 8.1.7 clear ip mroute

### Command Purpose

Use this command to clear the multicast routing table information.

### Command Syntax

clear ip mroute ( * | *GRP_ADDR* ( *SRC_IP* ) | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| GRP_ADDR | Clear specify group address multicast route | IPv4 Address |
| SRC_ADDR | Clear specify source address multicast route | IPv4 Address |
| * | Clear all multicast routes | - |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to clear all multicast routing table information:

```
Switch# clear ip mroute *
```

### Related Commands

show ip mroute

## 8.2 IGMP Commands

### 8.2.1 ip igmp access-group

### Command Purpose

Use this command to apply an access-list to the igmp interface.

To remove this setting, use the no form of this command.

## Command Syntax

ip igmp access-group *LIST*

no ip igmp access-group

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LIST | The name of the ip access-list to be applied. The format of access-list should be ipv4. | Up to 40 characters |

## Command Mode

Interface Configuration

## Default

Access-group is not configured on any igmp interface by default.

## Usage

No matter the source ip or the destination ip in ACE should take effect respectively. If ACE's action is deny, then the packet should be ignored; otherwise, if it matches one whose action is permit, then it should be processed regularly.

## Examples

This example shows how to apply the access-list acl1 to the interface vlan1:

```
Switch# configure terminal
Switch(config)# interface vlan 1
Switch(config-if)# ip igmp access-group acl1
```

This example shows how to remove the access-list acl1 on the interface:

```
Switch# configure terminal
Switch(config)# interface vlan 1
Switch(config-if)# no ip igmp access-group
```

## Related Commands

show ip igmp interface

## 8.2.2 ip igmp immediate-leave group-list

### Command Purpose

Use this command to apply an access-list to configure which groups support immediate-leave per interface.

To remove this setting, use the no form of this command.

### Command Syntax

ip igmp immediate-leave group-list *LIST*

no ip igmp immediate-leave

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LIST | The name of the ip access-list to be applied. The format of access-list should be ipv4. | Up to 40 characters |

### Command Mode

Interface Configuration

### Default

Access-group is not configured on any igmp interface by default.

### Usage

No matter the source ip or the destination ip in ACE should take effect respectively. If ACE's action is deny, then the packet should be ignored; Otherwise if it matches one whose action is permit, then it should be processed regularly.

### Examples

This example shows how to apply an access-list to configure which groups support immediately-leave on interface vlan1:

```
Switch# configure terminal
Switch(config)# interface vlan 1
Switch(config-if)# ip igmp immediate-leave group-list acl1
```

This example shows how to remove the access-list acl1 on the interface:

```
Switch# configure terminal
Switch(config)# interface vlan 1
Switch(config-if)# no ip igmp immediate-leave group-list
```

### Related Commands

show ip igmp interface

## 8.2.3 ip igmp last-member-query-count

### Command Purpose

Use this command to set the value of last member query count.

To reset it to default value, use the no form of this command.

### Command Syntax

ip igmp last-member-query-count *COUNT*

no ip igmp last-member-query-count

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| COUNT | The value of last member query count | 2-7 |

### Command Mode

Interface Configuration

### Default

2

### Usage

None

### Examples

This example shows how to set the value of last member query count to 5:

```
Switch# configure terminal
Switch(config)# interface vlan 1
Switch(config-if)# ip igmp last-member-query-count 5
```

This example shows how to reset the value of last member query count to default value:

```
Switch# configure terminal
Switch(config)# interface vlan 1
Switch(config-if)# no ip igmp last-member-query-count
```

### Related Commands

show ip igmp interface

ip igmp last-member-query-interval

## 8.2.4 ip igmp last-member-query-interval

### Command Purpose

Use this command to set the value of last member query interval.

To reset it to default value, use the no form of this command.

### Command Syntax

ip igmp last-member-query-interval *INTERVAL*

no ip igmp last-member-query-interval

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INTERVAL | The last member query interval value(ms) | 1000-25500 ms |

### Command Mode

Interface Configuration

## Default

1000ms

## Usage

None

## Examples

This example shows how to set the last member query interval value to 10000ms:

```
Switch# configure terminal
Switch(config)# interface vlan 1
Switch(config-if)# ip igmp last-member-query-interval 10000
```

This example shows how to reset the last member query interval value to default value:

```
Switch# configure terminal
Switch(config)# interface vlan 1
Switch(config-if)# no ip igmp last-member-query-interval
```

## Related Commands

show ip igmp interface

ip igmp last-member-query-count

# 8.2.5 ip igmp limit

## Command Purpose

Use this command to set the max num of groups allowed.

To reset it to default value, use the no form of this command.

## Command Syntax

ip igmp limit *NUMBER* except *LIST*

no ip igmp limit

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NUMBER | The max num of groups | 1-2048 |
| LIST | Groups not to be counted | 访问控制列表名称 |

### Command Mode

Global Configuration

Interface Configuration

### Default

2048

### Usage

Max number of groups is 2048 by default,in global configuration mode, use this command to set number of groups for all ports, in interface configuration mode, use this command to set number of groups for one ports

### Examples

This example shows how to set the max num of groups allowed to 1000 globally:

```
Switch# configure terminal
Switch(config)# ip igmp limit 1000
```

This example shows how to reset the max num of groups to default value:

```
Switch# configure terminal
Switch(config)# no ip igmp limit
```

### Related Commands

show ip igmp interface

## 8.2.6 ip igmp mroute-proxy

### Command Purpose

Use this command to set the mroute-proxy port on this interface.

To remove it, use the no form of this command.

## Command Syntax

ip igmp mroute-proxy *IFNAME*

no ip igmp mroute-proxy

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | The interface name of the mroute-proxy port | Support physical/aggregation/loop back/vlan/tunnel ports |

## Command Mode

Interface Configuration

## Default

None

## Usage

This command is used to set the mroute-proxy port on the interface. Only one mroute-proxy port can be set on the interface. When set it again, the new setting will overwrite the old one.

## Examples

This example shows how to set the mroute-proxy port to eth-0-1 on this interface:

```
Switch# configure terminal
Switch(config)# interface vlan 1
Switch(config-if)# ip igmp mroute-proxy eth-0-1
```

This example shows how to remove the mroute-proxy port on this interface:

```
Switch# configure terminal
Switch(config)# interface vlan 1
Switch(config-if)# no ip igmp mroute-proxy
```

## Related Commands

ip igmp proxy-service

## 8.2.7 ip igmp proxy-service

### Command Purpose

Use this command to enable igmp mroute proxy service on the interface.

To disable it, use the no form of this command.

### Command Syntax

ip igmp proxy-service

no ip igmp proxy-service

### Command Mode

Interface Configuration

### Default

None

### Usage

This command is used with command ip igmp mroute-proxy and to set the upstream interface of the igmp group.

### Examples

This example shows how to enable igmp mroute proxy service on this interface:

```
Switch# configure terminal
Switch(config)# interface vlan 1
Switch(config-if)# ip igmp proxy-service
```

This example shows how to disable igmp mroute proxy service:

```
Switch# configure terminal
Switch(config)# interface vlan 1
Switch(config-if)# no ip igmp proxy-service
```

### Related Commands

ip igmp mroute-proxy

## 8.2.8 ip igmp querier-timeout

### Command Purpose

Use this command to set the igmp previous querier timeout value.

To reset it to default value, use the no form of this command.

### Command Syntax

ip igmp querier-timeout *INTERVAL*

no ip igmp querier-timeout

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INTERVAL | The igmp previous querier timeout value | 60-300 seconds |

### Command Mode

Interface Configuration

### Default

255s

### Usage

None

### Examples

This example shows how to set the igmp previous querier timeout value to 100 seconds:

```
Switch# configure terminal
Switch(config)# interface vlan 1
Switch(config-if)# ip igmp querier-timeout 100
```

This example shows how to reset the igmp previous querier timeout value to default value:

```
Switch# configure terminal
Switch(config)# interface vlan 1
Switch(config-if) #no ip igmp querier-timeout
```

### Related Commands

ip igmp query-interval

ip igmp query-max-response-time

## 8.2.9 ip igmp query-interval

### Command Purpose

Use this command to set the igmp query interval.

To reset it to default value, use the no form of this command.

### Command Syntax

ip igmp query-interval *INTERVAL*

no ip igmp query-interval

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INTERVAL | The value of igmp query interval | 2-18000 |

### Command Mode

Interface Configuration

### Default

125s

### Usage

None

## Examples

This example shows how to set the igmp query interval to 300 seconds:

```
Switch# configure terminal
Switch(config)# interface vlan 1
Switch(config-if)# ip igmp query-interval 300
```

This example shows how to reset the igmp query interval to default value:

```
Switch# configure terminal
Switch(config)# interface vlan 1
Switch(config-if)# no ip igmp query-interval
```

## Related Commands

ip igmp querier-timeout

ip igmp query-max-response-time

# 8.2.10 ip igmp query-max-response-time

## Command Purpose

Use this command to set the igmp query max response time.

To reset it to default value, use the no form of this command.

## Command Syntax

ip igmp query-max-response-time *INTERVAL*

no ip query-max-response-time

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INTERVAL | The igmp query max response time | 1-25 |

## Command Mode

Interface Configuration

## Default

10 seconds

## Usage

Query max response time must be less than igmp query interval.

## Examples

This example shows how to set the igmp query max response time to 20 seconds.:

```
Switch# configure terminal
Switch(config)# interface vlan 1
Switch(config-if)# ip igmp query-max-response-time 20
```

This example shows how to reset the igmp query max response time to default value:

```
Switch# configure terminal
Switch(config)# interface vlan 1
Switch(config-if)# no ip igmp query-max-response-time
```

## Related Commands

ip igmp querier-timeout

ip igmp query-interval

# 8.2.11 ip igmp robustness-variable

## Command Purpose

Use this command to set the igmp querier robustness variable value.

To reset it to default value, use the no form of this command.

## Command Syntax

ip igmp robustness-variable *VALUE*

no ip robustness-variable

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VALUE | The igmp querier robustness variable value | 2-7 |

### Command Mode

Interface Configuration

### Default

2

### Usage

None

### Examples

This example shows how to set the igmp querier robustness variable value to 6:

```
Switch# configure terminal
Switch(config)# interface vlan 1
Switch(config-if)# ip igmp robustness-variable 6
```

This example shows how to reset the igmp querier robustness variable value to default value:

```
Switch# configure terminal
Switch(config)# interface vlan 1
Switch(config-if)# no ip igmp robustness-variable
```

### Related Commands

show ip igmp interface

## 8.2.12 ip igmp version

### Command Purpose

Use this command to set the igmp version on interface.

To reset it to default value, use the no form of this command.

### Command Syntax

ip igmp version *VER*

no ip igmp version

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VER | The igmp version on the interface | 1-3 |

## Command Mode

Interface Configuration

## Default

2

## Usage

None

## Examples

This example shows how to set the igmp version 1 on the interface:

```
Switch# configure terminal
Switch(config)# interface vlan 1
Switch(config-if)# ip igmp version 1
```

This example shows how to reset the igmp version to default value:

```
Switch# configure terminal
Switch(config)# interface vlan 1
Switch(config-if)# no ip igmp version
```

## Related Commands

show ip igmp interface

# 8.2.13 ip igmp static-group

## Command Purpose

Use this command to configure the static multicast group on interface.

To delete static group, use the no form of this command.

## Command Syntax

ip igmp static-group *GRP_ADDR* ( source *SRC_ADDR* | )

no ip igmp static-group *GRP_ADDR* ( source *SRC_ADDR* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| GRP_ADDR | The multicast group address | IPv4 Address |
| SRC_ADDR | The multicast source address | IPv4 Address |

## Command Mode

Interface Configuration

## Default

None

## Usage

None

## Examples

This example shows how to configure the static IGMP group on interface:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ip igmp static-group 226.1.2.3
Switch(config-if)# ip igmp static-group 226.1.2.4 source 1.2.3.4
```

This example shows how to delete static igmp group on interface:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no ip igmp static-group 226.1.2.3
```

## Related Commands

show ip igmp groups

## 8.2.14 ip igmp ssm-map enable

### Command Purpose

Use this command to enable igmp ssm mapping.

To disable ssm mapping, use the no form of this command.

### Command Syntax

ip igmp ssm-map enable

no ip igmp ssm-map enable

### Command Mode

Global Configuration

### Default

Disable

### Usage

None

### Examples

This example shows how to enable igmp ssm mapping:

```
Switch# configure terminal
Switch(config)# ip igmp ssm-map enable
```

This example shows how to disable igmp ssm mapping:

```
Switch# configure terminal
Switch(config)# no ip igmp ssm-map enable
```

### Related Commands

None

## 8.2.15 ip igmp ssm-map static

### Command Purpose

Use this command to set igmp ssm mapping.

To cancel ssm mapping setting, use the no form of this command.

### Command Syntax

ip igmp ssm-map static *LIST SRC_ADDR*

no ip igmp ssm-map static *LIST SRC_ADDR*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LIST | Specify multicast group address range access list | Up to 40 characters |
| SRC_ADDR | Multicast source address | IPv4 Address |

### Command Mode

Global Configuration

### Default

None

### Usage

None

### Examples

This example shows how to set igmp ssm mapping:

```
Switch# configure terminal
Switch(config)# ip igmp ssm-map static ipacl 192.168.1.1
```

This example shows how to unset igmp ssm mapping:

```
Switch# configure terminal
Switch(config)# no ip igmp ssm-map static ipacl 192.168.1.1
```

### Related Commands

None

## 8.2.16 clear ip igmp

### Command Purpose

Use this command to clear igmp groups.

### Command Syntax

clear ip igmp group ( * | *GRP_ADDR* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| * | All multicast group address | - |
| GRP_ADDR | Multicast group address | IPv4 Address |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to clear igmp group all:

```
Switch# clear ip igmp
Switch# clear ip igmp group *
```

This example shows how to clear igmp specified group:

```
Switch# clear ip igmp group 228.1.1.1
```

### Related Commands

show ip igmp groups

## 8.2.17 clear ip igmp interface

### Command Purpose

Use this command to clear igmp groups on specified interface.

### Command Syntax

clear ip igmp interface *IFNAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | Interface name | Support physical/aggregation/loopback/vlan/tunnel ports |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to clear igmp group on specified interface:

```
Switch# clear ip igmp group interface eth-0-1
```

### Related Commands

show ip igmp groups

# 8.2.18 show ip igmp groups

## Command Purpose

Use this command to show the information about igmp groups.

## Command Syntax

show ip igmp groups *GRP_ADDR* ( detail | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| GRP_ADDR | Specify multicast group address | IPv4 Address |
| detail | Detailed Information | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to display the detail information about igmp groups:

```
Switch# show ip igmp groups detail
Interface:      eth-0-1
Group:          227.0.0.1
Uptime:         00:00:33
Group mode:     Exclude (Expires: 00:04:18)
Last reporter:  10.0.1.100
Source list is empty
```

## Related Commands

None

# 8.2.19 show ip igmp groups interface

## Command Purpose

Use this command to show the information about igmp groups on interface.

## Command Syntax

show ip igmp groups *IFNAME* ( *GRP_ADDR* | ) ( detail | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | Interface name | Support physical/aggregation/loopback/vlan/tunnel ports |
| GRP_ADDR | Specify multicast group address | IPv4 Address |
| detail | Detailed Information | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to display the information about igmp groups on interface eth-0-1:

```
Switch# show ip igmp groups eth-0-1
IGMP Connected Group Membership
Group Address    Interface            Uptime   Expires  Last Reporter
227.0.0.1        eth-0-1              00:01:11 00:04:16 10.0.1.100
```

### Related Commands

None

## 8.2.20 show ip igmp groups count

### Command Purpose

Use this command to show igmp group number.

### Command Syntax

show ip igmp groups ( *IFNAME* | ) count

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | Interface name | - |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to display the igmp group number on interface eth-0-1:

```
Switch# show ip igmp groups eth-0-1 count
Dynamic multicast groups count: 1
Static multicast groups count: 0
Total multicast groups count: 1
```

### Related Commands

None

# 8.2.21 show ip igmp interface

## Command Purpose

Use this command to show the information about igmp on interface.

## Command Syntax

show ip igmp interface ( *IFNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | Interface name | Support physical/aggregation/loopback/vlan/tunnel ports |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to display the information about igmp on interface eth-0-1:

```
Switch# show ip igmp interface eth-0-1
Interface eth-0-1 (Index 1)
 IGMP Enabled, Active, Querier, Version 2 (default)
 Internet address is 10.0.1.1
 IGMP interface limit is 8192
 IGMP interface has 1 group-record states
 IGMP activity: 97 joins, 0 leaves
 IGMP query interval is 125 seconds
 IGMP querier timeout is 255 seconds
 IGMP max query response time is 10 seconds
 Last member query response interval is 1000 milliseconds
 Group Membership interval is 260 seconds
```

```
Last memeber query count is 2
Robustness Variable is 2
```

### Related Commands

None

## 8.3 IGMP Snooping Commands

### 8.3.1 ip igmp snooping

#### Command Purpose

Use this command to enable igmp snooping.

To disable igmp snooping, use the no form of this command.

#### Command Syntax

ip igmp snooping ( vlan *VLAN_ID* | )

no ip igmp snooping ( vlan *VLAN_ID* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan ID | 1-4094 |

#### Command Mode

Global Configuration

#### Default

Enable

#### Usage

Igmp Snooping can be enabled globally and per vlan. By default, igmp snooping is enabled globally and per vlan.

## Examples

This example shows how to enable igmp snooping:

```
Switch# configure terminal
Switch(config)# ip igmp snooping
```

This example shows how to disable igmp snooping:

```
Switch# configure terminal
Switch(config)# no ip igmp snooping
```

This example shows how to enable igmp snooping on vlan 10:

```
Switch# configure terminal
Switch(config)# ip igmp snooping vlan 10
```

This example shows how to disable igmp snooping on vlan 10:

```
Switch# configure terminal
Switch(config)# no ip igmp snooping vlan 10
```

## Related Commands

show ip igmp snooping

# 8.3.2 ip igmp snooping fast-leave

## Command Purpose

Use this command to enable igmp snooping fast leave.

To disable it, use the no form of this command.

## Command Syntax

ip igmp snooping ( vlan *VLAN_ID* | ) fast-leave

no ip igmp snooping ( vlan *VLAN_ID* | ) fast-leave

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan ID | 1-4094 |

## Command Mode

Global Configuration

## Default

Disable

## Usage

This command will overide immediate-leave setting.

## Examples

This example shows how to enable igmp snooping fast-leave:

```
Switch# configure terminal
Switch(config)# ip igmp snooping fast-leave
```

This example shows how to disable igmp snooping fast-leave:

```
Switch# configure terminal
Switch(config)# no ip igmp snooping fast-leave
```

## Related Commands

show ip igmp snooping global

# 8.3.3 ip igmp snooping last-member-query-interval

## Command Purpose

Use this command to set the last member query interval of igmp snooping.

To reset it to default value, use the no form of this command.

## Command Syntax

ip igmp snooping ( vlan *VLAN_ID* | ) last-member-query-interval *INTERVAL*

no ip igmp snooping ( vlan *VLAN_ID* | ) last-member-query-interval

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan ID | 1-4094 |
| INTERVAL | The last member query interval | 1000-25500 ms |

### Command Mode

Global Configuration

### Default

1000 ms

### Usage

Igmp last member query interval can be configured per vlan. The default is 1000ms and the range is 1000-25500ms.

### Examples

This example shows how to set the last member query interval:

```
Switch# configure terminal
Switch(config)# ip igmp snooping last-member-query-interval 2000
```

This example shows how to reset the last member query interval to default value:

```
Switch# configure terminal
Switch(config)# no ip igmp snooping last-member-query-interval
```

### Related Commands

show ip igmp snooping

show ip igmp snooping vlan

## 8.3.4 ip igmp snooping global source-address

### Command Purpose

Use this command to set the global source address.

To reset it to default value, use the no form of this command.

### Command Syntax

ip igmp snooping global source-address *IP_ADDR*

no ip igmp snooping global source-address

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| IP_ADDR | The IPv4 address of source address | IPv4 Address |

## Command Mode

Global Configuration

## Default

0.0.0.0

## Usage

Will use global configured source-address if vlan is not configured，otherwise， use source-address config from vlan.

## Examples

This example shows how to set the global source address to 1.3.4.5:

```
Switch# configure terminal
Switch(config)# ip igmp snooping global source-address 1.3.4.5
```

This example shows how to reset the global source address to default value:

```
Switch# configure terminal
Switch(config)# no ip igmp snooping global source-address
```

## Related Commands

show ip igmp snooping querier

# 8.3.5 ip igmp snooping max-member-num

## Command Purpose

Use this command to set the max allowed member number.

To reset it to default value, use the no form of this command.

## Command Syntax

ip igmp snooping ( vlan *VLAN_ID* | ) max-member-num *NUMBER*

no ip igmp snooping ( vlan *VLAN_ID* | ) max-member-num

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan ID | 1-4094 |
| NUMBER | The max member number of igmp snooping | 1-8192 |

## Command Mode

Global Configuration

## Default

2048

## Usage

None

## Examples

This example shows how to set the max member number of igmp snooping to 1024:

```
Switch# configure terminal
Switch(config)# ip igmp snooping max-member-num 1024
```

This example shows how to reset the max member number to default value:

```
Switch# configure terminal
Switch(config)# no ip igmp snooping max-member-num
```

## Related Commands

show ip igmp snooping global

show ip igmp snooping vlan

## 8.3.6 ip igmp snooping query-interval

### Command Purpose

Use this command to set the igmp snooping query-interval.

To reset the query-interval to default value, use the no form of this command.

### Command Syntax

ip igmp snooping ( vlan *VLAN_ID* | ) query-interval interval

no ip igmp snooping ( vlan *VLAN_ID* | ) query-interval

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan ID | 1-4094 |
| INTERVAL | The query-interval of igmp snooping | 2-18000 seconds |

### Command Mode

Global Configuration

### Default

125s

### Usage

Query interval can not be less than igmp snooping query max response time.

### Examples

This example shows how to set the igmp snooping query interval to 64s:

```
Switch# configure terminal
Switch(config)# ip igmp snooping query-interval 64
```

This example shows how to reset the query-interval to default value:

```
Switch# configure terminal
Switch(config)# no ip igmp snooping query-interval
```

### Related Commands

show ip igmp snooping querier

show ip igmp snooping querier vlan

## 8.3.7 ip igmp snooping query-max-response-time

### Command Purpose

Use this command to set the igmp snooping query-interval.

To reset the query-interval to default value, use the no form of this command.

### Command Syntax

ip igmp snooping ( vlan *VLAN_ID* | ) query-max-response-time *TIME*

no ip igmp snooping ( vlan *VLAN_ID* | ) query-max-response-time

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan ID | 1-4094 |
| TIME | The query max response time in seconds | 1-25 |

### Command Mode

Global Configuration

### Default

10s

### Usage

Query interval can not be less than igmp snooping query max response time.

### Examples

This example shows how to set the igmp snooping query max response time to 15s:

```
Switch# configure terminal
Switch(config)# ip igmp snooping query-max-response-time 15
```

This example shows how to reset the query max response time to default value:

```
Switch# configure terminal
Switch(config)# no ip igmp snooping query-max-response-time
```

### Related Commands

show ip igmp snooping querier

show ip igmp snooping querier vlan

## 8.3.8 ip igmp snooping report-suppression

### Command Purpose

Use this command to enable report suppression.

To disable report suppression, use the no form of this command.

### Command Syntax

ip igmp snooping ( vlan *VLAN_ID* | ) report-suppression

no ip igmp snooping ( vlan *VLAN_ID* | ) report-suppression

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan ID | 1-4094 |

### Command Mode

Global Configuration

### Default

Enable

### Usage

Will not do report suppression when IGMP snooping works in v3 mode.

### Examples

This example shows how to enable the report suppression:

```
Switch# configure terminal
Switch(config)# ip igmp snooping report-suppression
```

This example shows how to disable report suppression:

```
Switch# configure terminal
Switch(config)# no ip igmp snooping report-suppression
```

### Related Commands

show ip igmp snooping

show ip igmp snooping vlan

## 8.3.9 ip igmp snooping version

### Command Purpose

Use this command to set igmp snooping version.

To reset it to default value, use the no form of this command.

### Command Syntax

ip igmp snooping ( vlan *VLAN_ID* | ) version *VER*

no ip igmp snooping ( vlan *VLAN_ID* | ) version

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan ID | 1-4094 |
| VER | Igmp snooping version | 1-3 |

### Command Mode

Global Configuration

### Default

2

### Usage

The default version is 2.

### Examples

This example shows how to set the igmp snooping version 1:

```
Switch# configure terminal
Switch(config)# ip igmp snooping version 1
```

### Related Commands

show ip igmp snooping

show ip igmp snooping vlan

## 8.3.10 ip igmp snooping discard-unknown

### Command Purpose

Use this command to set discard unknown multicast traffic.

To disable discard unknown, use the no form of this command.

### Command Syntax

ip igmp snooping ( vlan *VLAN_ID* | ) discard-unknown

no ip igmp snooping ( vlan *VLAN_ID* | ) discard-unknown

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan ID | 1-4094 |

### Command Mode

Global Configuration

### Default

Enabled by default, unknown multicast traffic will flood in vlan.

### Usage

None

## Examples

This example shows how to enable discard-unknown multicast traffic:

```
Switch# configure terminal
Switch(config)# ip igmp snooping discard-unknown
```

## Related Commands

show ip igmp snooping

show ip igmp snooping vlan

# 8.3.11 ip igmp snooping limit-mrouter-forward

## Command Purpose

Use this command to enable the report packet forward to mrouter port when l2 mcast group resource is full.

To disable forwading to mrouter when l2 mcast group resource is full, use the no form of this command.

## Command Syntax

ip igmp snooping ( vlan *VLAN_ID* | ) limit-mrouter-forward

no ip igmp snooping ( vlan *VLAN_ID* | ) limit-mrouter-forward

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan ID | 1-4094 |

## Command Mode

Global Configuration

## Default

When igmp snooping group is full, the other report will not forward to mrouter.

## Usage

None

## Examples

This example shows how to enable the report forward to mrouter when l2mc is full:

```
Switch# configure terminal
Switch(config)# ip igmp snooping limit-mrouter-forward
```

## Related Commands

show ip igmp snooping

show ip igmp snooping vlan

# 8.3.12 ip igmp snooping querier tcn

## Command Purpose

Use this command to set IGMP snooping querier TCN related parameters.To reset it to default value, use the no form of this command.

## Command Syntax

ip igmp snooping querier tcn ( enable | query-count *COUNT* | query-interval *INTERVAL* | query-max-response-time *TIME* )

no ip igmp snooping querier tcn ( enable | query-count | query-interval | query-max-response-time )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| enable | IGMP querier TCN query enable | - |
| COUNT | IGMP querier TCN query count, default is 2. | 1-10 |
| INTERVAL | IGMP querier TCN query interval, default is 10s. | 1-255 seconds |
| TIME | IGMP querier TCN query max response time, default is 5s | 1-9 seconds |

### Command Mode

Global Configuration

### Default

This feature is enabled by default, default query count is 2, default query interval is 10s, maximum response time is 5s

### Usage

None

### Examples

This example shows how to use ip igmp snooping querier tcn command:

```
Switch# configure terminal
Switch(config)# ip igmp snooping querier tcn query-count 2
```

### Related Commands

show ip igmp snooping querier

## 8.3.13 ip igmp snooping vlan access-group

### Command Purpose

Use this command to set igmp snooping access group on vlan.To remove this setting, use the no form of this command.

### Command Syntax

ip igmp snooping vlan *VLAN_ID* access-group *LIST*

no ip igmp snooping vlan *VLAN_ID* access-group

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan ID | 1-4094 |
| LIST | IP Named Standard Access list. | Up to 40 characters |

### Command Mode

Global Configuration

### Default

None

### Usage

None

### Examples

This example shows how to apply access-group on vlan 10:

```
Switch# configure terminal
Switch(config)# ip igmp snooping vlan 10 access-group acl
```

This example shows how to remove access-group from vlan 10:

```
Switch# configure terminal
Switch(config)# no ip igmp snooping vlan 10 access-group
```

### Related Commands

show ip igmp snooping vlan

## 8.3.14 ip igmp snooping vlan mrouter interface

### Command Purpose

Use this command to set igmp snooping mrouter interface on vlan.To remove this setting, use the no form of this command.

### Command Syntax

ip igmp snooping vlan *VLAN_ID* mrouter interface *IFNAME*

no ip igmp snooping vlan *VLAN_ID* mrouter interface *IFNAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan ID | 1-4094 |

| | | |
|---|---|---|
| IFNAME | Mrouter interface on this vlan | Support physical/aggregation ports |

## Command Mode

Global Configuration

## Default

None

## Usage

The specificed interface must have already joined the configured vlan.

## Examples

This example shows how to set eth-0-1 as mrouter interface on vlan 10:

```
Switch# configure terminal
Switch(config)# ip igmp snooping vlan 10 mrouter interface eth-0-1
```

This example shows how to unset eth-0-1 as mrouter interface on vlan 10:

```
Switch# configure terminal
Switch(config)# no ip igmp snooping vlan 10 mrouter interface eth-0-1
```

## Related Commands

show ip igmp snooping vlan

# 8.3.15 ip igmp snooping vlan mrouter-aging-interval

## Command Purpose

Use this command to set igmp snooping mrouter interface aging interval on vlan.To reset it to default value, use the no form of this command.

## Command Syntax

ip igmp snooping vlan *VLAN_ID* mrouter-aging-interval *INTERVAL*

no ip igmp snooping vlan *VLAN_ID* mrouter-aging-interval

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan ID | 1-4094 |
| INTERVAL | Dynamic mrouter interface aging interval on this vlan in seconds | 1-65535 seconds |

## Command Mode

Global Configuration

## Default

255s

## Usage

None

## Examples

This example shows how to set dynamic mrouter interface aging interval as 100 seconds on vlan 10:

```
Switch# configure terminal
Switch(config)# ip igmp snooping vlan 10 mrouter-aging-interval 100
```

This example shows how to reset dynamic mrouter interface aging interval as default on vlan 10:

```
Switch# configure terminal
Switch(config)# no ip igmp snooping vlan 10 mrouter-aging-interval
```

## Related Commands

show ip igmp snooping vlan

# 8.3.16 ip igmp snooping vlan mrouter-port-discard

## Command Purpose

Use this command to set igmp snooping mrouter port disacrd on vlan.To reset it to default value, use the no form of this command.

## Command Syntax

ip igmp snooping vlan *VLAN_ID* mrouter-port-discard

no ip igmp snooping vlan *VLAN_ID* mrouter-port-discard

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan ID | 1-4094 |

## Command Mode

Global Configuration

## Default

Disable

## Usage

None

## Examples

This example shows how to set the mrouter port discard on vlan 10:

```
Switch# configure terminal

Switch(config)# ip igmp snooping vlan 10 mrouter-port-discard
```

This example shows how to set the default mrouter port discard action on vlan 10:

```
Switch# configure terminal

Switch(config)# no ip igmp snooping vlan 10 mrouter-port-discard
```

## Related Commands

show ip igmp snooping vlan

# 8.3.17 ip igmp snooping vlan querier

## Command Purpose

Use this command to enable igmp snooping querier on vlan.To reset it to default, use the no form of this command.

## Command Syntax

ip igmp snooping vlan *VLAN_ID* querier

no ip igmp snooping vlan *VLAN_ID* querier

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan ID | 1-4094 |

## Command Mode

Global Configuration

## Default

Disable

## Usage

None

## Examples

This example shows how to enable querier on vlan 10:

```
Switch# configure terminal
Switch(config)# ip igmp snooping vlan 10 querier
```

This example shows how to disable querier on vlan 10:

```
Switch# configure terminal
Switch(config)# no ip igmp snooping vlan 10 querier
```

## Related Commands

show ip igmp snooping querier vlan

## 8.3.18 ip igmp snooping vlan querier address

### Command Purpose

Use this command to set igmp snooping querier address on vlan.To remove this setting, use the no form of this command.

### Command Syntax

ip igmp snooping vlan *VLAN_ID* querier address *IP_ADDR*

no ip igmp snooping vlan *VLAN_ID* querier address *IP_ADDR*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan ID | 1-4094 |
| IP_ADDR | The address of querier on this vlan | IPv4 Address |

### Command Mode

Global Configuration

### Default

None

### Usage

Will use global configured source-address if vlan is not configured，otherwise， use source-address config from vlan.

### Examples

This example shows how to set querier address on vlan 10:

```
Switch# configure terminal
Switch(config)# ip igmp snooping vlan 10 querier address 1.1.1.1
```

This example shows how to unset querier address on vlan 10:

```
Switch# configure terminal
Switch(config)# no ip igmp snooping vlan 10 querier address
```

### Related Commands

show ip igmp snooping querier vlan

## 8.3.19 ip igmp snooping vlan querier-timeout

### Command Purpose

Use this command to set igmp previous querier timeout interval on this vlan.To reset it to default, use the no form of this command.

### Command Syntax

ip igmp snooping vlan *VLAN_ID* querier-timeout *INTERVAL*

no ip igmp snooping vlan *VLAN_ID* querier-timeout

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan ID | 1-4094 |
| INTERVAL | The igmp previous querier timeout interval on this vlan in seconds | 60-300 seconds |

### Command Mode

Global Configuration

### Default

255s

### Usage

None

### Examples

This example shows how to set previous querier timeout interval as 100 seconds on vlan 10:

```
Switch# configure terminal
Switch(config)# ip igmp snooping vlan 10 querier-timeout 100
```

This example shows how to reset previous querier timeout interval on vlan 10:

```
Switch# configure terminal
Switch(config)# no ip igmp snooping vlan 10 querier-timeout
```

### Related Commands

show ip igmp snooping querier vlan

## 8.3.20 ip igmp snooping vlan static-group

### Command Purpose

Use this command to add static igmp group on this vlan.To remove this setting, use the no form of this command.

### Command Syntax

ip igmp snooping vlan *VLAN_ID* static-group *GRP_ADDR* ( source *SRC_ADDR* | ) interface *IFNAME*

no ip igmp snooping vlan *VLAN_ID* static-group *GRP_ADDR* ( source *SRC_ADDR* | ) interface *IFNAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan ID | 1-4094 |
| GRP_ADDR | The address of group configured on the specified interface. | IPv4 Address |
| SRC_ADDR | The address of source configured on the specified interface. | IPv4 Address |
| IFNAME | The interface configured as a member of specified group on this vlan | Support physical/aggregation ports |

### Command Mode

Global Configuration

### Default

None

## Usage

None

## Examples

This example shows how to add group 238.1.1.1 on interface eth-0-11 of vlan 10:

```
Switch# configure terminal
Switch(config)# ip igmp snooping vlan 10 static-group 238.1.1.1 interface eth-0-11
```

This example shows how to remove group 238.1.1.1 from interface eth-0-11 of vlan 10:

```
Switch# configure terminal
Switch(config)# no ip igmp snooping vlan 10 static-group 238.1.1.1 interface eth-0-11
```

## Related Commands

show ip igmp snooping group

# 8.3.21 ip igmp snooping vlan static-group remote-vtep

## Command Purpose

Use this command to add static igmp group with remote vtep on this vlan.To remove this setting, use the no form of this command.

## Command Syntax

ip igmp snooping vlan *VLAN_ID* static-group *GRP_ADDR* remote-vtep *VTEP_NUM*

no ip igmp snooping vlan *VLAN_ID* static-group *GRP_ADDR* remote-vtep *VTEP_NUM*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan ID | 1-4094 |
| GRP_ADDR | The address of group configured on the specified interface. | IPv4 Address |
| VTEP_NUM | Remote Vtep Number | 1-65535 |

## Command Mode

Global Configuration

## Default

None

## Usage

None

## Examples

This example shows how to add group 238.1.1.1 on remote-vtep 1:

```
Switch# configure terminal
Switch# vlan 10
Switch(config-vlan)# overlay enable
Switch(config-vlan)# exit
Switch(config)# overlay
Switch(config-overlay)# source 1.1.1.1
Switch(config-overlay)# remote-vtep 1 ip-address 2.2.2.2 type vxlan
Switch(config-overlay)# vlan 10 vni 10
Switch(config-overlay)# vlan 10 remote-vtep 1
Switch(config-vlan)# exit
Switch(config)# ip igmp snooping vlan 10 static-group 238.1.1.1 remote-vtep 1
```

This example shows how to remove group 238.1.1.1 from remote-vtep 1 of vlan 10:

```
Switch# configure terminal
Switch(config)# no ip igmp snooping vlan 10 static-group 238.1.1.1 remote-vtep 1
```

## Related Commands

show ip igmp snooping group

# 8.3.22 clear ip igmp snooping group

## Command Purpose

Use this command to clear all igmp snooping groups.

## Command Syntax

clear ip igmp snooping group ( * | *GRP_ADDR* )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| * | All multicast group address | - |
| GRP_ADDR | Multicast group address | IPv4 Address |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to clear igmp snooping group all:

```
Switch# clear ip igmp snooping group *
```

## Related Commands

None

# 8.3.23 clear ip igmp snooping vlan

## Command Purpose

Use this command to clear igmp snooping groups on vlan.

## Command Syntax

clear ip igmp snooping vlan *VLAN_ID*

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| VLAN_ID | Vlan ID | 1-4094 |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to clear igmp snooping group on vlan 10:

```
Switch# clear ip igmp snooping vlan 10
```

### Related Commands

None

## 8.3.24 clear ip igmp snooping mrouter vlan

### Command Purpose

Use this command to clear igmp snooping mrouter on vlan.

### Command Syntax

clear ip igmp snooping mrouter vlan *VLAN_ID*

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| VLAN_ID | VLAN ID | 1-4094 |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to clear igmp snooping mrouter on vlan 10:

```
Switch# clear ip igmp snooping mrouter vlan 10
```

### Related Commands

clear ip igmp snooping mrouter

## 8.3.25 clear ip igmp snooping mrouter

### Command Purpose

Use this command to clear igmp snooping mrouter.

### Command Syntax

clear ip igmp snooping mrouter

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to clear igmp snooping mrouter all:

```
Switch# clear ip igmp snooping mrouter
```

### Related Commands

clear ip igmp snooping mrouter vlan

## 8.3.26 show ip igmp snooping global

### Command Purpose

Use this command to show the global configurations of igmp snooping.

### Command Syntax

show ip igmp snooping global

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to display global configurations of igmp snooping:

```
Switch# show ip igmp snooping global
Global Igmp Snooping Configuration
------------------------------------------------
Igmp Snooping                           :Enabled
Igmp Snooping Fast-Leave                :Disabled
Igmp Snooping Version                   :2
Igmp Snooping Robustness Variable       :2
```

```
Igmp Snooping Max-Member-Number           :2048
Igmp Snooping Unknown Multicast Behavior  :Flood
Igmp Snooping Report-Suppression          :Enabled
```

### Related Commands

None

## 8.3.27 show ip igmp snooping groups

### Command Purpose

Use this command to show the igmp snooping groups.

### Command Syntax

show ip igmp snooping groups

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to display igmp snooping groups:

```
Switch# show ip igmp snooping groups
VLAN   Interface      Group-Address      Uptime     Expires-time
1      eth-0-1        227.0.0.1          00:03:44   00:04:18
```

### Related Commands

None

# 8.3.28 show ip igmp snooping groups vlan

## Command Purpose

Use this command to show the igmp snooping groups on vlan.

## Command Syntax

show ip igmp snooping groups vlan *VLAN_ID* ( *GRP_ADDR* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan ID | 1-4094 |
| GRP_ADDR | The address of group | IPv4 Address |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to display igmp snooping groups on vlan 1:

```
Switch# show ip igmp snooping groups vlan 1
IGMP Snooping groups for vlan1
Interface:      eth-0-1
Group:          227.0.0.1
Uptime:         00:05:24
Group mode:     Exclude (Expires: 00:04:20)
Last reporter:  10.0.1.100
Source list is empty
```

## Related Commands

None

# 8.3.29 show ip igmp snooping groups count

## Command Purpose

Use this command to show the igmp snooping groups number.

## Command Syntax

show ip igmp snooping groups ( vlan *VLAN_ID* | ) count

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan ID | 1-4094 |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to display igmp snooping groups number on vlan 1:

```
Switch# show ip igmp snooping groups vlan 1 count
Dynamic multicast groups count: 1
Static multicast groups count: 0
Total multicast groups count: 1
```

## Related Commands

None

# 8.3.30 show ip igmp snooping querier

## Command Purpose

Use this command to show the configurations of igmp snooping querier information.

## Command Syntax

show ip igmp snooping querier ( vlan *VLAN_ID* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan ID | 1-4094 |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to display the configurations of igmp snooping querier on vlan 1:

```
Switch# show ip igmp snooping querier vlan 1
Global Igmp Snooping Querier Configuration
-----------------------------------------------
Version                          :2
Last-Member-Query-Interval (msec) :1000
Last-Member-Query-Count           :2
Max-Query-Response-Time (sec)     :10
Query-Interval (sec)              :125
Global Source-Address             :0.0.0.0
TCN Query Count                   :2
TCN Query Interval (sec)          :10
TCN Query Max Respose Time (sec)  :5
Vlan 1:   IGMP snooping querier status
-----------------------------------------
```

```
Elected querier is : 0.0.0.0
-------------------------------------------
Admin state                         :Disabled
Admin version                       :2
Operational state                   :Non-Querier
Querier operational address         :0.0.0.0
Querier configure address           :N/A
Last-Member-Query-Interval (msec) :1000
Last-Member-Query-Count             :2
Max-Query-Response-Time (sec)       :10
Query-Interval (sec)                :125
Querier-Timeout (sec)               :255
```

### Related Commands

None

## 8.3.31 show ip igmp snooping mrouter

### Command Purpose

Use this command to show the information of igmp snooping mrouter port on vlan.

### Command Syntax

show ip igmp snooping mrouter ( vlan *VLAN_ID* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan ID | 1-4094 |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to display the information of igmp snooping mrouter port on vlan 1:

```
Switch# show ip igmp snooping mrouter vlan 1
Interface      Mode      Uptime     Expires-time
eth-0-11       static    -          -
```

### Related Commands

None

## 8.3.32 show ip igmp snooping vlan

### Command Purpose

Use this command to show the configurations of igmp snooping on vlan.

### Command Syntax

show ip igmp snooping ( vlan *VLAN_ID* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan ID | 1-4094 |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to display the configurations of igmp snooping on vlan 1:

```
Switch# show ip igmp snooping vlan 1
Global Igmp Snooping Configuration
------------------------------------------------
Igmp Snooping                              :Enabled
Igmp Snooping Fast-Leave                   :Disabled
Igmp Snooping Version                      :2
Igmp Snooping Robustness Variable          :2
Igmp Snooping Max-Member-Number            :2048
Igmp Snooping Unknown Multicast Behavior   :Flood
Igmp Snooping Report-Suppression           :Enabled
Vlan 1
-----------
Igmp Snooping                              :Enabled
Igmp Snooping Fast-Leave                   :Disabled
Igmp Snooping Report-Suppression           :Enabled
Igmp Snooping Version                      :2
Igmp Snooping Robustness Variable          :2
Igmp Snooping Max-Member-Number            :2048
Igmp Snooping Unknown Multicast Behavior   :Flood
Igmp Snooping Group Access-list            :N/A
Igmp Snooping Mrouter Port                 :
Igmp Snooping Mrouter Port Aging Interval(sec) :255
```

### Related Commands

None

## 8.3.33 show resource l2mcast

### Command Purpose

Use this command to display the resource usage of L2 mcast.

### Command Syntax

show resource l2mcast

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following is sample output from the show resource l2mcast command:

```
Switch# show resource l2mcast
L2MCAST
Resource                          Used          Capability
============================================================
L2 Mcast Entry                    0             2048
```

### Related Commands

None

## 8.4 PIM Commands

### 8.4.1 ip pim accept-register

### Command Purpose

Use this command to apply an access-list to limit the pim register message received by rp.

To remove this setting, use the no form of this command.

### Command Syntax

ip pim accept-register list *LIST*

no ip pim accept-register

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LIST | The name of the access-list to be applied. | Up to 40 characters |

### Command Mode

Global Configuration

### Default

None

### Usage

This feature is used to prevent the unauthorized user registered to the switch.

When enable this feature, the system will send back a register stop message when the unauthorized register message is received.

### Examples

This example shows how to apply the access-list acl1 to limit the pim register message received by rp:

```
Switch# configure terminal
Switch(config)# ip pim accept-register list acl1
```

This example shows how to remove the limits:

```
Switch# configure terminal
Switch(config)# no ip pim accept-register
```

### Related Commands

None

## 8.4.2 ip pim anycast-rp

### Command Purpose

Use this command to set anycast rendezvous-point.

To remove the configurations, use the no form of this command.

### Command Syntax

ip pim anycast-rp *ANYCAST_RP_ADDR ANYCAST_MEMBER_ADDR*

no ip pim anycast-rp *ANYCAST_RP_ADDR* ( *ANYCAST_MEMBER_ADDR* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ANYCAST_RP_ADDR | Anycast rp address | IPv4 Address |

| | | |
|---|---|---|
| ANYCAST_MEMBER_ADDR | Anycast member rp address | IPv4 Address |

## Command Mode

Global Configuration

## Default

None.

## Usage

Should configure every router in the network, and must configure same RP address.

## Examples

This example shows how to set anycast rendezvous-point:

```
Switch# configure terminal
Switch(config)# ip pim anycast-rp 10.10.10.1 10.10.10.11
```

This example shows how to remove the member in anycast rendezvous-point:

```
Switch# configure terminal
Switch(config)# no ip pim anycast-rp 10.10.10.1 10.10.10.11
```

## Related Commands

None

# 8.4.3 ip pim bsr-candidate

## Command Purpose

Use this command to configure the candidate bootstrap router (candidate BSR).

To remove the configurations, use the no form of this command.

## Command Syntax

ip pim bsr-candidate *IFNAME* ( *MASK_LEN* ( *PRIORITY* ) ( *INTERVAL* ) | )

no ip pim bsr-candidate

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | Interface name | Support physical/aggregation/loopback/vlan/tunnel ports |
| MASK_LEN | Hash mask length for RP selection | 0-32 |
| PRIORITY | Priority value for candidate bootstrap router | 0-255 |
| INTERVAL | Interval value for candidate bootstrap router | 1-107374177 |

## Command Mode

Global Configuration

## Default

None

## Usage

None

## Examples

This example shows how to configure the candidate BSR:

```
Switch# configure terminal
Switch(config)# ip pim bsr-candidate eth-0-1
```

This example shows how to cancel the candidate BSR configured:

```
Switch# configure terminal
Switch(config)# no ip pim bsr-candidate
```

## Related Commands

ip pim bsr-border

## 8.4.4 ip pim bsr-border

### Command Purpose

Use this command to configure the border of pim domain.

To remove the configurations of the border of pim domain, use the no form of this command.

### Command Syntax

ip pim bsr-border

no ip pim bsr-border

### Command Mode

Interface Configuration

### Default

Disable

### Usage

None

### Examples

This example shows how to configure the border of pim domain:

```
Switch# configure terminal
Switch(config-if)# ip pim bsr-border
```

This example shows how to remove the configurations of the border of pim domain:

```
Switch# configure terminal
Switch(config-if)# no ip pim bsr-border
```

### Related Commands

ip pim bsr-candidate

## 8.4.5 ip pim dr-priority

### Command Purpose

Use this command to configure DR priority.

To reset it to default value, use the no form of this command.

### Command Syntax

ip pim dr-priority *PRIORITY*

no ip pim dr-priority

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PRIORITY | The DR priority | 0-4294967294 |

### Command Mode

Interface Configuration

### Default

1

### Usage

When a hello message without DR priority is received, it will be regarded to have the max DR priority and to be elected as DR. When more than one router's hello messages do not have DR priority, the one which have the highest ip address will be elected as DR.

### Examples

This example shows how to set the pim router DR priority to 1000:

```
Switch# configure terminal
Switch(config-if)# ip pim dr-priority 1000
```

This example shows how tos reset the pim router DR priority to default value:

```
Switch# configure terminal
Switch(config-if)# no ip pim dr-priority
```

### Related Commands

None

## 8.4.6 ip pim exclude-genid

### Command Purpose

Use this command to exclude generation id option from pim hello packets on this interface.

To reset to the default setting, use the no form of this command.

### Command Syntax

ip pim exclude-genid

no ip pim exclude-genid

### Command Mode

Interface Configuration

### Default

Disable

### Usage

GenerationID is the ID of a PIM neighbour, it is carried in PIM hello message,the receiver device will record every received GenerationID in the hello packet and check if GenerationID has changed, if GenerationID changed, will consider neighbour state changed and restart state machine.

### Examples

This example shows how to exclude generation id option from pim hello packets on this interface:

```
Switch# configure terminal
Switch(config-if)# ip pim exclude-genid
```

This example shows how to reset the generation id option to the default setting:

```
Switch# configure terminal
Switch(config-if)# no ip pim exclude-genid
```

### Related Commands

None

## 8.4.7 ip pim hello-interval

### Command Purpose

Use this command to configure the interval for pim hello packets on this interface.

To reset to the default setting, use the no form of this command.

### Command Syntax

ip pim hello-interval *INTERVAL*

no ip pim hello-interval

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INTERVAL | The pim hello message interval in second | 1-18724 |

### Command Mode

Interface Configuration

### Default

30s

### Usage

None

### Examples

This example shows how to set the pim hello message interval to 100s:

```
Switch# configure terminal
Switch(config-if)# ip pim hello-interval 100
```

This example shows how to reset the pim hello message interval to default value:

```
Switch# configure terminal
Switch(config-if)# no ip pim hello-interval
```

### Related Commands

None

## 8.4.8 ip pim ignore-rp-set-priority

### Command Purpose

Use this command to ignore RP set priority value.

To not ignore the priority, use the no form of this command.

### Command Syntax

ip pim ignore-rp-set-priority

no ip pim ignore-rp-set-priority

### Command Mode

Global Configuration

### Default

Not ignore RP set priority value.

### Usage

None

### Examples

This example shows how to ignore RP set priority value:

```
Switch# configure terminal
Switch(config)# ip pim ignore-rp-set-priority
```

This example shows how to reset the configurations to default value:

```
Switch# configure terminal
Switch(config)# no ip pim ignore-rp-set-priority
```

### Related Commands

None

## 8.4.9 ip pim jp-timer

### Command Purpose

Use this command to set the join/prune timer value.

To reset the timer to default value, use the no form of this command.

### Command Syntax

ip pim jp-timer *TIMER*

no ip pim jp-timer

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| TIMER | The Join/Prune timer value (second) | 1-65535 |

### Command Mode

Global Configuration

### Default

60s

### Usage

None

## Examples

This example shows how to set the join/prune timer value to 100s:

```
Switch# configure terminal
Switch(config)# ip pim jp-timer 100
```

This example shows how to reset the join/prune timer value to default value:

```
Switch# configure terminal
Switch(config)# no ip pim jp-timer
```

## Related Commands

None

# 8.4.10 ip pim neighbor-filter

## Command Purpose

Use this command to add an access-list to filter the neighbor.

To remove this filter, use the no form of this command.

## Command Syntax

ip pim neighbor-filter *LIST*

no ip pim neighbor-filter

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LIST | The name of the access-list | Up to 40 characters |

## Command Mode

Interface Configuration

## Default

None

## Usage

Neighbours would send hello message to eachother to establish connections with other neighbour , you can use this command to filter which neighbour can be connected or not.

## Examples

This example shows how to establish neighbors based on access-list acl1:

```
Switch# configure terminal
Switch(config-if)# ip pim neighbor-filter acl1
```

This example shows how to cancel the filter:

```
Switch# configure terminal
Switch(config-if)# no ip pim  neighbor-filter
```

## Related Commands

None

# 8.4.11 ip pim register-rate-limit

## Command Purpose

Use this command to set the rate limit for pim registers.

To reset the rate limit to default value, use the no form of this command.

## Command Syntax

ip pim register-rate-limit *LIMIT*

no ip pim register-rate-limit

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LIMIT | The rate limit for pim registers send from dr to rp | 1-65535 |

## Command Mode

Global Configuration

### Default

By default, will not limit PIM register messages, if a limit is set, PIM register messages will be discard when pakcet reached by this limit.

### Usage

There is no rate limit for pim registers by default.

When the rate limit is configured, the exceed pim register message will be dropped on the rp.

### Examples

This example shows how to set the rate limit for pim registers to 100 per second.:

```
Switch# configure terminal
Switch(config)# ip pim register-rate-limit 100
```

This example shows how to cancel the rate limit:

```
Switch# configure terminal
Switch(config)# no ip pim register-rate-limit
```

### Related Commands

ip pim register-rp-reachability

ip pim register-source

ip pim register-suppression

## 8.4.12 ip pim register-source

### Command Purpose

Use this command to set the source address for pim register.

To reset the source address for pim register to default value, use the no form of this command.

### Command Syntax

ip pim register-source *IFNAME*

no ip pim register-source

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | The name of the interface. Use the address of this interface to be the source address for pim register | Support physical/aggregation/loopback/vlan/tunnel ports |

## Command Mode

Global Configuration

## Default

The source address for pim register is the interface ip of dr by default.

## Usage

None

## Examples

This example shows how to set the source address for pim register to the ip address of interface eth-0-1:

```
Switch# configure terminal
Switch(config)# ip pim register-source eth-0-1
```

This example shows how to reset the source address for pim register to default value:

```
Switch# configure terminal
Switch(config)# no ip pim register-source
```

## Related Commands

ip pim register-rate-limit

ip pim register-rp-reachability

ip pim register-suppression

## 8.4.13 ip pim register-rp-reachability

### Command Purpose

Use this command to enable rp reachability check for pim registers.

To disable this check, use the no form of this command.

### Command Syntax

ip pim register-rp-reachability

no ip pim register-rp-reachability

### Command Mode

Global Configuration

### Default

Disable.

### Usage

None

### Examples

This example shows how to enable rp reachability check for pim registers:

```
Switch# configure terminal
Switch(config)#ip pim register-rp-reachability
```

This example shows how to disable rp reachability check for pim registers:

```
Switch# configure terminal
Switch(config)#no ip pim register-rp-reachability
```

### Related Commands

ip pim register-rate-limit

ip pim register-source

ip pim register-suppression

## 8.4.14 ip pim register-suppression

### Command Purpose

Use this command to set the register suppression time.

To reset this time to default value, use the no form of this command.

### Command Syntax

ip pim register-suppression *TIME*

no ip pim register-suppression

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| TIME | The register suppression time in seconds | 11-18000 seconds |

### Command Mode

Global Configuration

### Default

60s

### Usage

None

### Examples

This example shows how to set the register suppression time to 100s:

```
Switch# configure terminal
Switch(config)# ip pim register-suppression 100
```

This example shows how to reset the register suppression time to default value:

```
Switch# configure terminal
Switch(config)# no ip pim register-suppression
```

### Related Commands

ip pim register-rate-limit

ip pim register-rp-reachability

ip pim register-source

## 8.4.15 ip pim rp-address

### Command Purpose

Use this command to set the pim rp (rendezvous point) address.

To remove this setting, use the no form of this command.

### Command Syntax

ip pim rp-address *IP_ADDR* ( *LIST* | override | )

no ip pim rp-address *IP_ADDR* ( *LIST* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IP_ADDR | The rp address | IPv4 Address |
| LIST | The name of an access-list | Up to 40 characters |
| override | Overrides dynamically learned RP mappings | - |

### Command Mode

Global Configuration

### Default

None

### Usage

None

## Examples

This example shows how to set the pim rp address to 1.1.1.1:

```
Switch# configure terminal
Switch(config)# ip pim rp-address 1.1.1.1
```

This example shows how to remove the rp address 1.1.1.1:

```
Switch# configure terminal
Switch(config)# no ip pim rp-address 1.1.1.1
```

## Related Commands

ip pim rp-candidate

ip pim rp-register-kat

# 8.4.16 ip pim rp-candidate

## Command Purpose

Use this command to set the candidate rp.

To remove the candidate rp, use the no form of this command.

## Command Syntax

ip pim rp-candidate *IFNAME* ( { priority *PRIORITY* | interval *INTERVAL* | group-list *LIST* } | )

no ip pim rp-candidate ( *IFNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | The name of the interface to be the candidate rp | Support physical/aggregation/loop back/vlan/tunnel ports |
| PRIORITY | The Candidate-RP priority | 0-255 |
| INTERVAL | The C-RP advertisement interval in seconds | 1-16383 seconds |
| LIST | Group ranges for this C-RP, only permit filters would be cared | Up to 40 characters |

## Command Mode

Global Configuration

## Default

None

## Usage

None

## Examples

This example shows how to set the interface eth-0-1 to be the candidate rp:

```
Switch# configure terminal
Switch(config)# ip pim rp-candidate eth-0-1
```

This example shows how to cancel the configured candidate rp:

```
Switch# configure terminal
Switch(config)# no ip pim rp-candidate eth-0-1
```

## Related Commands

ip pim rp-address

# 8.4.17 ip pim rp-register-kat

## Command Purpose

Use this command to set the keepalive timer (KAT) for (S,G) at RP from PIM registers.

To reset this timer to default value, use the no form of this command.

## Command Syntax

ip pim rp-register-kat *TIME*

no ip pim rp-register-kat

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| TIME | The KAT time in seconds | 1-65535 seconds |

## Command Mode

Global Configuration

## Default

None

## Usage

The register message send from dr will add an entry on rp. This entry will be aged when the keepalive timer expired which can be configured by this command.

## Examples

This example shows how to set the keepalive timer to 100s at RP from PIM registers:

```
Switch# configure terminal
Switch(config)# ip pim rp-register-kat 100
```

This example shows how to reset this timer to default value:

```
Switch# configure terminal
Switch(config)# no ip pim rp-register-kat
```

## Related Commands

ip pim rp-address

ip pim rp-candidate

# 8.4.18 ip pim spt-switch-threshold infinity

## Command Purpose

Use this command to set the spt switch threshold to infinity.

To cancel this setting, use the no form of this command.

## Command Syntax

ip pim spt-switch-threshold infinity ( group-list *LIST* | )

no ip pim spt-switch-threshold infinity ( group-list *LIST* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LIST | Group address access list | Up to 40 characters |

## Command Mode

Global Configuration

## Default

The DR will switch to spt immediately when received the first multicast packet by default.

## Usage

None

## Examples

This example shows how to set the spt switch threshold to infinity:

```
Switch# configure terminal
Switch(config)# ip pim spt-switch-threshold infinity
```

This example shows how to reset the spt-switch-threshold to default:

```
Switch# configure terminal
Switch(config)# no ip pim spt-switch-threshold infinity
```

## Related Commands

show ip pim sparse-mode spt-threshold

# 8.4.19 ip pim cisco-register-checksum

## Command Purpose

Use this command to calculate register checksum over whole packet (cisco compatibility).

To remove this setting, use the no form of this command.

## Command Syntax

ip pim cisco-register-checksum ( group-list *LIST* | )

no ip pim cisco-register-checksum ( group-list *LIST* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LIST | Group address access list | 不超过 40 个字符的字符串 |

## Command Mode

Global Configuration

## Default

The register checksum defined in RFC is used by default.

## Usage

The register checksum defined in RFC is used by default,if group-list is configured, only packets that verified can be sent in CISCO way.

## Examples

This example shows how to set to calculate register checksum over whole packet:

```
Switch# configure terminal
Switch(config)# ip pim cisco-register-checksum
```

This example shows how to remove this setting:

```
Switch# configure terminal
Switch(config)# no ip pim cisco-register-checksum
```

### Related Commands

None

## 8.4.20 ip pim sparse-mode

### Command Purpose

Use this command to enable pim sparse mode on the interface.

To disable pim sparse mode, use the no form of this command.

### Command Syntax

ip pim sparse-mode ( passive | )

no ip pim sparse-mode ( passive | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| passive | Pim passive mode (local members only) | - |

### Command Mode

Interface Configuration

### Default

Disable

### Usage

The pim hello message will not be sent out from the interface when the passive mode is configured.

### Examples

This example shows how to enable pim sparse mode on the interface:

```
Switch# configure terminal
Switch(config-if)# ip pim sparse-mode
```

This example shows how to disable pim sparse mode on the interface:

```
Switch# configure terminal
Switch(config-if)# no ip pim  sparse-mode
```

This example shows how to enable pim sparse mode passive on the interface:

```
Switch# configure terminal
Switch(config-if)# ip pim sparse-mode passive
```

### Related Commands

None

## 8.4.21 ip pim dense-mode

### Command Purpose

Use this command to enable pim dense mode on the interface.

To disable pim dense mode, use the no form of this command.

### Command Syntax

ip pim dense-mode ( passive | )

no ip pim dense -mode

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| passive | Pim passive mode (local members only) | - |

### Command Mode

Interface Configuration

### Default

Disable

### Usage

Pim spasre-mode and dense-mode can not take effect on the same interface. The pim hello message will not be sent out from the interface when the passive mode is configured.

## Examples

This example shows how to enable pim dense mode on the interface:

```
Switch# configure terminal
Switch(config-if)# ip pim dense-mode
```

This example shows how to disable pim dense mode on the interface:

```
Switch# configure terminal
Switch(config-if)# no ip pim  dense-mode
```

This example shows how to enable pim dense mode passive on the interface:

```
Switch# configure terminal
Switch(config-if)# ip pim dense-mode passive
```

## Related Commands

None

# 8.4.22 ip pim propagation-delay

## Command Purpose

Use this command to set propagation delay on its LAN.

To cancel this setting, use the no form of this command.

## Command Syntax

ip pim propagation-delay timer

no ip pim propagation-delay

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| timer | Propagation delay value | 100-5000 ms |

## Command Mode

Interface Configuration

## Default

1000ms

## Usage

If all routers on a LAN support the LAN Prune Delay option, then the PIM routers on that LAN will use the values received to adjust their J/P_Override_Interval on that interface and the interface is LAN Delay Enabled

## Examples

This example shows how to set propagation delay:

```
Switch# configure terminal
Switch(config-if)# ip pim propagation-delay 400
```

This example shows how to unset this setting:

```
Switch# configure terminal
Switch(config-if)# no ip pim propagation-delay
```

## Related Commands

None

# 8.4.23 ip pim state-refresh origination-interval

## Command Purpose

Use this command to set the interval of originator sending state refresh messages.

To cancel this setting, use the no form of this command.

## Command Syntax

ip pim state-refresh origination-interval *INTERVAL*

no ip pim state-refresh origination-interval

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INTERVAL | state-refresh origination-interval | 1-100 seconds |

## Command Mode

Interface Configuration

### Default

60s

### Usage

State Refresh Messages are generated periodically by the PIM-DM router directly connected to a source. This command can control the interval of two messages

### Examples

This example shows how to set state-refresh origination-interval:

```
Switch# configure terminal
Switch(config-if)# ip pim state-refresh origination-interval 50
```

This example shows how to unset this setting:

```
Switch# configure terminal
Switch(config-if)# no ip pim state-refresh origination-interval
```

### Related Commands

None

## 8.4.24 ip pim unicast-bsm

### Command Purpose

Use this command to enable sending and receiving of unicast BSM for backward compatibility.

To cancel this setting, use the no form of this command.

### Command Syntax

ip pim unicast-bsm

no ip pim unicast-bsm

### Command Mode

Interface Configuration

## Default

Disable

## Usage

Interface will send BSM message to the whole pim domain by default.

## Examples

This example shows how to enable sending and receiving of unicast BSM for backward compatibility:

```
Switch# configure terminal
Switch(config-if)# ip pim unicast-bsm
```

This example shows how to cancel this setting:

```
Switch# configure terminal
Switch(config-if)# no ip pim unicast-bsm
```

## Related Commands

None

# 8.4.25 ip pim ssm

## Command Purpose

Use this command to enable pim-ssm and set ssm group range.

To cancel this setting, use the no form of this command.

## Command Syntax

ip pim ssm ( default | range *LIST* )

no ip pim ssm

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| default | Use 232.0.0.0/8 group range for SSM | - |
| LIST | ACL for group range to be used for SSM | Up to 40 characters |

## Command Mode

Global Configuration

## Default

Disable

## Usage

None

## Examples

This example shows how to enable pim-ssm and set ssm group range to default:

```
Switch# configure terminal
Switch(config)# ip pim ssm default
```

This example shows how to cancel this setting:

```
Switch# configure terminal
Switch(config)# no ip pim ssm default
```

## Related Commands

None

# 8.4.26 ip pim graceful-restart

## Command Purpose

Use this command to enable pim graceful-restart and set the GR period time.

To disable pim graceful-restart or set default GR period time, use the no form of this command.

## Command Syntax

ip pim graceful-restart ( period *TIME* | )

no ip pim graceful-restart ( period *TIME* | )

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| TIME | Pim graceful-restart period time | 90-3600 seconds |

## Command Mode

Global Configuration

## Default

120 seconds

## Usage

The pim graceful-restart can be enabled in stacking system.

## Examples

This example shows how to enable pim graceful-restart:

```
Switch# configure terminal
Switch(config)# ip pim graceful-restart
```

This example shows how to disable pim graceful-restart:

```
Switch# configure terminal
Switch(config)# no ip pim graceful-restart
```

This example shows how to configure pim GR period for the interface:

```
Switch# configure terminal
Switch(config)# ip pim graceful-restart period 100
```

## Related Commands

None

# 8.4.27 show ip pim sparse-mode bsr-router

## Command Purpose

Use this command to show the information of bootstrap router.

## Command Syntax

show ip pim sparse-mode bsr-router

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to display the information of bootstrap router:

```
Switch# show ip pim sparse-mode bsr-router
PIMv2 bootstrap information
This system is the bootstrap router (BSR)
  BSR address: 12.0.9.2
  Uptime:      00:00:08, BSR Priority: 64, Hash mask length: 10
  Next bootstrap message in 00:00:04
  Role: Candidate BSR
  State: Elected BSR
  Candidate RP: 12.0.9.2(eth-0-9)
    Advertisement interval 60 seconds
    Next C-RP advertisement in 00:00:57
```

## Related Commands

None

# 8.4.28 show ip pim sparse-mode interface

## Command Purpose

Use this command to show the information of pim interface.

## Command Syntax

show ip pim sparse-mode interface ( detail | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| detail | Detailed interface information | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to display the information of pim interface:

```
Switch# show ip pim sparse-mode interface detail
eth-0-9 (vif 0):
  Address 12.0.9.1, DR 12.0.9.2
  Hello period 30 seconds, Next Hello in 26 seconds
  Triggered Hello period 5 seconds
  Neighbors:
   12.0.9.2
```

## Related Commands

None

# 8.4.29 show ip pim sparse-mode local-member

## Command Purpose

Use this command to show the pim local membership information.

## Command Syntax

show ip pim sparse-mode local-member ( *IFNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | Interface name | Support physical/aggregation/loopback/vlan/tunnel ports |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to display pim local membership information:

```
Switch# show ip pim sparse-mode local-members
PIM local membership information
eth-0-3:
  (*, 229.1.1.1) : Include
eth-0-9:
  (*, 228.1.1.1) : Include
```

## Related Commands

None

# 8.4.30 show ip pim sparse-mode mroute

## Command Purpose

Use this command to show the mroute information of pim sparse mode.

## Command Syntax

show ip pim sparse-mode mroute ( *SRC_ADDR* | *GRP_ADDR* | ) ( detail | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SRC_ADDR | Source address | IPv4 Address |
| GRP_ADDR | Group address | IPv4 Address |
| detail | Detailed interface information | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to display pim mroute information:

```
Switch# show ip pim sparse-mode mroute detail
IP Multicast Routing Table
(*,*,RP) Entries: 0
(*,G) Entries: 2
(S,G) Entries: 0
(S,G,rpt) Entries: 0
FCR Entries: 0
(*, 228.1.1.1) Uptime: 00:09:55
  RP: 0.0.0.0, RPF nbr: None, RPF idx: None
  Upstream:
   State: NOT JOINED, SPT Switch: Enabled, JT: off
  Downstream:
   eth-0-9:
     State: NO INFO, ET: off, PPT: off
     Assert State: NO INFO, AT: off
      Winner: 0.0.0.0, Metric: 4294967295, Pref: 4294967295, RPT bit: on
  Local Olist:
   eth-0-9
(*, 229.1.1.1) Uptime: 00:04:22
  RP: 12.0.9.2, RPF nbr: 12.0.9.2, RPF idx: eth-0-9
  Upstream:
```

```
 State: JOINED, SPT Switch: Enabled, JT Expiry: 40 secs
 Macro state: Join Desired,
Downstream:
 eth-0-3:
   State: NO INFO, ET: off, PPT: off
   Assert State: NO INFO, AT: off
    Winner: 0.0.0.0, Metric: 4294967295, Pref: 4294967295, RPT bit: on
   Macro state: Could Assert, Assert Track
Local Olist:
 eth-0-3
```

### Related Commands

None

## 8.4.31 show ip pim sparse-mode neighbor

### Command Purpose

Use this command to show the neighbor information of pim sparse mode.

### Command Syntax

show ip pim sparse-mode neighbor ( ( *IFNAME* ( address | ) ) | detail | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | Interface name | Support physical/aggregation/loopback/vlan/tunnel ports |
| address | Neighbor address | - |
| detail | Detailed interface information | - |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to display the neighbor information of pim sparse mode:

```
Switch# show ip pim sparse-mode neighbor
Neighbor          Interface          Uptime/Expires     Ver   DR
Address                                                       Priority/Mode
12.0.9.2          eth-0-9            00:18:18 /00:01:20 v2    1 / DR
```

### Related Commands

None

## 8.4.32 show ip pim sparse-mode rp mapping

### Command Purpose

Use this command to show group to rp mappings.

### Command Syntax

show ip pim sparse-mode rp mapping

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to display group to rp mappings:

```
Switch# show ip pim sparse-mode rp mapping
PIM group-to-RP mappings
Group(s): 224.0.0.0/4
  RP: 12.0.9.2
```

```
    Info source: 12.0.9.2, via bootstrap, priority 192
         Uptime: 00:22:56, expires: 00:01:34
```

### Related Commands

None

## 8.4.33 show ip pim sparse-mode rp-hash

### Command Purpose

Use this command to show the information of rp to be chosen based on group selected.

### Command Syntax

show ip pim sparse-mode rp-hash *GRP_ADDR*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| GRP_ADDR | Multicast group address | - |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to display the information of rp to be chosen based on group 224.0.0.10:

```
Switch# show ip pim sparse-mode rp-hash 224.0.0.10
    RP: 12.0.9.2
    Info source: 12.0.9.2, via bootstrap
```

### Related Commands

None

## 8.4.34 show ip pim sparse-mode spt-threshold

### Command Purpose

Use this command to show the rpt to spt threshold of pim sparse mode.

### Command Syntax

show ip pim sparse-mode spt-threshold

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to display the rpt to spt threshold of pim sparse mode:

```
Switch# show ip pim sparse-mode spt-threshold
PIM spare-mode immediately switches over to SPT upon receiving the first traffic
```

### Related Commands

None

## 8.4.35 show ip pim dense-mode interface

### Command Purpose

Use this command to show the interface information of pim sparse mode.

### Command Syntax

show ip pim dense-mode interface ( detail | )

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to display the interface information of pim dense mode:

```
Switch# show ip pim dense-mode interface
Address          Interface VIFIndex Ver/   Nbr
                                    Mode   Count
2.2.2.1          eth-0-2   0        v2/D   0
3.3.3.1          eth-0-3   2        v2/D   0
```

### Related Commands

None

## 8.4.36 show ip pim dense-mode mroute

### Command Purpose

Use this command to show the mroute information of pim dense mode.

## Command Syntax

show ip pim dense-mode mroute

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to display pim mroute information:

```
Switch# show ip pim dense-mode mroute
PIM-DM Multicast Routing Table
(2.2.2.2, 225.1.2.3)
  Source directly connected on eth-0-2
  State-Refresh Originator State: Originator
  Upstream IF: eth-0-2
    Upstream State: Forwarding
    Assert State: NoInfo
  Downstream IF List:
    eth-0-3, in 'olist':
      Downstream State: NoInfo
      Assert State: NoInfo
(2.2.2.2, 225.1.2.4)
  Source directly connected on eth-0-2
  State-Refresh Originator State: Originator
  Upstream IF: eth-0-2
    Upstream State: Forwarding
    Assert State: NoInfo
  Downstream IF List:
    eth-0-3, in 'olist':
      Downstream State: NoInfo
      Assert State: NoInfo
```

## Related Commands

None

# 8.4.37 show ip pim dense-mode neighbor

## Command Purpose

Use this command to show the neighbor information of pim dense mode.

## Command Syntax

show ip pim sparse-mode neighbor ( detail | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| detail | Detailed interface information | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to display the neighbor information of pim dense mode:

```
Switch# show ip pim dense-mode neighbor
Neighbor-Address Interface          Uptime/Expires    Ver
4.4.4.4          eth-0-9            03d19h16m/00:01:29 v2
3.3.3.2          agg3               03d19h17m/00:01:37 v2
```

## Related Commands

None

## 8.4.38 show ip pim dense-mode nexthop

### Command Purpose

Use this command to show the nexthop information of pim dense mode.

### Command Syntax

show ip pim sparse-mode nexthop

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to display the nexthop information of pim dense mode:

```
Switch# show ip pim dense-mode nexthop
Destination      Nexthop   Nexthop         Nexthop          Metric Pref
                 Num       Addr            Interface
1.1.1.2          0         -               -                -      -
```

### Related Commands

None

## 8.4.39 show ip pim dense-mode interface

### Command Purpose

Use this command to show the interface information of pim sparse mode.

### Command Syntax

show ip pim dense-mode interface ( detail | )

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to display the interface information of pim dense mode:

```
Switch# show ip pim dense-mode interface
Address          Interface VIFIndex Ver/   Nbr
                                    Mode   Count
2.2.2.1          eth-0-2   0        v2/D   0
3.3.3.1          eth-0-3   2        v2/D   0
```

### Related Commands

None

## 8.4.40 show ip pim dense-mode mroute

### Command Purpose

Use this command to show the mroute information of pim dense mode.

### Command Syntax

show ip pim dense-mode mroute

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to display pim mroute information:

```
Switch# show ip pim dense-mode mroute
PIM-DM Multicast Routing Table
(2.2.2.2, 225.1.2.3)
  Source directly connected on eth-0-2
  State-Refresh Originator State: Originator
  Upstream IF: eth-0-2
    Upstream State: Forwarding
    Assert State: NoInfo
  Downstream IF List:
    eth-0-3, in 'olist':
      Downstream State: NoInfo
      Assert State: NoInfo
(2.2.2.2, 225.1.2.4)
  Source directly connected on eth-0-2
  State-Refresh Originator State: Originator
  Upstream IF: eth-0-2
    Upstream State: Forwarding
    Assert State: NoInfo
  Downstream IF List:
    eth-0-3, in 'olist':
      Downstream State: NoInfo
      Assert State: NoInfo
```

## Related Commands

None

## 8.4.41 show ip pim sparse-mode nexthop-virtual-pair

### Command Purpose

Use this command to show the pim nexthop virtual address mapping information.

### Command Syntax

show ip pim sparse-mode nexthop-virtual-pair

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to display the pim nexthop virtual address mapping information:

```
Switch# show ip pim sparse-mode nexthop-virtual-pair
pim nexthop address  virtual address
10.1.1.2             20.1.1.2
```

### Related Commands

None

## 8.4.42 ip pim nexthop-address

### Command Purpose

Use this command to set the virtual address of the pim nexthop address.

To cancel this setting, use the no form of this command.

## Command Syntax

ip pim nexthop-address *NEXTHOP-ADDRESS* virtual-address *VIRTUAL-ADDRESS*

no ip pim nexthop-address ( *NEXTHOP-ADDRESS* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEXTHOP-ADDRESS | nexthop address | IPv4 Address |
| VIRTUAL-ADDRESS | virtual address | IPv4 Address |

## Command Mode

Global Configuration

## Default

None

## Usage

When PIM use virtual address to connect neighbour, Use this command to the virtual address of the pim nexthop address.

The command is used to enable the linkage between PIM-SM and VRRP,when enbale the command,it need to shutdown or no shutdown the port of ip pim bsr.

When enable the command, it also can be take effect if enable or disable the vrrp.

## Examples

This example shows how to set a nexthop address with virtual address:

```
Switch# configure terminal
Switch(config-if)# ip pim nexthop-address 10.1.1.2 virtual-address 20.1.1.2
```

This example shows how to unset this setting:

```
Switch# configure terminal
Switch(config-if)# no ip pim nexthop-address
```

### Related Commands

None

## 8.4.43 show ip pim graceful-restart

### Command Purpose

Use this command to show the pim graceful restart status.

### Command Syntax

show ip pim graceful-restart

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to display the pim graceful restart status:

```
Switch# show ip pim graceful-restart
PIMSM Graceful Restart enabled with GR period 300 seconds
  Current runnig status is Not at restart period
```

### Related Commands

None

# 8.5 MVR Commands

## 8.5.1 mvr

### Command Purpose

Use this command to enable MVR. To disable MVR, use the no form of this command.

### Command Syntax

mvr

no mvr

### Command Mode

Global Configuration

### Default

Disable

### Usage

Enable MVR in the Switch, must disable ip multicast-routing before enable MVR.

### Examples

This example shows how to enable MVR:

```
Switch# configure terminal
Switch(config)# no ip multicast-routing
Switch(config)# mvr
```

### Related Commands

show mvr

## 8.5.2 mvr vlan

### Command Purpose

Use this command to specify the MVR source vlan.To remove this setting, use the no form of this command.

### Command Syntax

mvr vlan vlan *VLAN_ID*

no mvr vlan

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan ID | 1-4094 |

### Command Mode

Global Configuration

### Default

None

### Usage

The related vlan interface should be created before the configuration of the MVR source vlan.

### Examples

This example shows how to configure source vlan of MVR. configure vlan 2 as source vlan of MVR:

```
Switch# configure terminal
Switch(config)# vlan database
Switch(config-vlan)# vlan 2
Switch(config)# interface vlan 2
Switch(config-if)# exit
Switch(config)# mvr vlan 2
```

### Related Commands

interface vlan

## 8.5.3 mvr group

### Command Purpose

Use this command to configure global group for MVR.To remove this setting, use the no form of this command.

### Command Syntax

mvr group *IP_ADDR* ( *COUNT* | )

no mvr group address ( *COUNT* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IP_ADDR | Multicast group address | IPv4 Address |
| COUNT | Count of contiguous groups | 1-64 |

### Command Mode

Global Configuration

### Default

None

### Usage

This command is used to create or delete a global static group.

### Examples

This example shows how to create global static group from 238.255.0.1 to 238.255.0.50:

```
Switch# configure terminal
Switch(config)# mvr group 238.255.0.1 50
```

### Related Commands

None

## 8.5.4 mvr source-address

### Command Purpose

Use this command to create or delete mvr source address.To remove this setting, use the no form of this command.

### Command Syntax

mvr source-address *IP_ADDR*

no mvr source-address

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IP_ADDR | Source ip address | IPv4 Address |

### Command Mode

Global Configuration

### Default

10.0.0.1

### Usage

None

### Examples

Create mvr source address:

```
Switch# configure terminal
Switch(config)# mvr source-address 192.168.11.1
```

Resume mvr source address as default IP address:

```
Switch# configure terminal
Switch(config)# no mvr source-address
```

### Related Commands

None

## 8.5.5 mvr type

### Command Purpose

Use this command to configure a switch-port as source port or receiver port.To remove this setting, use the no form of this command.

### Command Syntax

mvr type ( source | receiver vlan *VLAN_ID* )

no mvr type ( receiver vlan *VLAN_ID* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| source | MVR source port | - |
| receiver | MVR receiver port | - |
| VLAN_ID | MVR receiver vlan ID | 1-4094 |

### Command Mode

Interface Configuration

### Default

None

### Usage

Before configure the interface as source port or receiver port. make sure the source port belong to source vlan, and the receiver port must not belong to source vlan.

### Examples

Configure the eth-0-1 as source port, and configure the eth-0-2 as receiver port of vlan 2:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# mvr type source
Switch(config)# interface eth-0-2
Switch(config-if)# mvr type receiver vlan 2
```

### Related Commands

None

## 8.5.6 show mvr

### Command Purpose

Use this command to show mvr information.

### Command Syntax

show mvr

### Command Mode

Privileged EXEC

### Default

None

### Usage

Show mvr information.

### Examples

This example shows how to display MVR information:

```
Switch# show mvr
MVR Running: TRUE
MVR Multicast VLAN: 10
MVR Source-address: 1.1.1.1
MVR Max Multicast Groups: 512
MVR Hw Rt Limit: 511
MVR Current Multicast Groups: 0
```

### Related Commands

None

## 8.5.7 show mvr interface

### Command Purpose

Use this command to show mvr interface information.

### Command Syntax

show mvr interface

### Command Mode

Privileged EXEC

### Default

None

### Usage

Show mvr interface information.

### Examples

This example shows how to display MVR interface information:

```
Switch# show mvr interface
Port        Type          VLAN    Status
eth-0-2     source        10      ACTIVE
eth-0-1     receiver      11      ACTIVE
```

### Related Commands

None

# 8.5.8 show mvr group

## Command Purpose

Use this command to show mvr group learned from receiver port.

## Command Syntax

show mvr group vlan *VLAN_ID* ( *GRP_ADDR* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | MVR receiver vlan ID | 1-4094 |
| GRP_ADDR | Multicast group address | IPv4 Address |

## Command Mode

Privileged EXEC

## Default

None

## Usage

Show mvr group information learned from receiver port

## Examples

This example shows how to display mvr group learned from receiver port:

```
Switch# show mvr groups
VLAN    Interface       Group-Address       Uptime      Expires-time
11      eth-0-1         227.0.0.1           00:25:51    00:04:19
```

## Related Commands

None

## 8.5.9 show mvr group static

### Command Purpose

Use this command to show mvr global static groups.

### Command Syntax

show mvr group static global

### Command Mode

Privileged EXEC

### Default

None

### Usage

Show mvr static configured group information.

### Examples

This example shows how to display mvr global static groups:

```
Switch# show mvr groups static global
MVR Static Global Group:
227.0.0.1
227.0.0.2
227.0.0.3
227.0.0.4
227.0.0.5
227.0.0.6
227.0.0.7
227.0.0.8
227.0.0.9
227.0.0.10
```

### Related Commands

None

## 8.5.10 show resource mvr

### Command Purpose

Use this command to display the resource usage of MVR.

### Command Syntax

show resource mvr

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to display the resource usage of MVR:

```
Switch# show resource mvr
MVR
Resource                          Used          Capability
================================================================
MVR Entry                         0             511
MVR Member                        0             1022
```

### Related Commands

None

# 9 IPv6 Multicast Commands

## 9.1 IPv6 Multicast-Routing Commands

### 9.1.1 ipv6 multicast-routing

#### Command Purpose

Use this command to enable ipv6 multicast routing.

To disable ipv6 multicast routing, use the no form of this command.

#### Command Syntax

ipv6 multicast-routing

no ipv6 multicast-routing

#### Command Mode

Global Configuration

#### Default

Enable

#### Usage

None

#### Examples

This example shows how to enable ipv6 multicast routing:

```
Switch# configure terminal
Switch(config)# ipv6 multicast-routing
```

This example shows how to disable ipv6 multicast routing:

```
Switch# configure terminal
Switch(config)# no ipv6 multicast-routing
```

### Related Commands

None

## 9.1.2 ipv6 multicast route-limit

### Command Purpose

Use this command to set the maximum number of the multicast routes.

To reset it to default value, use the no form of this command.

### Command Syntax

ipv6 multicast route-limit *LIMIT* ( *THRESHOLD* | )

no ipv6 multicast route-limit

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LIMIT | Max number of multicast route entries | 1-2048 |
| THRESHOLD | Threshold at which to generate warning message | 1-2048 |

### Command Mode

Global Configuration

### Default

Default maximum number of the multicast routes should be 2048.

Default threshold should be same as the maximum number of multicast routes.

### Usage

None

## Examples

This example shows how to set the maximum number of the multicast routes to 512:

```
Switch# configure terminal
Switch(config)# ipv6 multicast route-limit 512
```

This example shows how to reset the maximum number of the multicast routes to default value:

```
Switch# configure terminal
Switch(config)# no ipv6 multicast route-limit
```

## Related Commands

show ipv6 mroute route-limit

# 9.1.3 show ipv6 mroute

## Command Purpose

Use this command to display the ipv6 multicast routing table information.

## Command Syntax

show ipv6 mroute ( sparse | ) ( count | summary | )

show ipv6 mroute *IPV6_ADDR* ( sparse | ) ( count | summary | )

show ipv6 mroute route-limit

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| sparse | Show sparse multicast routes | - |
| count | Show number of multicast route entries | - |
| summary | Show abbreviated multicast route information | - |
| IPV6_ADDR | Show specify source or group address multicast route | IPv6 address |
| route-limit | Show max route limit value | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to display multicast routing table:

```
Switch# show ipv6 mroute
IPv6 Multicast Routing Table
Flags: I - Immediate Stat, T - Timed Stat, F - Forwarder installed
Timers: Uptime/Stat Expiry
Interface State: Interface
2001:1::1234, ff0e::1234:5678
uptime 00:00:02, stat expires 00:03:28
Owner PIM-SMv6, Flags: TF
  Incoming interface: eth-0-1
  Outgoing interface list:
    Register
    eth-0-2
```

This example shows how to display multicast routing table summary information:

```
Switch# show ipv6 mroute summary
IPv6 Multicast Routing Table
Flags: I - Immediate Stat, T - Timed Stat, F - Forwarder installed
Timers: Uptime/Stat Expiry
Interface State: Interface
2001:1::1234, ff0e::1234:5678
    00:01:04/00:02:26, PIM-SMv6, Flags: TF
```

## Related Commands

ipv6 multicast route-limit

ipv6 mroute-rpf

## 9.1.4 show ipv6 mif

### Command Purpose

Use this command to display the multicast interface information.

### Command Syntax

show ipv6 mif ( *IFNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | Interface name | Support physical/aggregation/loopback/vlan/tunnel ports |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to display multicast interface information:

```
Switch# show ipv6 mif
Interface    Mif    Owner                Uptime
             Idx    Module
eth-0-1      0      PIM-SMv6             00:00:05
Register     1      PIM-SMv6             00:00:05
```

### Related Commands

ipv6 pim sparse-mode

## 9.1.5 show ipv6 multicast groups count

### Command Purpose

Use this command to display the multicast group count.

### Command Syntax

show ipv6 multicast groups count

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to display multicast group number:

```
Switch# show ipv6 multicast groups count
multicast group record count:  1
multicast source record count: 0
multicast total record count:  1
multicast max record count:    2048
```

### Related Commands

None

## 9.1.6 show resource mcast6

### Command Purpose

Use this command to display ipv6 multicast resource information.

## Command Syntax

show resource mcast6

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to display ipv6 multicast resource information:

```
Switch# show resource mcast6
MCAST
Resource                          Used          Capability
================================================================
Mcast Entry                       0             224
Mcast Member                      0             1792
```

## Related Commands

None

# 9.1.7 clear ipv6 mroute

## Command Purpose

Use this command to clear the ipv6 multicast routing table information.

## Command Syntax

clear ipv6 mroute ( * | *GRP_IPV6_ADDR* ( *SRC_IPV6_ADDR* ) | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| GRP_IPV6_ADDR | Clear specify group address multicast route | IPv6 address |
| SRC_IPV6_ADDR | Clear specify source address multicast route | IPv6 address |
| * | Clear all multicast routes | - |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to clear all ipv6 multicast routing table information:

```
Switch# clear ipv6 mroute *
```

### Related Commands

show ipv6 mroute

## 9.2 MLD Commands

### 9.2.1 ipv6 mld access-group

### Command Purpose

Use this command to apply an access-list to the mld interface.

To remove this setting, use the no form of this command.

## Command Syntax

ipv6 mld access-group *LISTNAME*

no ipv6 mld access-group

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LISTNAME | The name of the ipv6 access-list to be applied. The format of access-list should be ipv6. | A string with 1-20 characters |

## Command Mode

Interface Configuration

## Default

Access-group is not configured on any mld interface by default.

## Usage

No matter the source ipv6 prefix or the destination ipv6 prefix in ACE should take effect respectively. If ACE's action is deny, then the packet will be ignored; Otherwise if it matches one whose action is permit, then it will be processed regularly.

## Examples

This example shows how to apply the access-list acl1 to the interface vlan1:

```
Switch# configure terminal
Switch(config)# interface vlan 1
Switch(config-if)# ipv6 mld access-group acl1
```

This example shows how to remove the access-list acl1 on the interface:

```
Switch# configure terminal
Switch(config)# interface vlan 1
Switch(config-if)# no ipv6 mld access-group
```

## Related Commands

show ipv6 mld interface

## 9.2.2 ipv6 mld immediate-leave group-list

### Command Purpose

Use this command to apply an access-list to configure which groups support immediately-leave per interface.

To remove this setting, use the no form of this command.

### Command Syntax

ipv6 mld immediate-leave group-list *LISTNAME*

no ipv6 mld immediate-leave

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LISTNAME | The name of the ipv6 access-list to be applied. The format of access-list should be ipv6. | - |

### Command Mode

Interface Configuration

### Default

Access-group is not configured on any mld interface by default.

### Usage

No matter the source ipv6 prefix or the destination ipv6 prefix in ACE should be take effect respectively. If ACE's action is denied, then the packet should be ignored; Otherwise if it matches one whose action is permit, then it should be processed regularly.

### Examples

This example shows how to apply an access-list to configure which groups support immediately-leave on interface vlan1:

```
Switch# configure terminal
Switch(config)# interface vlan 1
Switch(config-if)# ipv6 mld immediate-leave group-list acl1
```

This example shows how to remove the access-list acl1 on the interface:

```
Switch# configure terminal
Switch(config)# interface vlan 1
Switch(config-if)# no ipv6 mld immediate-leave group-list
```

### Related Commands

show ipv6 mld interface

## 9.2.3 ipv6 mld last-member-query-count

### Command Purpose

Use this command to set the value of last member query count.

To return it to default value, use the no form of this command.

### Command Syntax

ipv6 mld last-member-query-count *COUNT*

no ipv6 mld last-member-query-count

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| COUNT | The value of last member query count, range is 2 to 7 | 2-7 |

### Command Mode

Interface Configuration

### Default

2

### Usage

None

## Examples

This example shows how to set the value of last member query count to 5:

```
Switch# configure terminal
Switch(config)# interface vlan 1
Switch(config-if)# ipv6 mld last-member-query-count 5
```

This example shows how to return the value of last member query count to default value:

```
Switch# configure terminal
Switch(config)# interface vlan 1
Switch(config-if)# no ipv6 mld last-member-query-count
```

## Related Commands

show ipv6 mld interface

ipv6 mld last-member-query-interval

# 9.2.4 ipv6 mld last-member-query-interval

## Command Purpose

Use this command to set the value of last member query interval.

To reset it to default value, use the no form of this command.

## Command Syntax

ipv6 mld last-member-query-interval *INTERVAL*

no ipv6 mld last-member-query-interval

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INTERVAL | The last member query interval value(ms) | 1000-25500 |

## Command Mode

Interface Configuration

## Default

1000

## Usage

None

## Examples

This example shows how to set the last member query interval value to 10000ms:

```
Switch# configure terminal
Switch(config)# ipv6 mld snooping last-member-query-interval 2000
```

This example shows how to reset the last member query interval value to default value:

```
Switch# configure terminal
Switch(config)# no ipv6 mld snooping last-member-query-interval
```

## Related Commands

show ipv6 mld interface

ipv6 mld last-member-query-count

# 9.2.5 ipv6 mld limit

## Command Purpose

Use this command to set the max num of groups allowed.

To reset it to default value, use the no form of this command.

## Command Syntax

ipv6 mld limit *NUMBER* ( except *LISTNAME* | )

no ipv6 mld limit

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NUMBER | The max num of groups, range is 1 to 4096 | 1-4096 |

| | | |
|---|---|---|
| LISTNAME | Groups not to be counted | A string with 1-20 characters |

## Command Mode

Global Configuration

Interface Configuration

## Default

4096

## Usage

Max number of groups is 4096 by default,in global configuration mode, use this command to set number of groups for all ports, in interface configuration mode, use this command to set number of groups for one ports

## Examples

This example shows how to set the max num of groups allowed to 1000 globally:

```
Switch# configure terminal
Switch(config)# ipv6 mld limit 1000
```

This example shows how to reset the max num of groups to default value:

```
Switch# configure terminal
Switch(config)# no ipv6 mld limit
```

## Related Commands

show ipv6 mld interface

# 9.2.6 ipv6 mld mroute-proxy

## Command Purpose

Use this command to set the mroute-proxy port on this interface.

To remove it, use the no form of this command.

## Command Syntax

ipv6 mld mroute-proxy *IFNAME*

no ipv6 mld mroute-proxy *IFNAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | The interface name of the mroute-proxy port | Support physical/aggregation/loopback/vlan/tunnel ports |

## Command Mode

Interface Configuration

## Default

None

## Usage

This command is used to set the mroute-proxy port on the interface. Only one mroute-proxy port can be set on the interface. When set it again, the new setting will overwrite the old one.

## Examples

This example shows how to set the mroute-proxy port to eth-0-1 on this interface:

```
Switch# configure terminal
Switch(config)# interface vlan 1
Switch(config-if)# ipv6 mld mroute-proxy eth-0-1
```

This example shows how to remove the mroute-proxy port on this interface:

```
Switch# configure terminal
Switch(config)# interface vlan 1
Switch(config-if)# no ipv6 mld mroute-proxy
```

## Related Commands

ipv6 mld proxy-service

## 9.2.7 ipv6 mld proxy-service

### Command Purpose

Use this command to enable mld mroute proxy service on the interface.

To disable it, use the no form of this command.

### Command Syntax

ipv6 mld proxy-service

no ipv6 mld proxy-service

### Command Mode

Interface Configuration

### Default

None

### Usage

This command is used with command ipv6 mld mroute-proxy and to set the upstream interface of the mld group.

### Examples

This example shows how to enable mld mroute proxy service on this interface:

```
Switch# configure terminal
Switch(config)# interface vlan 1
Switch(config-if)# ipv6 mld proxy-service
```

This example shows how to disable mld mroute proxy service:

```
Switch# configure terminal
Switch(config)# interface vlan 1
Switch(config-if)# no ipv6 mld proxy-service
```

### Related Commands

ipv6 mld mroute-proxy

## 9.2.8 ipv6 mld querier-timeout

### Command Purpose

Use this command to set the mld previous querier timeout value.

To reset it to default value, use the no form of this command.

### Command Syntax

ipv6 mld querier-timeout *INTERVAL*

no ipv6 mld querier-timeout

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INTERVAL | The mld previous querier timeout value, range is 60 to 300s. | 60-300 |

### Command Mode

Interface Configuration

### Default

255s

### Usage

None

### Examples

This example shows how to set the mld previous querier timeout value to 100 seconds:

```
Switch# configure terminal
Switch(config)# interface vlan 1
Switch(config-if)# ipv6 mld querier-timeout 100
```

This example shows how to reset the mld previous querier timeout value to default value:

```
Switch# configure terminal
Switch(config)# interface vlan 1
Switch(config-if)# no ipv6 mld querier-timeout
```

### Related Commands

ipv6 mld query-interval

ipv6 mld query-max-response-time

## 9.2.9 ipv6 mld query-interval

### Command Purpose

Use this command to set the mld query interval.

To reset it to default value, use the no form of this command.

### Command Syntax

ipv6 mld query-interval *INTERVAL*

no ipv6 mld query-interval

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INTERVAL | The value of mld query interval, range is 2 to 18000s. | 2-18000 |

### Command Mode

Interface Configuration

### Default

125s

### Usage

None

## Examples

This example shows how to set the mld query interval to 300 seconds:

```
Switch# configure terminal
Switch(config)# interface vlan 1
Switch(config-if)# ipv6 mld query-interval 300
```

This example shows how to return the mld query interval to default value:

```
Switch# configure terminal
Switch(config)# interface vlan 1
Switch(config-if)# no ipv6 mld query-interval
```

## Related Commands

ipv6 mld querier-timeout

ipv6 mld query-max-response-time

# 9.2.10 ipv6 mld query-max-response-time

## Command Purpose

Use this command to set the mld query max response time.

To reset it to default value, use the no form of this command.

## Command Syntax

ipv6 mld query-max-response-time *INTERVAL*

no ipv6 query-max-response-time

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INTERVAL | The mld query max response time, range is 1 to 25s. | 1-25 |

## Command Mode

Interface Configuration

## Default

10s

## Usage

Query max response time must be less than mld query interval.

## Examples

This example shows how to set the mld query max response time to 20 seconds:

```
Switch# configure terminal
Switch(config)# interface vlan 1
Switch(config-if)# ipv6 mld query-max-response-time 20
```

This example shows how to return the mld query max response time to default value:

```
Switch# configure terminal
Switch(config)# interface vlan 1
Switch(config-if)# no ipv6 mld query-max-response-time
```

## Related Commands

ipv6 mld querier-timeout

ipv6 mld query-interval

# 9.2.11 ipv6 mld robustness-variable

## Command Purpose

Use this command to set the mld querier robustness variable value.

To reset it to default value, use the no form of this command.

## Command Syntax

ipv6 mld robustness-variable *VALUE*

no ipv6 robustness-variable

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| VALUE | The mld querier robustness variable value, range is 2 to 7. | 2-7 |

## Command Mode

Interface Configuration

## Default

2

## Usage

None

## Examples

This example shows how to set the mld querier robustness variable value to 6:

```
Switch# configure terminal
Switch(config)# interface vlan 1
Switch(config-if)# ipv6 mld robustness-variable 6
```

This example shows how to reset the mld querier robustness variable value to default value:

```
Switch# configure terminal
Switch(config)# interface vlan 1
Switch(config-if)# no ipv6 mld robustness-variable
```

## Related Commands

show ipv6 mld interface

# 9.2.12 ipv6 mld version

## Command Purpose

Use this command to set the mld version on interface.

To return it to default value, use the no form of this command.

## Command Syntax

ipv6 mld version *NUMBER*

no ipv6 version

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NUMBER | The mld version on the interface | 1-2 |

## Command Mode

Interface Configuration

## Default

1

## Usage

None

## Examples

This example shows how to set the mld version 2 on the interface:

```
Switch# configure terminal
Switch(config)# interface vlan 1
Switch(config-if)# ipv6 mld version 2
```

This example shows how to return the mld version to default value:

```
Switch# configure terminal
Switch(config)# interface vlan 1
Switch(config-if)# no ipv6 mld version
```

## Related Commands

show ipv6 mld interface

## 9.2.13 ipv6 mld static-group

### Command Purpose

Use this command to configure the static multicast group on interface.

To delete static group, use the no form of this command.

### Command Syntax

ipv6 mld static-group *GRP_IPV6_ADDR* ( source *SRC_IPV6_ADDR* | )

no ipv6 mld static-group *GRP_IPV6_ADDR* ( source *SRC_IPV6_ADDR* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| GRP_IPV6_ADDR | The multicast group address | IPv6 address |
| SRC_IPV6_ADDR | The multicast source address | IPv6 address |

### Command Mode

Interface Configuration

### Default

None

### Usage

None

### Examples

This example shows how to configure the static mld group on interface:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ipv6 mld static-group ff0e::1234
Switch(config-if)# ipv6 mld static-group ff0e::1234 source 2001::2
```

This example shows how to delete static mld group on interface:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no ipv6 mld static-group ff02::1234
```

### Related Commands

show ipv6 mld groups

## 9.2.14 ipv6 mld ssm-map enable

### Command Purpose

Use this command to enable mld ssm mapping.

To disable ssm mapping, use the no form of this command.

### Command Syntax

ipv6 mld ssm-map enable

no ipv6 mld ssm-map enable

### Command Mode

Global Configuration

### Default

Disable

### Usage

None

### Examples

This example shows how to enable mld ssm mapping:

```
Switch# configure terminal
Switch(config)# ipv6 mld ssm-map enable
```

This example shows how to disable mld ssm mapping:

```
Switch# configure terminal
Switch(config)# no ipv6 mld ssm-map enable
```

### Related Commands

None

## 9.2.15 ipv6 mld ssm-map static

### Command Purpose

Use this command to set mld ssm mapping.

To cancel ssm mapping setting, use the no form of this command.

### Command Syntax

ipv6 mld ssm-map static *LISTNAME SRC_IPV6_ADDR*

no ipv6 mld ssm-map static *LISTNAME SRC_IPV6_ADDR*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LISTNAME | Specify multicast group address range access list | A string with 1-20 characters |
| SRC_IPV6_ADDR | Multicast source address | IPv6 address |

### Command Mode

Global Configuration

### Default

Disable

### Usage

None

### Examples

This example shows how to set mld ssm mapping:

```
Switch# configure terminal
Switch(config)# ipv6 mld ssm-map static ipacl 2001::2
```

This example shows how to unset mld ssm mapping:

```
Switch# configure terminal
Switch(config)# no ipv6 mld ssm-map static ipacl 2001::2
```

### Related Commands

None

## 9.2.16 clear ipv6 mld

### Command Purpose

Use this command to clear mld groups.

### Command Syntax

clear ipv6 mld group ( * | *IPV6_ADDR* )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| * | All multicast group address | - |
| IPV6_ADDR | Specify multicast group address | IPv6 address |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to clear mld group all:

```
Switch# clear ipv6 mld
Switch# clear ipv6 mld group *
```

This example shows how to clear mld specified group:

```
Switch# clear ipv6 mld group ff02::1234
```

### Related Commands

show ipv6 mld groups

## 9.2.17 clear ipv6 mld interface

### Command Purpose

Use this command to clear mld groups on specified interface.

### Command Syntax

clear ipv6 mld ( group *IPV6_ADDR* | interface ) *IFNAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IPV6_ADDR | Specify multicast group address | IPv6 address |
| IFNAME | Interface name | Support physical/aggregation/loopback/vlan/tunnel ports |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to clear mld group on specified interface:

```
Switch# clear ipv6 mld group interface eth-0-1
```

### Related Commands

show ipv6 mld groups

## 9.2.18 show ipv6 mld groups

### Command Purpose

Use this command to show the information about mld groups.

### Command Syntax

show ipv6 mld groups *IPV6_ADDR* ( detail | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IPV6_ADDR | Specify multicast group address | IPv6 address |
| detail | Detailed Information | - |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to display the detail information about mld groups:

```
Switch# show ipv6 mld groups detail
MLD Connected Group Membership Details for eth-0-2
Interface:      eth-0-2
Group:          ff0e::1234:5678
Uptime:         00:00:10
Group mode:     Exclude (Expires: 00:04:10)
```

```
Last reporter:  fe80:1111:1111:1111:1111:1111:1111:1111
Source list is empty
```

### Related Commands

None

## 9.2.19 show ipv6 mld groups interface

### Command Purpose

Use this command to show the information about mld groups on interface.

### Command Syntax

show ipv6 mld groups *IFNAME* ( *IPV6_ADDR* | ) ( detail | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | Interface name | Support physical/aggregation/loopback/vlan/tunnel ports |
| IPV6_ADDR | Specify multicast group address | IPv6 address |
| detail | Detailed Information | - |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to display the information about mld groups on interface eth-0-1:

```
Switch# show ipv6 mld groups eth-0-1
MLD Connected Group Membership
Group Address                           Interface            Expires
ff0e::1234:5678                         eth-0-2              00:03:01
```

### Related Commands

None

## 9.2.20 show ipv6 mld groups count

### Command Purpose

Use this command to show mld group number.

### Command Syntax

show ipv6 mld groups ( *IFNAME* | ) count

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | Interface name | Support physical/aggregation/loop back/vlan/tunnel ports |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to display the mld group number on interface eth-0-1:

```
Switch# show ipv6 mld groups eth-0-1 count
Dynamic multicast groups count: 1
```

```
Static multicast groups count: 0
Total multicast groups count: 1
```

### Related Commands

None

## 9.2.21 show ipv6 mld interface

### Command Purpose

Use this command to show the information about mld on interface.

### Command Syntax

show ipv6 mld interface ( *IFNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | Interface name | Support physical/aggregation/loopback/vlan/tunnel ports |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to display the information about mld on interface eth-0-1:

```
Switch# show ipv6 mld interface eth-0-1
Interface eth-0-1 (Index 1)
MLD Active, Querier, Version 1 (default)
Internet address is fe80::9c7c:7eff:fe94:8300
MLD interface has 0 group-record states
```

```
MLD activity: 0 joins, 0 leaves
MLD query interval is 125 seconds
MLD querier timeout is 255 seconds
MLD max query response time is 10 seconds
Last member query response interval is 1000 milliseconds
Group Membership interval is 260 seconds
```

### Related Commands

None

## 9.3 MLD Snooping Commands

### 9.3.1 ipv6 mld snooping

#### Command Purpose

Use this command to enable mld snooping.

To disable mld snooping, use the no form of this command.

#### Command Syntax

ipv6 mld snooping ( vlan *VLAN_ID* | )

no ipv6 mld snooping ( vlan *VLAN_ID* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan ID | 1-4094 |

#### Command Mode

Global Configuration

#### Default

Disable

#### Usage

Mld Snooping can be enabled globally and per vlan. By default, mld snooping should be disabled globally and per vlan.

## Examples

This example shows how to enable mld snooping:

```
Switch# configure terminal
Switch(config)# ipv6 mld snooping
```

This example shows how to disable mld snooping:

```
Switch# configure terminal
Switch(config)# no ipv6 mld snooping
```

This example shows how to enable mld snooping on vlan 10:

```
Switch# configure terminal
Switch(config)# ipv6 mld snooping vlan 10
```

This example shows how to disable mld snooping on vlan 10:

```
Switch# configure terminal
Switch(config)# no ipv6 mld snooping vlan 10
```

## Related Commands

show ipv6 mld snooping

# 9.3.2 ipv6 mld snooping fast-leave

## Command Purpose

Use this command to enable mld snooping fast leave.

To disable it, use the no form of this command.

## Command Syntax

ipv6 mld snooping ( vlan *VLAN_ID* | ) fast-leave

no ipv6 mld snooping ( vlan *VLAN_ID* | ) fast-leave

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan ID | 1-4094 |

## Command Mode

Global Configuration

## Default

Disable

## Usage

This command will overide immediate-leave setting.

## Examples

This example shows how to enable mld snooping fast-leave:

```
Switch# configure terminal
Switch(config)# ipv6 mld snooping fast-leave
```

This example shows how to disable mld snooping fast-leave:

```
Switch# configure terminal
Switch(config)# no ipv6 mld snooping fast-leave
```

## Related Commands

show ipv6 mld snooping global

# 9.3.3 ipv6 mld snooping last-member-query-interval

## Command Purpose

Use this command to set the last member query interval of mld snooping.

To reset it to default value, use the no form of this command.

## Command Syntax

ipv6 mld snooping ( vlan *VLAN_ID* | ) last-member-query-interval *INTERVAL*

no ipv6 mld snooping ( vlan *VLAN_ID* | ) last-member-query-interval

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan ID | 1-4094 |
| INTERVAL | The last member query interval | 1000-25500 |

### Command Mode

Global Configuration

### Default

1000ms

### Usage

Mld last member query interval can be configured per vlan. The default is 1000ms and the range is 1000-25500ms.

### Examples

This example shows how to set the last member query interval:

```
Switch# configure terminal
Switch(config)# ipv6 mld snooping last-member-query-interval 2000
```

This example shows how to reset the last member query interval to default value:

```
Switch# configure terminal
Switch(config)# no ipv6 mld snooping last-member-query-interval
```

### Related Commands

show ipv6 mld snooping

show ipv6 mld snooping vlan

## 9.3.4 ipv6 mld snooping global source-address

### Command Purpose

Use this command to set the global source address.

To reset it to default value, use the no form of this command.

### Command Syntax

ipv6 mld snooping global source-address *IPV6_ADDR*

no ipv6 mld snooping global source-address

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| IPV6_ADDR | The IPv6 address of source address | IPv6 Address |

## Command Mode

Global Configuration

## Default

The defaul IPv6 address is :: （All zero in 128 bits IPv6 address）

## Usage

Will use global configured source-address if vlan is not configured，otherwise， use source-address config from vlan.

## Examples

This example shows how to set the global source address to fe80::1:

```
Switch# configure terminal
Switch(config)# ipv6 mld snooping global source-address fe80::1
```

This example shows how to reset the global source address to default value:

```
Switch# configure terminal
Switch(config)# no ipv6 mld snooping global source-address
```

## Related Commands

show ipv6 mld snooping querier

# 9.3.5 ipv6 mld snooping max-member-num

## Command Purpose

Use this command to set the max allowed member number.

To reset it to default value, use the no form of this command.

## Command Syntax

ipv6 mld snooping ( vlan *VLAN_ID* | ) max-member-num *NUMBER*

no ipv6 mld snooping ( vlan *VLAN_ID* | ) max-member-num

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan ID | 1-4094 |
| NUMBER | The max member number of mld snooping | 1-4096 |

## Command Mode

Global Configuration

## Default

4096

## Usage

None

## Examples

This example shows how to set the max member number of mld snooping to 1024:

```
Switch# configure terminal
Switch(config)# ipv6 mld snooping max-member-num 1024
```

This example shows how to reset the max member number to default value:

```
Switch# configure terminal
Switch(config)# no ipv6 mld snooping max-member-num
```

## Related Commands

show ipv6 mld snooping global

show ipv6 mld snooping vlan

## 9.3.6 ipv6 mld snooping query-interval

### Command Purpose

Use this command to set the mld snooping query-interval.

To reset the query-interval to default value, use the no form of this command.

### Command Syntax

ipv6 mld snooping ( vlan *VLAN_ID* | ) query-interval *INTERVAL*

no ipv6 mld snooping ( vlan *VLAN_ID* | ) query-interval

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan ID | 1-4094 |
| INTERVAL | The query-interval of mld snooping (seconds), range is 2 to 18000 | 2-18000 |

### Command Mode

Global Configuration

### Default

125s

### Usage

Query interval can't less than the mld snooping query max response time.

### Examples

This example shows how to set the mld snooping query interval to 64s:

```
Switch# configure terminal
Switch(config)# ipv6 mld snooping query-interval 64
```

This example shows how to reset the query-interval to default value:

```
Switch# configure terminal
Switch(config)# no ipv6 mld snooping query-interval
```

### Related Commands

show ipv6 mld snooping querier

show ipv6 mld snooping querier vlan

## 9.3.7 ipv6 mld snooping query-max-response-time

### Command Purpose

Use this command to set the mld snooping query-interval.

To return the query-interval to default value, use the no form of this command.

### Command Syntax

ipv6 mld snooping ( vlan *VLAN_ID* | ) query-max-response-time *TIME*

no ipv6 mld snooping ( vlan *VLAN_ID* | ) *query-max-response-TIME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan ID | 1-4094 |
| TIME | The query max response time (seconds) | 1-25 |

### Command Mode

Global Configuration

### Default

10s

### Usage

Query interval can't less than the mld snooping query max response time.

### Examples

This example shows how to set the mld snooping query max response time to 15s:

```
Switch# configure terminal
Switch(config)# ipv6 mld snooping query-max-response-time 15
```

This example shows how to return the query max response time to default value:

```
Switch# configure terminal
Switch(config)# no ipv6 mld snooping query-max-response-time
```

### Related Commands

show ipv6 mld snooping querier

show ipv6 mld snooping querier vlan

## 9.3.8 ipv6 mld snooping report-suppression

### Command Purpose

Use this command to enable report suppression.

To disable report suppression, use the no form of this command.

### Command Syntax

ipv6 mld snooping ( vlan *VLAN_ID* | ) report-suppression

no ipv6 mld snooping ( vlan *VLAN_ID* | ) report-suppression

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan ID | 1-4094 |

### Command Mode

Global Configuration

### Default

Enable

### Usage

Will not do report suppression when MLD snooping works in v2 mode.

### Examples

This example shows how to enable the report suppression:

```
Switch# configure terminal
Switch(config)# ipv6 mld snooping report-suppression
```

This example shows how to disable report suppression:

```
Switch# configure terminal
Switch(config)# no ipv6 mld snooping report-suppression
```

### Related Commands

show ipv6 mld snooping

show ipv6 mld snooping vlan

## 9.3.9 ipv6 mld snooping version

### Command Purpose

Use this command to set the mld snooping version.

To return it to default value, use the no form of this command.

### Command Syntax

ipv6 mld snooping ( vlan *VLAN_ID* | ) version *VERSION*

no ipv6 mld snooping ( vlan *VLAN_ID* | ) version

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan ID | 1-4094 |
| VERSION | Mld snooping version, range is 1 to 2. | 1-2 |

### Command Mode

Global Configuration

### Default

Default Mld snooping version is 1

### Usage

The default version is 1.

## Examples

This example shows how to set the mld snooping version 2:

```
Switch# configure terminal
Switch(config)# ipv6 mld snooping version 2
```

## Related Commands

show ipv6 mld snooping

show ipv6 mld snooping vlan

# 9.3.10 ipv6 mld snooping discard-unknown

## Command Purpose

Use this command to enable discard unknown.

To disable discard unknown, use the no form of this command.

## Command Syntax

ipv6 mld snooping ( vlan *VLAN_ID* | ) discard-unknown

no ipv6 mld snooping ( vlan *VLAN_ID* | ) discard-unknown

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan ID | 1-4094 |

## Command Mode

Global Configuration

## Default

Enabled by default, unknown multicast traffic will flood in vlan.

## Usage

None

## Examples

This example shows how to enable discard-unknown multicast traffic:

```
Switch# configure terminal
Switch(config)# ipv6 mld snooping discard-unknown
```

## Related Commands

show ipv6 mld snooping

show ipv6 mld snooping vlan

# 9.3.11 ipv6 mld snooping querier tcn

## Command Purpose

Use this command to set MLD snooping querier TCN related parameters.To reset it to default value, use the no form of this command.

## Command Syntax

ipv6 mld snooping querier tcn ( enable | query-count *COUNT* | query-interval *INTERVAL* | query-max-response-time *TIME* )

no ipv6 mld snooping querier tcn ( enable | query-count | query-interval | query-max-response-time )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| enable | MLD querier TCN query enable | - |
| COUNT | MLD querier TCN query count, default is 2. | 1-10 |
| INTERVAL | MLD querier TCN query interval, default is 10s. | 1-255 seconds |
| TIME | MLD querier TCN query max response time, default is 5s | 1-9 seconds |

## Command Mode

Global Configuration

## Default

This feature is enabled by default, default query count is 2, default query interval is 10s, maximum response time is 5s

## Usage

None

## Examples

This example shows how to use ipv6 mld snooping querier tcn command:

```
Switch# configure terminal
Switch(config)# ipv6 mld snooping querier tcn query-count 2
```

## Related Commands

show ipv6 mld snooping querier

# 9.3.12 ipv6 mld snooping vlan access-group

## Command Purpose

Use this command to set mld snooping access group on vlan.

## Command Syntax

ipv6 mld snooping vlan *vlan_id* access-group acl

no ipv6 mld snooping vlan *vlan_id* access-group

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| vlan_id | Vlan ID, range is 1 to 4094. | 1-4094 |
| acl | IPV6 Named Standard Access list. | - |

## Command Mode

Global Configuration

## Default

None

## Usage

None

## Examples

This example shows how to use apply access-group on vlan 10:

```
Switch# configure terminal
Switch(config)# ipv6 mld snooping vlan 10 access-group acl
```

This example shows how to remove access-group from vlan 10:

```
Switch# configure terminal
Switch(config)# no ipv6 mld snooping vlan 10 access-group
```

## Related Commands

show ipv6 mld snooping vlan

# 9.3.13 ipv6 mld snooping vlan mrouter interface

## Command Purpose

Use this command to set mld snooping mrouter interface on vlan.

## Command Syntax

ipv6 mld snooping vlan *VLAN_ID* mrouter interface *IFNAME*

no ipv6 mld snooping vlan *vlan_id* mrouter interface *IFNAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan ID | 1-4094 |
| IFNAME | Mrouter interface on this vlan | Support physical/aggregation/loop back/vlan/tunnel ports |

## Command Mode

Global Configuration

## Default

None

## Usage

The specificed interface must have already joined the configured vlan.

## Examples

This example shows how to set eth-0-1 as mrouter interface on vlan 10:

```
Switch# configure terminal
Switch(config)# ipv6 mld snooping vlan 10 mrouter interface eth-0-1
```

This example shows how to unset eth-0-1 as mrouter interface on vlan 10:

```
Switch# configure terminal
Switch(config)# no ipv6 mld snooping vlan 10 mrouter interface eth-0-1
```

## Related Commands

show ipv6 mld snooping vlan

# 9.3.14 ipv6 mld snooping vlan mrouter-aging-interval

## Command Purpose

Use this command to set mld snooping mrouter interface aging interval on vlan.

## Command Syntax

ipv6 mld snooping vlan *VLAN_ID* mrouter-aging-interval *INTERVAL*

no ipv6 mld snooping vlan *VLAN_ID mrouter-aging-INTERVAL*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan ID | 1-4094 |

| | | |
|---|---|---|
| INTERVAL | Dynamic mrouter interface aging interval on this vlan(seconds) | 1-65535 |

## Command Mode

Global Configuration

## Default

255s

## Usage

None

## Examples

This example shows how to set dynamic mrouter interface aging interval as 100 seconds on vlan 10:

```
Switch# configure terminal
Switch(config)# ipv6 mld snooping vlan 10 mrouter-aging-interval 100
```

This example shows how to reset dynamic mrouter interface aging interval as default on vlan 10:

```
Switch# configure terminal
Switch(config)# no ipv6 mld snooping vlan 10 mrouter-aging-interval
```

## Related Commands

show ipv6 mld snooping vlan

# 9.3.15 ipv6 mld snooping vlan querier

## Command Purpose

Use this command to enable mld snooping querier on vlan.

## Command Syntax

ipv6 mld snooping vlan *VLAN_ID* querier

no ipv6 mld snooping vlan *VLAN_ID* querier

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan ID | 1-4094 |

## Command Mode

Global Configuration

## Default

Disable

## Usage

None

## Examples

This example shows how to enable querier on vlan 10:

```
Switch# configure terminal
Switch(config)# ipv6 mld snooping vlan 10 querier
```

This example shows how to disable querier on vlan 10:

```
Switch# configure terminal
Switch(config)# no ipv6 mld snooping vlan 10 querier
```

## Related Commands

show ipv6 mld snooping querier vlan

# 9.3.16 ipv6 mld snooping vlan querier address

## Command Purpose

Use this command to set mld snooping querier address on vlan.

## Command Syntax

ipv6 mld snooping vlan *VLAN_ID* querier address *IPV6_ADDR*

no ipv6 mld snooping vlan *VLAN_ID* querier address *IPV6_ADDR*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan ID | 1-4094 |
| IPV6_ADDR | The address of querier on this vlan | IPv6 Address |

## Command Mode

Global Configuration

## Default

None

## Usage

Will use global configured source-address if vlan is not configured，otherwise， use source-address config from vlan.

## Examples

This example shows how to set querier address on vlan 10:

```
Switch# configure terminal
Switch(config)# ipv6 mld snooping vlan 10 querier address fe80::1
```

This example shows how to unset querier address on vlan 10:

```
Switch# configure terminal
Switch(config)# no ipv6 mld snooping vlan 10 querier address
```

## Related Commands

show ipv6 mld snooping querier vlan

# 9.3.17 ipv6 mld snooping vlan querier-timeout

## Command Purpose

Use this command to set mld previous querier timeout interval on this vlan.To reset it to default, use the no form of this command.

## Command Syntax

ipv6 mld snooping vlan *VLAN_ID* querier-timeout *INTERVAL*

no ipv6 mld snooping vlan *vlan_id* querier-timeout

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan ID | 1-4094 |
| INTERVAL | The mld previous querier timeout interval on this VLAN (seconds) | 60-300 |

## Command Mode

Global Configuration

## Default

255s

## Usage

None

## Examples

This example shows how to set previous querier timeout interval as 100 seconds on vlan 10:

```
Switch# configure terminal
Switch(config)# ipv6 mld snooping vlan 10 querier address 2001::2
```

This example shows how to reset previous querier timeout interval on vlan 10:

```
Switch# configure terminal
Switch(config)# no ipv6 mld snooping vlan 10 querier-timeout
```

## Related Commands

show ipv6 mld snooping querier vlan

# 9.3.18 ipv6 mld snooping vlan static-group

## Command Purpose

Use this command to add static mld group on this vlan.To remove this setting, use the no form of this command.

## Command Syntax

ipv6 mld snooping vlan *VLAN_ID* static-group *GRP_IPV6_ADDR* ( source *SRC_IPV6_ADDR* | ) interface *IFNAME*

no ipv6 mld snooping vlan *VLAN_ID* static-group *GRP_IPV6_ADDR* ( source *SRC_IPV6_ADDR* | ) interface *IFNAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan ID | 1-4094 |
| GRP_IPV6_ADDR | The address of group configured on the specified interface. | IPv6 Address |
| SRC_IPV6_ADDR | The address of source configured on the specified interface. | IPv6 Address |
| IFNAME | The interface configured as a member of specified group on this vlan | Support physical/aggregation ports |

## Command Mode

Global Configuration

## Default

None

## Usage

None

## Examples

This example shows how to add group ff0e::1234 on interface eth-0-11 of vlan 10:

```
Switch# configure terminal
Switch(config)# ipv6 mld snooping vlan 10 querier-timeout 100
```

This example shows how to remove group ff0e::1234 from interface eth-0-11 of vlan 10:

```
Switch# configure terminal
Switch(config)# no ipv6 mld snooping vlan 10 static-group ff0e::1234 interface eth-0-11
```

### Related Commands

show ipv6 mld snooping group

## 9.3.19 clear ipv6 mld snooping group

### Command Purpose

Use this command to clear all mld snooping groups.

### Command Syntax

clear ipv6 mld snooping ( group * | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| * | All multicast group address | - |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to clear mld snooping group all:

```
Switch# clear ipv6 mld snooping
```

### Related Commands

None

## 9.3.20 clear ipv6 mld snooping vlan group

### Command Purpose

Use this command to clear mld snooping groups on vlan.

### Command Syntax

clear ipv6 mld snooping vlan *VLAN_ID*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan ID | 1-4094 |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to clear mld snooping group on vlan 10:

```
Switch# clear ipv6 mld snooping vlan 10
```

### Related Commands

None

## 9.3.21 show ipv6 mld snooping global

### Command Purpose

Use this command to show the global configurations of mld snooping.

### Command Syntax

show ipv6 mld snooping global

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to display the global configurations of mld snooping:

```
Switch# show ipv6 mld snooping global
Global Mld Snooping Configuration
-------------------------------------------------
Mld Snooping                              :Enabled
Mld Snooping Fast-Leave                   :Disabled
Mld Snooping Version                      :1
Mld Snooping Max-Member-Number            :4096
Mld Snooping Unknown Multicast Behavior   :Flood
Mld Snooping Report-Suppression           :Enabled
```

### Related Commands

None

## 9.3.22 show ipv6 mld snooping groups

### Command Purpose

Use this command to show the mld snooping groups.

### Command Syntax

show ipv6 mld snooping groups

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to display mld snooping groups:

```
Switch# show ipv6 mld snooping groups
VLAN  Interface  Group Address                              Uptime     Expire-time
1     eth-0-3    ff0e:2111:1111:1111:1111:1111:1234:5678  00:00:04   00:04:16
```

### Related Commands

None

## 9.3.23 show ipv6 mld snooping groups vlan

### Command Purpose

Use this command to show the mld snooping groups on vlan.

## Command Syntax

show ipv6 mld snooping groups vlan *VLAN_ID* ( *group_address* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan ID | 1-4094 |
| group-address | The address of group | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to display mld snooping groups on vlan 1:

```
Switch# show ipv6 mld snooping groups vlan 1
MLD Snooping groups for vlan1
Interface:      eth-0-3
Group:          ff0e:2111:1111:1111:1111:1111:1234:5678
Uptime:         00:00:42
Group mode:     Exclude (Expires: 00:03:38)
Last reporter:  fe80:1111:1111:1111:1111:1111:1111:1111
Source list is empty
```

## Related Commands

None

# 9.3.24 show ipv6 mld snooping groups count

## Command Purpose

Use this command to show the mld snooping groups number.

## Command Syntax

show ipv6 mld snooping groups ( vlan *VLAN_ID* | ) count

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan ID | 1-4094 |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to display mld snooping groups number on vlan 1:

```
Switch# show ipv6 mld snooping groups vlan 1 count
Dynamic multicast groups count: 1
Static multicast groups count: 0
Total multicast groups count: 1
```

## Related Commands

None

# 9.3.25 show ipv6 mld snooping querier

## Command Purpose

Use this command to show the configurations of mld snooping querier information.

## Command Syntax

show ipv6 mld snooping querier ( vlan *VLAN_ID* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan ID | 1-4094 |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to display the configurations of mld snooping querier on vlan 1:

```
Switch# show ipv6 mld snooping querier vlan 1
Global Mld Snooping Querier Configuration
-------------------------------------------------
Version                          :1
Last-Member-Query-Interval (msec) :1000
Max-Query-Response-Time (sec)     :10
Query-Interval (sec)              :125
Global Source-Address             :::
TCN Query Count                   :2
TCN Query Interval (sec)          :10
Vlan 1:   MLD snooping querier status
-----------------------------------------
Elected querier is : ::
-----------------------------------------
Admin state                       :Disabled
Admin version                     :1
Operational state                 :Non-Querier
Querier operational address       :::
Querier configure address         :N/A
Last-Member-Query-Interval (msec) :1000
Max-Query-Response-Time (sec)     :10
Query-Interval (sec)              :125
Querier-Timeout (sec)             :255
```

## Related Commands

None

# 9.3.26 show ipv6 mld snooping mrouter

## Command Purpose

Use this command to show the information of mld snooping mrouter port on vlan.

## Command Syntax

show ipv6 mld snooping mrouter ( vlan *VLAN_ID* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan ID | 1-4094 |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to display the information of mld snooping mrouter port on vlan 1:

```
Switch# show ipv6 mld snooping mrouter  vlan 1
VLAN    Interface      Mode      Uptime     Expires-time
2       eth-0-1        static    -          -
```

## Related Commands

None

# 9.3.27 show ipv6 mld snooping vlan

## Command Purpose

Use this command to show the configurations of mld snooping on vlan.

## Command Syntax

show ipv6 mld snooping ( vlan *VLAN_ID* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan ID | 1-4094 |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to display the configurations of mld snooping on vlan 1:

```
Switch# show ipv6 mld snooping vlan 1
Global Mld Snooping Configuration
------------------------------------------------
Mld Snooping                              :Enabled
Mld Snooping Fast-Leave                   :Disabled
Mld Snooping Version                      :1
Mld Snooping Max-Member-Number            :4096
Mld Snooping Unknown Multicast Behavior   :Flood
Mld Snooping Report-Suppression           :Enabled
Vlan 2
-----------
Mld Snooping                              :Enabled
Mld Snooping Fast-Leave                   :Disabled
Mld Snooping Report-Suppression           :Enabled
Mld Snooping Version                      :1
Mld Snooping Max-Member-Number            :4096
```

```
Mld Snooping Unknown Multicast Behavior  :Flood
Mld Snooping Group Access-list           :N/A
Mld Snooping Mrouter Port                :eth-0-1(static)
Mld Snooping Mrouter Port Aging Interval(sec) :255
```

### Related Commands

None

## 9.3.28 show resource l2mcast

### Command Purpose

Use this command to display the resource usage of L2 mcast.

### Command Syntax

show resource l2mcast

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following is sample output from the show resource l2mcast command:

```
Switch# show resource l2mcast
L2MCAST
Resource                        Used          Capability
================================================================
L2 Mcast Entry                  1             1024
L2 Mcast Member                 2             8192
```

### Related Commands

None

## 9.4 PIMv6 Commands

### 9.4.1 ipv6 pim accept-register

### Command Purpose

Use this command to apply an access-list to limit the ipv6 pim register message received by rp.

To remove this setting, use the no form of this command.

### Command Syntax

ipv6 pim accept-register list *LISTNAME*

no ipv6 pim accept-register

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LISTNAME | The name of the access-list to be applied. | A string with 1-20 characters |

### Command Mode

Global Configuration

### Default

None

### Usage

This feature is used to prevent the unauthorized user registered to the switch.

When enable this feature, the system will send back a register stop message when the unauthorized register message is received.

## Examples

This example shows how to apply the access-list acl1 to limit the ipv6 pim register message received by rp:

```
Switch# configure terminal
Switch(config)# ipv6 pim accept-register list acl1
```

This example shows how to remove the limits:

```
Switch# configure terminal
Switch(config)# no ipv6 pim accept-register
```

## Related Commands

None

# 9.4.2 ipv6 pim anycast-rp

## Command Purpose

Use this command to set anycast rendezvous-point.

To remove the configurations, use the no form of this command.

## Command Syntax

ipv6 pim anycast-rp *ANYCAST_RP_ADDR ANYCAST_MEMBER_ADDR*

no ipv6 pim anycast-rp *ANYCAST_RP_ADDR* ( *ANYCAST_MEMBER_ADDR* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ANYCAST_RP_ADDR | Anycast rp address | IPv6 address |
| IPv6 address | IPv6 地址 | IPv6 address |

## Command Mode

Global Configuration

## Default

None

## Usage

Should configure every router in the network, and must configure same RP address.

## Examples

This example shows how to set anycast rendezvous-point:

```
Switch# configure terminal
Switch(config)# ipv6 pim anycast-rp 2001::2 2001::10
```

This example shows how to remove the member in anycast rendezvous-point:

```
Switch# configure terminal
Switch(config)# no ipv6 pim anycast-rp 2001::2 2001::10
```

## Related Commands

None

# 9.4.3 ipv6 pim bsr-candidate

## Command Purpose

Use this command to configure the candidate bootstrap router (candidate BSR).

To remove the configurations, use the no form of this command.

## Command Syntax

ipv6 pim bsr-candidate *IFNAME* ( *HASH_MASK* ( *PRIORITY* ) | )

no ipv6 pim bsr-candidate

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | Interface name | Support physical/aggregation/loopback/vlan/tunnel ports |
| HASH_MASK | Hash mask length for RP selection | 0-128 |
| PRIORITY | Priority value for candidate bootstrap router | 0-255 |

## Command Mode

Global Configuration

## Default

No ipv6 pim bsr-candidate by default

The default hash mask length is 10

The default priority value for candidate bootstrap router is 64

## Usage

None

## Examples

This example shows how to configure the candidate BSR:

```
Switch# configure terminal
Switch(config)# ipv6 pim bsr-candidate eth-0-1
```

This example shows how to cancel the candidate BSR configured:

```
Switch# configure terminal
Switch(config)# no ipv6 pim bsr-candidate
```

## Related Commands

ipv6 pim bsr-border

# 9.4.4 ipv6 pim bsr-border

## Command Purpose

Use this command to configure the border of pim domain.

To remove the configurations of the border of pim domain, use the no form of this command.

## Command Syntax

ipv6 pim bsr-border

no ipv6 pim bsr-border

### Command Mode

Interface Configuration

### Default

None

### Usage

None

### Examples

This example shows how to configure the border of pim domain:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ipv6 pim bsr-border
```

This example shows how to remove the configurations of the border of pim domain:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no ipv6 pim bsr-border
```

### Related Commands

ipv6 pim bsr-candidate

## 9.4.5 ipv6 pim dr-priority

### Command Purpose

Use this command to configure the DR priority.

To return it to default value, use the no form of this command.

### Command Syntax

ipv6 pim dr-priority *PRIORITY*

no ipv6 pim dr-priority

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PRIORITY | The DR priority | 0-4294967294 |

## Command Mode

Interface Configuration

## Default

1

## Usage

When a hello message without DR priority is received, it will be regarded to have the max DR priority and to be elected as DR. When more than one router's hello messages do not have DR priority, the one which have the highest ipv6 address will be elected as DR.

## Examples

This example shows how to set the pim router DR priority to 1000:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ipv6 pim dr-priority 1000
```

This example shows how to return the pim router DR priority to default value:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no ipv6 pim dr-priority
```

## Related Commands

None

## 9.4.6 ipv6 pim exclude-genid

### Command Purpose

Use this command to exclude generation id option from pim hello packets on this interface.

To return to the default setting, use the no form of this command.

### Command Syntax

ipv6 pim exclude-genid

no ipv6 pim exclude-genid

### Command Mode

Interface Configuration

### Default

Disable

### Usage

GenerationID is the ID of a PIM neighbour, it is carried in PIM hello message,the receiver device will record every received GenerationID in the hello packet and check if GenerationID has changed, if GenerationID changed, will consider neighbour state changed and restart state machine.

### Examples

This example shows how to exclude generation id option from pim hello packets on this interface:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ipv6 pim exclude-genid
```

This example shows how to return the generation id option to the default setting:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no ipv6 pim exclude-genid
```

### Related Commands

None

## 9.4.7 ipv6 pim hello-interval

### Command Purpose

Use this command to configure the interval for pim hello packets on this interface.

To reset to the default setting, use the no form of this command.

### Command Syntax

ipv6 pim hello-interval *INTERVAL*

no ipv6 pim hello-interval

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INTERVAL | The pim hello message interval (second) | 1-65535 |

### Command Mode

Interface Configuration

### Default

30s

### Usage

None

### Examples

This example shows how to set the pim hello message interval to 100s:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ipv6 pim hello-interval 100
```

This example shows how to reset the pim hello message interval to default value:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no ipv6 pim hello-interval
```

### Related Commands

None

## 9.4.8 ipv6 pim ignore-rp-set-priority

### Command Purpose

Use this command to ignore RP set priority value.

To not ignore the priority, use the no form of this command.

### Command Syntax

ipv6 pim ignore-rp-set-priority

no ipv6 pim ignore-rp-set-priority

### Command Mode

Global Configuration

### Default

Not ignore RP set priority value.

### Usage

None

### Examples

This example shows how to ignore RP set priority value:

```
Switch# configure terminal
Switch(config)# ipv6 pim ignore-rp-set-priority
```

This example shows how to return the configurations to default value:

```
Switch# configure terminal
Switch(config)# no ipv6 pim ignore-rp-set-priority
```

### Related Commands

None

## 9.4.9 ipv6 pim jp-timer

### Command Purpose

Use this command to set the join/prune timer value.

To return the timer to default value, use the no form of this command.

### Command Syntax

ipv6 pim jp-timer *SECOND*

no ipv6 pim jp-timer

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SECOND | The Join/Prune timer value (second) | 1-65535 |

### Command Mode

Global Configuration

### Default

60s

### Usage

None

## Examples

This example shows how to set the join/prune timer value to 100s:

```
Switch# configure terminal
Switch(config)# ipv6 pim jp-timer 100
```

This example shows how to return the join/prune timer value to default value:

```
Switch# configure terminal
Switch(config)# no ipv6 pim jp-timer
```

## Related Commands

None

# 9.4.10 ipv6 pim neighbor-filter

## Command Purpose

Use this command to add an access-list to filter the neighbor.

To remove this filter, use the no form of this command.

## Command Syntax

ipv6 pim neighbor-filter *LISTNAME*

no ipv6 pim neighbor-filter

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LISTNAME | The name of the access-list | A string with 1-20 characters |

## Command Mode

Interface Configuration

## Default

None

## Usage

Neighbours would send hello message to eachother to establish connections with other neighbour， you can use this command to filter which neighbour can be connected or not.

## Examples

This example shows how to establish neighbors based on access-list acl1:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ipv6 pim neighbor-filter acl1
```

This example shows how to cancel the filter:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no ipv6 pim neighbor-filter
```

## Related Commands

None

# 9.4.11 ipv6 pim register-rate-limit

## Command Purpose

Use this command to set the rate limit for pim registers.

To return the rate limit to default value, use the no form of this command.

## Command Syntax

ipv6 pim register-rate-limit *LIMIT*

no ipv6 pim register-rate-limit

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LIMIT | The rate limit for pim registers send from DR to RP | 1-65535 |

## Command Mode

Global Configuration

## Default

By default, will not limit PIM register messages, if a limit is set, PIM register messages will be discard when pakcet reached by this limit.

## Usage

There is no rate limit for pim registers by default.

When the rate limit is configured, the exceed pim register message will be dropped on the rp.

## Examples

This example shows how to set the rate limit for pim registers to 100 per second:

```
Switch# configure terminal
Switch(config)# ipv6 pim register-rate-limit 100
```

This example shows how to cancel the rate limit:

```
Switch# configure terminal
Switch(config)# no ipv6 pim register-rate-limit
```

## Related Commands

ipv6 pim register-rp-reachability

ipv6 pim register-source

ipv6 pim register-suppression

# 9.4.12 ipv6 pim register-source

## Command Purpose

Use this command to set the source address for pim register.

To return the source address for pim register to default value, use the no form of this command.

## Command Syntax

ipv6 pim register-source *IFNAME*

no ipv6 pim register-source

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | The name of the interface. Use the address of this interface to be the source address for pim register | Support physical/aggregation/loop back/vlan/tunnel ports |

## Command Mode

Global Configuration

## Default

The source address for pim register is the interface ipv6 address of dr by default.

## Usage

None

## Examples

This example shows how to set the source address for pim register to the ipv6 address of interface eth-0-1:

```
Switch# configure terminal
Switch(config)# ipv6 pim register-source eth-0-1
```

This example shows how to return the source address for pim register to default value:

```
Switch# configure terminal
Switch(config)# no ipv6 pim register-source
```

## Related Commands

ipv6 pim register-rate-limit

ipv6 pim register-rp-reachability

ipv6 pim register-suppression

## 9.4.13 ipv6 pim register-rp-reachability

### Command Purpose

Use this command to enable rp reachability check for pim registers.

To disable this check, use the no form of this command.

### Command Syntax

ipv6 pim register-rp-reachability

no ipv6 pim register-rp-reachability

### Command Mode

Global Configuration

### Default

Disable.

### Usage

None

### Examples

This example shows how to enable rp reachability check for pim registers:

```
Switch# configure terminal
Switch(config)#ipv6 pim register-rp-reachability
```

This example shows how to disable rp reachability check for pim registers:

```
Switch# configure terminal
Switch(config)#no ipv6 pim register-rp-reachability
```

### Related Commands

ipv6 pim register-rate-limit

ipv6 pim register-source

## 9.4.14 ipv6 pim register-suppression

### Command Purpose

Use this command to set the register suppression time.

To return this time to default value, use the no form of this command.

### Command Syntax

ipv6 pim register-suppression *SECOND*

no ipv6 pim register-suppression

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SECOND | The register suppression time in seconds | 11-65535 |

### Command Mode

Global Configuration

### Default

60s

### Usage

None

### Examples

This example shows how to set the register suppression time to 100s:

```
Switch# configure terminal
Switch(config)# ipv6 pim register-suppression 100
```

This example shows how to return the register suppression time to default value:

```
Switch# configure terminal
Switch(config)# no ipv6 pim register-suppression
```

### Related Commands

ipv6 pim register-rate-limit

ipv6 pim register-rp-reachability

ipv6 pim register-source

## 9.4.15 ipv6 pim rp-address

### Command Purpose

Use this command to set the ipv6 pim rp (rendezvous point) address.

To remove it, use the no form of this command.

### Command Syntax

ipv6 pim rp-address *IPV6_ADDR* ( *LISTNAME* | override | )

no ipv6 pim rp-address *IPV6_ADDR* ( *LISTNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IPV6_ADDR | The rp address | IPv6 address |
| LISTNAME | The name of an access-list | A string with 1-20 characters |
| override | Overrides dynamically learned RP mappings | - |

### Command Mode

Global Configuration

### Default

None

### Usage

None

## Examples

This example shows how to set the pim rp address to 2001::2:

```
Switch# configure terminal
Switch(config)# ipv6 pim rp-address 2001::2
```

This example shows how to remove the rp address 2001::2:

```
Switch# configure terminal
Switch(config)# no ipv6 pim rp-address 2001::2
```

## Related Commands

ipv6 pim rp-candidate

ipv6 pim rp-register-kat

# 9.4.16 ipv6 pim rp-candidate

## Command Purpose

Use this command to set the candidate rp.

To remove the candidate rp, use the no form of this command.

## Command Syntax

ipv6 pim rp-candidate *IFNAME* ( { priority *PRIORITY* | interval *INTERVAL* | group-list *LISTNAME* } | )

no ipv6 pim rp-candidate ( *IFNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | The name of the interface to be the candidate rp | Support physical/aggregation/loop back/vlan/tunnel ports |
| PRIORITY | The Candidate-RP priority | 0-255 |
| INTERVAL | The C-RP advertisement interval in seconds | 1-16383 |
| LISTNAME | Group ranges for this C-RP, only permit filters would be cared | A string with 1-20 characters |

## Command Mode

Global Configuration

## Default

None

## Usage

None

## Examples

This example shows how to set the interface eth-0-1 to be the candidate rp:

```
Switch# configure terminal
Switch(config)# ipv6 pim rp-candidate eth-0-1
```

This example shows how to cancel the configured candidate rp:

```
Switch# configure terminal
Switch(config)# no ipv6 pim rp-candidate eth-0-1
```

## Related Commands

ipv6 pim rp-address

# 9.4.17 ipv6 pim rp-register-kat

## Command Purpose

Use this command to set the keepalive timer (KAT) for (S,G) at RP from PIM registers.

To return this timer to default value, use the no form of this command.

## Command Syntax

ipv6 pim rp-register-kat *SECOND*

no ipv6 pim rp-register-kat

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| SECOND | The KAT time in seconds | 1-65535 |

### Command Mode

Global Configuration

### Default

185s

### Usage

The register message send from dr will add an entry on rp. This entry will be aged when the keepalive timer expired which can be configured by this command.

### Examples

This example shows how to set the keepalive timer to 100s at RP from PIM registers:

```
Switch# configure terminal
Switch(config)# ipv6 pim rp-register-kat 100
```

This example shows how to return this timer to default value:

```
Switch# configure terminal
Switch(config)# no ipv6 pim rp-register-kat
```

### Related Commands

ipv6 pim rp-address

ipv6 pim rp-candidate

## 9.4.18 ipv6 pim spt-switch-threshold infinity

### Command Purpose

Use this command to set the spt switch threshold to infinity.

To cancel this setting, use the no form of this command.

## Command Syntax

ipv6 pim spt-switch-threshold infinity ( group-list *LISTNAME* | )

no ipv6 pim spt-switch-threshold infinity ( group-list *LISTNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LISTNAME | Group address access list | A string with 1-20 characters |

## Command Mode

Global Configuration

## Default

The DR will switch to spt immediately when received the first multicast packet by default.

## Usage

None

## Examples

This example shows how to set the spt switch threshold to infinity:

```
Switch# configure terminal
Switch(config)# ipv6 pim spt-switch-threshold infinity
```

This example shows how to return the spt-switch-threshold to default:

```
Switch# configure terminal
Switch(config)# no ipv6 pim spt-switch-threshold infinity
```

## Related Commands

show ipv6 pim sparse-mode spt-threshold

# 9.4.19 ipv6 pim cisco-register-checksum

## Command Purpose

Use this command to calculate register checksum over whole packet (cisco compatibility).

To remove this setting, use the no form of this command.

## Command Syntax

ipv6 pim cisco-register-checksum ( group-list *LISTNAME* | )

no ipv6 pim cisco-register-checksum ( group-list *LISTNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LISTNAME | Group address access list | A string with 1-20 characters |

## Command Mode

Global Configuration

## Default

The register checksum defined in RFC is used by default.

## Usage

The register checksum defined in RFC is used by default,if group-list is configured, only packets that verified can be sent in CISCO way.

## Examples

This example shows how to set to calculate register checksum over whole packet:

```
Switch# configure terminal
Switch(config)# ipv6 pim cisco-register-checksum
```

This example shows how to remove this setting:

```
Switch# configure terminal
Switch(config)# no ipv6 pim cisco-register-checksum
```

### Related Commands

None

## 9.4.20 ipv6 pim sparse-mode

### Command Purpose

Use this command to enable pim sparse mode on the interface.

To disable pim sparse mode, use the no form of this command.

### Command Syntax

ipv6 pim sparse-mode ( passive | )

no ipv6 pim sparse-mode ( passive | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| passive | Pim passive mode (local members only) | - |

### Command Mode

Interface Configuration

### Default

Disable

### Usage

The pim hello message will not be sent out from the interface when the passive mode is configured.

### Examples

This example shows how to enable pim sparse mode on the interface:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ipv6 pim sparse-mode
```

This example shows how to disable pim sparse mode on the interface:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no ipv6 pim  sparse-mode
```

This example shows how to enable pim sparse mode passive on the interface:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ipv6 pim sparse-mode passive
```

### Related Commands

None

## 9.4.21 ipv6 pim unicast-bsm

### Command Purpose

Use this command to enable sending and receiving of unicast BSM for backward compatibility.

To cancel this setting, use the no form of this command.

### Command Syntax

ipv6 pim unicast-bsm

no ipv6 pim unicast-bsm

### Command Mode

Interface Configuration

### Default

Disable

### Usage

Interface will send BSM message to the whole pim domain by default.

## Examples

This example shows how to enable sending and receiving of unicast BSM for backward compatibility:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ipv6 pim unicast-bsm
```

This example shows how to cancel this setting:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no ipv6 pim unicast-bsm
```

## Related Commands

None

# 9.4.22 ipv6 pim ssm

## Command Purpose

Use this command to enable pim-ssm and set ssm group range.

To cancel this setting, use the no form of this command.

## Command Syntax

ipv6 pim ssm ( default | range *LISTNAME* )

no ipv6 pim ssm

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| default | Use FF3x::/32 group range for SSM | - |
| LISTNAME | ACL for group range to be used for SSM | A string with 1-20 characters |

## Command Mode

Global Configuration

## Default

Disable

## Usage

Enable pim-ssm and set ssm group range.

## Examples

This example shows how to enable pim-ssm and set ssm group range to default:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ipv6 pim ssm default
```

This example shows how to cancel this setting:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no ipv6 pim ssm default
```

## Related Commands

None

# 9.4.23 show ipv6 pim sparse-mode bsr-router

## Command Purpose

Use this command to show the information of bootstrap router.

## Command Syntax

show ipv6 pim sparse-mode bsr-router

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to display the information of bootstrap router:

```
Switch# show ipv6 pim sparse-mode bsr-router
PIM6v2 Bootstrap information
This system is the Bootstrap Router (BSR)
  BSR address: 2001:2::1 (?)
  Uptime:      00:00:08, BSR Priority: 64, Hash mask length: 126
  Next bootstrap message in 00:00:52
  Role: Candidate BSR
  State: Elected BSR
```

## Related Commands

None

# 9.4.24 show ipv6 pim sparse-mode interface

## Command Purpose

Use this command to show the information of pim interface.

## Command Syntax

show ipv6 pim sparse-mode interface ( detail | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| detail | Detailed interface information | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to display the information of pim interface:

```
Switch# show ipv6 pim sparse-mode interface detail
eth-0-1 (vif 0):
  Address fe80::9c7c:7eff:fe94:8300, DR fe80::9c7c:7eff:fe94:8300
  Hello period 30 seconds, Next Hello in 3 seconds
  Triggered Hello period 5 seconds
  Secondary addresses:
   2001:1::1
  Neighbors:
```

## Related Commands

None

# 9.4.25 show ipv6 pim sparse-mode local-member

## Command Purpose

Use this command to show the pim local membership information.

## Command Syntax

show ipv6 pim sparse-mode local-member ( *IFNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | Interface name | Support physical/aggregation/loopback/vlan/tunnel ports |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to display pim local membership information:

```
Switch# show ipv6 pim sparse-mode local-members
PIM Local membership information
eth-0-2:
*, ff0e::1234:5678
    info: Include
```

## Related Commands

None

# 9.4.26 show ipv6 pim sparse-mode mroute

## Command Purpose

Use this command to show the mroute information of pim sparse mode.

## Command Syntax

show ipv6 pim sparse-mode mroute ( *SRC_IPV6_ADDR* | *GROUP_IPV6_ADDR* | ) ( detail | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SRC_IPV6_ADDR | Source address | IPv6 address |
| GROUP_IPV6_ADDR | Group address | IPv6 address |
| detail | Detailed interface information | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to display pim mroute information:

```
Switch# show ipv6 pim sparse-mode mroute detail
IPv6 Multicast Routing Table
(*,*,RP) Entries: 0
(*,G) Entries: 1
(S,G) Entries: 0
(S,G,rpt) Entries: 0
FCR Entries: 0
*, ff0e::1234:5678
Type: (*,G)
Uptime: 00:01:49
  RP: ::, RPF nbr: None, RPF idx: None
  Upstream:
   State: JOINED, SPT Switch: Enabled, JT: off
   Macro state: Join Desired,
  Downstream:
   eth-0-2:
     State: NO INFO, ET: off, PPT: off
     Assert State: NO INFO, AT: off
      Winner: ::, Metric: 4294967295, Pref: 4294967295, RPT bit: on
     Macro state: Could Assert, Assert Track
  Local Olist:
   eth-0-2
```

## Related Commands

None

# 9.4.27 show ipv6 pim sparse-mode neighbor

## Command Purpose

Use this command to show the neighbor information of pim sparse mode.

## Command Syntax

show ipv6 pim sparse-mode neighbor ( ( *IFNAME* ( *IPV6_ADDR* | ) ) | detail | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | Interface name | Support physical/aggregation/loop back/vlan/tunnel ports |
| IPV6_ADDR | Neighbor address | IPv6 address |
| detail | Detailed interface information | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to display the neighbor information of pim sparse mode:

```
Switch# show ipv6 pim sparse-mode neighbor
Neighbor Address                          Interface   Uptime/Expires    DR
                                                                        Pri/Mode
fe80::9c7c:7eff:fe94:8300                 eth-0-9     00:00:40/00:01:44 1 / DR
```

## Related Commands

None

# 9.4.28 show ipv6 pim sparse-mode rp mapping

## Command Purpose

Use this command to show group to rp mappings.

## Command Syntax

show ipv6 pim sparse-mode rp mapping

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to display group to rp mappings:

```
Switch# show ipv6 pim sparse-mode rp mapping
RP: 2001:1::1
Info source: 2001:1::1, via bootstrap
```

## Related Commands

None

# 9.4.29 show ipv6 pim sparse-mode rp-hash

## Command Purpose

Use this command to show the information of rp to be chosen based on group selected.

## Command Syntax

show ipv6 pim sparse-mode rp-hash *GROUP_IPV6_ADDR*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| GROUP_IPV6_ADDR | Multicast group address | IPv6 address |

## Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to display the information of rp to be chosen based on group ff02::1234:

```
Switch# show ipv6 pim sparse-mode rp-hash ff02::1234
    RP: 2001::2
```

### Related Commands

None

## 9.4.30 show ipv6 pim sparse-mode spt-threshold

### Command Purpose

Use this command to show the rpt to spt threshold of pim sparse mode.

### Command Syntax

show ipv6 pim sparse-mode spt-threshold

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to display the rpt to spt threshold of pim sparse mode:

```
Switch# show ipv6 pim sparse-mode spt-threshold
IPv6 PIM spare-mode immediately switches over to SPT upon receiving the first tr
affic
```

### Related Commands

None

## 9.5 MVR6 Commands

### 9.5.1 mvr6

### Command Purpose

Use this command to enable or disable MVR6.To disable mvr6, use the no form of this command.

### Command Syntax

mvr6

no mvr6

### Command Mode

Global Configuration

### Default

Disable

### Usage

Enable MVR6 in the Switch, must disable ipv6 multicast-routing before enable MVR6.

### Examples

This example shows how to enable MVR6:

```
Switch# configure terminal
Switch(config)# no ipv6 multicast-routing
Switch(config)# mvr6
```

### Related Commands

show mvr6

## 9.5.2 mvr6 vlan

### Command Purpose

Use this command to specify the MVR6 source vlan.To remove this setting, use the no form of this command.

### Command Syntax

mvr6 vlan *VLAN_ID*

no mvr6 vlan

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan ID | 1-4094 |

### Command Mode

Global Configuration

### Default

None

### Usage

The related vlan interface should be created before the configuration of the MVR6 source vlan.

## Examples

This example shows how to configure source vlan of MVR6. configure vlan 2 as source vlan of MVR6:

```
Switch# configure terminal
Switch(config)# vlan database
Switch(config-vlan)# vlan 2
Switch(config)# interface vlan 2
Switch(config-if)# exit
Switch(config)# mvr6 vlan 2
```

## Related Commands

interface vlan

# 9.5.3 mvr6 group

## Command Purpose

Use this command to configure global group for MVR6.To remove this setting, use the no form of this command.

## Command Syntax

mvr6 group *IPV6_ADDR* ( *COUNT* | )

no mvr6 group address ( *COUNT* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IPV6_ADDR | Multicast group address | IPv6 Address |
| COUNT | Count of contiguous groups | 1-64 |

## Command Mode

Global Configuration

## Default

None

## Usage

This command is used to create or delete a global static group.

## Examples

This example shows how to create global static group from ff0e::1 to ff0e::50:

```
Switch# configure terminal
Switch(config)# mvr6 group ff0e::1 50
```

## Related Commands

None

# 9.5.4 mvr6 source-address

## Command Purpose

Use this command to create mvr6 source address.To reset it to default value, use the no form of this command.

## Command Syntax

mvr6 source-address *IPv6_ADDR*

no mvr6 source-address

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IPv6_ADDR | Source ipv6 address | IPv6 Address |

## Command Mode

Global Configuration

## Default

fe80::1

## Usage

None

## Examples

This example shows how to create mvr6 source address:

```
Switch# configure terminal
Switch(config)# mvr6 source-address 2001::2
```

This example shows how to resume mvr6 source address as default IPv6 address:

```
Switch# configure terminal
Switch(config)# no mvr6 source-address
```

## Related Commands

None

# 9.5.5 mvr6 type

## Command Purpose

Use this command to configure a switch-port as source port or receiver port.To remove this setting, use the no form of this command.

## Command Syntax

mvr6 type ( source | receiver vlan *VLAN_ID* )

no mvr6 type ( receiver vlan *VLAN_ID* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| source | MVR6 source port | - |
| receiver | MVR6 receiver port | - |
| VLAN_ID | MVR6 receiver vlan | 1-4094 |

## Command Mode

Interface Configuration

## Default

None

### Usage

Configure the interface as source port or receiver port. The source port must belong to source vlan, and the receiver port must not belong to source vlan.

### Examples

This example shows how to configure the eth-0-1 as source port, and configure the eth-0-2 as receiver port of vlan 2:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# mvr6 type source
Switch(config)# interface eth-0-2
Switch(config-if)# mvr6 type receiver vlan 2
```

### Related Commands

None

## 9.5.6 show mvr6

### Command Purpose

Use this command to show mvr6 information.

### Command Syntax

show mvr6

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

## Examples

This example shows how to display mrv6 information:

```
Switch# show mvr6
MVR6 Running: TRUE
MVR6 Multicast VLAN: 2
MVR6 Source-address: fe80::1
MVR6 Max Multicast Groups: 1024
MVR6 Hw Rt Limit: 224
MVR6 Current Multicast Groups: 3
```

## Related Commands

None

# 9.5.7 show mvr6 interface

## Command Purpose

Use this command to show mvr6 interface information.

## Command Syntax

show mvr6 interface

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to display mrv6 interface information:

```
Switch# show mvr6 interface
Port        Type          VLAN    Status
eth-0-2     source        10      ACTIVE
eth-0-1     receiver      11      ACTIVE
```

### Related Commands

None

## 9.5.8 show mvr6 group

### Command Purpose

Use this command to show mvr6 group learned from receiver port.

### Command Syntax

show mvr6 group vlan *VLAN_ID* ( *IPV6_ADDR* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | MVR6 receiver VLAN | 1-4094 |
| IPV6_ADDR | Multicast group address | IPv6 Address |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to display mvr6 group learned from receiver port:

```
Switch# show mvr6 groups
VLAN  Interface  Group Address                              Uptime     Expire-time
1     eth-0-3    ff0e:2111:1111:1111:1111:1111:1234:5678  00:00:11   00:04:10
```

### Related Commands

None

## 9.5.9 show mvr6 group static

### Command Purpose

Use this command to show mvr6 global static groups.

### Command Syntax

show mvr6 group static global

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to display mvr6 global static groups:

```
Switch# show mvr6 groups static global
MVR6 Static Global Group:
ff0e::1234
ff0e::1235
ff0e::1236
ff0e:2111:1111:1111:1111:1111:1234:5678
```

### Related Commands

None

## 9.5.10 show resource mvr6

### Command Purpose

Use this command to display the resource usage of MVR6.

### Command Syntax

show resource mvr6

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to display the resource usage of MVR6:

```
Switch# show resource mvr6
MVR
Resource                          Used          Capability
================================================================
MVR Entry                         4             224
L2 Mcast Member                   1             1792
```

### Related Commands

None

# 10 Traffic Management Commands

## 10.1 QOS Commands

### 10.1.1 table-map

#### Command Purpose

To create or modify a mutation map and enter the mutation configuration mode, use the mutation command. To remove a mutaiton map, use the no form of this command.

#### Command Syntax

table-map *NAME*

no table-map *NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | Name assigned to the mutation map. | The name can be a maximum of 40 characters. The name is case sensitive and can only contain alphanumeric characters, hyphens, and underscores. |

#### Command Mode

Global Configuration

#### Default

None

## Usage

You can define a mutation map for each class of qos to be used to set cos or set dscp.

## Examples

```
Switch# configure terminal
Switch(config)# table-map dscp-table
```

## Related Commands

set cos

set dscp

show table-map

# 10.1.2 map

## Command Purpose

To map from one vlaue to another one in a muation map.

## Command Syntax

map from *FROM_VALUE* [ *FROM_VALUE* ] [ *FROM_VALUE* ] [ *FROM_VALUE* ] [ *FROM_VALUE* ] [ *FROM_VALUE* ] [ *FROM_VALUE* ] [ *FROM_VALUE* ] to *TO_VALUE*

no map from *FROM_VALUE* [ *FROM_VALUE* ] [ *FROM_VALUE* ] [ *FROM_VALUE* ] [ *FROM_VALUE* ] [ *FROM_VALUE* ] [ *FROM_VALUE* ] [ *FROM_VALUE* ] to *TO_VALUE*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| FROM_VALUE | Source value | range 0-63 |
| TO_VALUE | Destination value | range 0-63 |

## Command Mode

QoS Table Map Configuration

## Default

None

## Usage

You can set the mapping value in a muation table. Set 8 vaules at most by one command and can be set repeatly.

## Examples

```
Switch# configure terminal
Switch(config)# table-map dscp-table
Switch(config-tmap)# map from 0 1 2 3 4 5 6 7 to 1
```

## Related Commands

None

# 10.1.3 default

## Command Purpose

To set the default action for unmapping value in a mutaion map.

## Command Syntax

default { *VALUE* | copy | ignore }

no default { *VALUE* | copy | ignore }

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VALUE | Set tablemap default value | range 0-63 |
| copy | Set the default behavior for value not found in the table map to copy | - |
| ignore | Set the default behavior for value not found in the table map to ignore | - |

## Command Mode

QoS Table Map Configuration

## Default

copy

## Usage

Each mutation table has only one default action.

When the default action is not copy,it will become copy when you set no command.

When the default action is copy,it will become ignore when you set no command.

## Examples

```
Switch# configure terminal
Switch(config)# table-map dscp-table
Switch(config-tmap)# default 1
Switch(config-tmap)# default copy
Switch(config-tmap)# default ignore
```

## Related Commands

None

# 10.1.4 class-map type qos

## Command Purpose

To create or modify a class map and enter the class-map configuration mode, use the class-map command. To remove a class map, use the no form of this command.

## Command Syntax

class-map type qos *NAME*

no class-map *NAME*

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| NAME | Name assigned to the class map. | The name can be a maximum of 40 characters. The name is case sensitive and can only contain alphanumeric characters, hyphens, and underscores. The name class-default is reserved. |

## Command Mode

Global Configuration

## Default

None

## Usage

You can define a class map for each class of traffic to be used in QoS policies. If the packet matches any of the criteria configured for this class map with the match command, then this class map is applied to the packet. If no execution strategy is specified (match-any or match-all), then the default value of match-any is applied to the traffic class.

## Examples

```
Switch# configure terminal
Switch(config)# policy-map type qos pmap_qos
Switch(config-pmap-qos)# class type qos cmap_qos
```

## Related Commands

class type qos

show class-map

## 10.1.5 match access-group

### Command Purpose

Use this command to configure a match criterion by referencing an access list in a class-map. To remove the access-list from a class-map, use the no form of this command.

### Command Syntax

match access-group *NAME*

no match access-group *NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | access-list name | The name can be a maximum of 40 characters. The name is case sensitive and can only contain alphanumeric characters, hyphens, and underscores. |

### Command Mode

Class-map Configuration

### Default

None

### Usage

None

### Examples

```
Switch# configure terminal
Switch(config)# class-map type qos cmap_qos
Switch(config-cmap-qos)# match access-group example
```

## Related Commands

None

# 10.1.6 match cos

## Command Purpose

To define the class of traffic using the class of service (CoS) value in class map, use the match cos command. To remove the match on the CoS value, use the no form of this command.

## Command Syntax

match cos [ inner ] *COS*

no match cos [ inner ] *COS*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| COS | Specified CoS value | 0-7 |

## Command Mode

Class-map Configuration

## Default

None

## Usage

None

## Examples

```
Switch# configure terminal
Switch(config)# class-map type qos cmap_qos
Switch(config-cmap-qos)# match cos 5
```

## Related Commands

None

# 10.1.7 match dscp

## Command Purpose

To identify specific differentiated services code point (DSCP) values as a match criterion, use the match dscp command. To remove specified DSCP values as a match criterion, use the no form of this command.

## Command Syntax

match ( ipv6 | ) dscp *DSCP_STR*

no match ( ipv6 | ) dscp *DSCP_STR*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ipv6 | Specify the parameter to match v6 packets;do not specify this parameter to match v4 packets | - |

| | | |
|---|---|---|
| DSCP_STR | Types of dscp services | af11、af12、af13、af21、af22、af23、af31、af32、af33、af41、af42、af43、cs1~cs7、default、ef<br>The corresponding values for the service type are as follows:<br>- af11：10<br>- af12：12<br>- af13：14<br>- af21：18<br>- af22：20<br>- af23：22<br>- af31：26<br>- af32：28<br>- af33：30<br>- af41：34<br>- af42：36<br>- af43：38<br>- cs1：8<br>- cs2：16<br>- cs3：24<br>- cs4：32<br>- cs5：40<br>- cs6：48<br>- cs7：56<br>- default：0<br>- ef：46 |

## Command Mode

Class-map Configuration

## Default

None

## Usage

None

## Examples

```
Switch# configure terminal
Switch(config)# class-map type qos cmap_qos
Switch(config-cmap-qos)# match dscp af11
```

### Related Commands

None

## 10.1.8 class-map type traffic-class

### Command Purpose

To create or modify a class map and enter the class-map configuration mode, use the class-map command. To remove a class map, use the no form of this command.

### Command Syntax

class-map type traffic-class *NAME*

no class-map *NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | Name assigned to the class map. | The name can be a maximum of 40 characters. The name is case sensitive and can only contain alphanumeric characters, hyphens, and underscores. The name class-default is reserved. |

### Command Mode

Global Configuration

### Default

None

### Usage

This type class-map is used to identify traffic flows with different traffic class.

### Examples

```
Switch# configure terminal
Switch(config)# class-map type traffic-class cmap_tc
```

### Related Commands

class type traffic-class

show class-map

## 10.1.9 match traffic-class

### Command Purpose

To configure a class map to use a specific QoS traffic-class value as a match criterion, use the match traffic-class command. To remove the specified protocol as match criteria, use the no form of this command.

### Command Syntax

match traffic-class *CLASS-ID*

no match traffic-class *CLASS-ID*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| CLASS-ID | Specified traffic class value . | The valid values are from 1 to 7. |

### Command Mode

Class-map Configuration

### Default

None

### Usage

None

### Examples

```
Switch# configure terminal
Switch(config)# class-map type traffic-class cmap_tc
Switch(config-cmap-tc)# match traffic-class 6
```

### Related Commands

class-map

## 10.1.10 policy-map type qos

### Command Purpose

Use this command to create a policy map. To remove the policy-map, use the no form of this command.

### Command Syntax

policy-map type qos *NAME*

no policy-map *NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | Name assigned to the policy map. | The name can be a maximum of 40 characters. The name is case sensitive and can only contain alphanumeric characters, hyphens, and underscores. |

### Command Mode

Global Configuration

### Default

None

### Usage

The policy-map can be attached to multiple physical ports at ingress directions.

### Examples

```
Switch# configure terminal
Switch(config)# policy-map type qos pmap_qos
```

### Related Commands

service-policy type qos

show policy-map

## 10.1.11 class type qos

### Command Purpose

To add a reference to an existing class map in a policy map and enter the class mode, use the class command. To remove a class from the policy map, use the no form of this command

### Command Syntax

class type qos *NAME*

no class type qos *NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | Reference to a class map. | The name can be a maximum of 40 characters. The name is case sensitive and can only contain alphanumeric characters, hyphens, and underscores. |

### Command Mode

Policy-map Configuration

### Default

None

### Usage

Policy actions in the first class that matches the traffic type are performed.

By default, the class-default class is created under every policy map in the system. You cannot change this mapping.

You cannot remove the class-default. If you attempt to delete the class-default class, the switch returns an error message.

### Examples

```
Switch# configure terminal
Switch(config)# policy-map type qos pmap_qos
Switch(config-pmap)# class type qos cmap1
```

### Related Commands

policy-map type qos

class-map type qos

## 10.1.12 class type qos class-default

### Command Purpose

To add a reference to the system default class that does not match any traffic class, use the class class-default command. To remove the system default class from the policy map, use the no form of this command.

### Command Syntax

class type qos class-default

no class type qos class-default

### Command Mode

Policy-map Configuration

### Default

None

### Usage

Traffic that fails to match any class is assigned to a default class of traffic called class-default. You cannot delete this class

## Examples

```
Switch# configure terminal
Switch(config)# policy-map type qos pmap_qos
Switch(config-pmap-qos)# class type qos class-default
```

## Related Commands

policy-map type qos

# 10.1.13 set cos

## Command Purpose

Use this command to remark packet CoS value.

## Command Syntax

set cos { [ inner ] *COS* | cos table *NAME* | dscp table *NAME* }

no set cos [ [ inner ] *COS* | cos table *NAME* | dscp table *NAME* ]

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| COS | CoS value | range 0-7 |
| NAME | Reference to a mutation map | - |

## Command Mode

Config-pmap-c Configuration

## Default

Disabled

## Usage

There are four ways to set cos.Each way can only be reset by its no command while "no set cos" command can reset all ways.

"no set cos COS" command do not care COS value.

## Examples

```
Switch# configure terminal
Switch(config)# policy-map type qos pmap_qos
Switch(config-pmap-qos)# class type qos cmap_qos
Switch(config-pmap-qos-c)# set cos 3
```

## Related Commands

None

# 10.1.14 set dscp

## Command Purpose

Use this command to mark DSCP value.

## Command Syntax

set dscp { *DSCP* | *PHB_STR* | default | dscp table *NAME* | cos table *NAME* }

no set dscp [ *DSCP* | *PHB_STR* | default | dscp table *NAME* | cos table *NAME* ]

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DSCP | DSCP value | range 0-63 |
| PHB_STR | PHB name | af11\|af12\|af13\|af21\|af22\|af23\|af31\|af32\|af33\|af41\|af42\|af43\|ef\|df\|cs1\|cs2\|cs3\|cs4\|cs5\|cs6\|cs7 |
| default | default value（000000） | - |
| NAME | Reference to a mutation map | The name can be a maximum of 40 characters. The name is case sensitive and can only contain alphanumeric characters, hyphens, and underscores. |

## Command Mode

Config-pmap-c Configuration

## Default

Disabled

## Usage

There are three ways to set dscp.Each way can only be reset by its no command while "no set dscp" command can reset all ways.

"no set dscp DSCP" command do not care DSCP value.

## Examples

```
Switch# configure terminal
Switch(config)# policy-map type qos pmap_qos
Switch(config-pmap-qos)# class type qos cmap_qos
Switch(config-pmap-qos-c)# set dscp cs3
```

## Related Commands

None

# 10.1.15 set traffic-class

## Command Purpose

Use this command to set traffic flow's class ID.

## Command Syntax

set traffic-class *CLASS-ID*

no set traffic-class

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| CLASS-ID | traffic class ID | range is 0-7 |

## Command Mode

Config-pmap-c Configuration

## Default

None

## Usage

Traffic flow with different traffic class ID would be given varieties of treatments in ingress and egress.This command has higher priority with policer set traffic-class command.

## Examples

```
Switch# configure terminal
Switch(config)# policy-map type qos pmap_qos
Switch(config-pmap-qos)# class type qos cmap_qos
Switch(config-pmap-qos-c)# set traffic-class 3
```

## Related Commands

None

# 10.1.16 set color

## Command Purpose

Use this command to set traffic flow's color.

## Command Syntax

set color { red | yellow }

no set color

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| red | red color | - |
| yellow | yellow color | - |

## Command Mode

Config-pmap-c Configuration

### Default

None

### Usage

None

### Examples

```
Switch# configure terminal
Switch(config)# policy-map type qos pmap_qos
Switch(config-pmap-qos)# class type qos cmap_qos
Switch(config-pmap-qos-c)# set color red
```

### Related Commands

None

## 10.1.17 policer

### Command Purpose

Use this command to rate-limit traffic matching this traffic class for a specified interface. To cancel rate limit, use the no form of this command.

### Command Syntax

policer { color-blind | color-aware } cir *CIR* [ cbs *CBS* ] [ eir *EBS* ] [ ebs *EBS* ] [ conform { transmit [ set-traffic-class *CLASS-ID* ] | drop } | exceed { transmit [ set-traffic-class *CLASS-ID* ] | drop } | violate { transmit [ set-traffic-class *CLASS-ID* ] | drop } ] [ statistics ]

policer pps { color-blind | color-aware } cir *CIR* [ cbs *CBS* ] [ eir *EBS* ] [ ebs *EBS* ] [ conform { transmit [ set-traffic-class *CLASS-ID* ] | drop } | exceed { transmit [ set-traffic-class *CLASS-ID* ] | drop } | violate { transmit [ set-traffic-class *CLASS-ID* ] | drop } ] [ statistics ]

no policer

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| color-blind | Do not care input packet's color | - |
| color-aware | Care input packet's color | - |
| pps | PPS mode, default is BPS mode | - |
| CIR | CIR - Commit Information Rate. | On BPS mode, the range is 0-100,000,000 kbps; On PPS mode, the range is 0-148,809,523 kbps. |
| CBS | CBS - Commit Burst Size. | On BPS mode, the range is 0-640,000 bytes, default value is 640000; On PPS mode, the range is 0-7,600 packets, default value is 4400. |
| EIR | EIR - Excess Information Rate. When eir is not set, use RFC 2697. When eir is set, use RFC 4115. | On BPS mode, the range is 0-100,000,000 kbps; On PPS mode, the range is 0-148,809,523 kbps. |
| EBS | EBS - Excess Burst Size. | On BPS mode, the range is 0-640,000 bytes, default value is 640000; On PPS mode, the range is 0-7,600 packets, default value is 4400. |
| conform | The action when the traffic not exceed C bucket. The default action is transmit | - |
| exceed | On single bucket mode, is the action when the traffic exceed C bucket.The default action is drop. On double bucket mode, is the action when the traffic exceed C bucket and not exceed E bucket, the default action is transmit | - |
| violate | On single bucekt mode, not support this action. On double bucket mode, is the action when the traffic exceed E bucket, the default action is drop. | - |
| transmit | transmit the packet | - |
| drop | drop the packet | - |

| | | |
|---|---|---|
| set-traffic-class CLASS-ID | set traffic-class for the packet | range 0-7 |
| statistics | enable policer statistics | - |

### Command Mode

Config-pmap-c Configuration

### Default

None

### Usage

Policer and aggraget-policer can not be set together in the same policy map.This command has lower priority with set traffic-class command.

### Examples

```
Switch# configure terminal
Switch(config)# policy-map type qos pmap_qos
Switch(config-pmap-qos)# class type qos cmap_qos
Switch(config-pmap-qos-c)# policer color-blind cir 50000 cbs 40000 ebs 30000
conform-action transmit exceed-action drop statistics
```

### Related Commands

show policy-map type qos statistics interface policer

show policy-map type qos statistics policer

## 10.1.18 qos aggregate-policer

### Command Purpose

Use this command to create an aggregate policer instance. The aggregate policer can be shared by multiple classes of traffic. To remove the aggregate policer instance, use the no form of this command.

## Command Syntax

qos aggregate-policer *NAME* { color-blind | color-aware } cir *CIR* [ cbs *CBS* ] [ eir *EBS* ] [ ebs *EBS* ] [ conform { transmit [ set-traffic-class *CLASS-ID* ] | drop } | exceed { transmit [ set-traffic-class *CLASS-ID* ] | drop } | violate { transmit [ set-traffic-class *CLASS-ID* ] | drop } ] [ statistics ]

qos aggregate-policer *NAME* pps { color-blind | color-aware } cir *CIR* [ cbs *CBS* ] [ eir *EBS* ] [ ebs *EBS* ] [ conform { transmit [ set-traffic-class *CLASS-ID* ] | drop } | exceed { transmit [ set-traffic-class *CLASS-ID* ] | drop } | violate { transmit [ set-traffic-class *CLASS-ID* ] | drop } ] [ statistics ]

no qos aggregate-policer *NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | Specify an aggregate-policer name | The name can be a maximum of 40 characters. The name is case sensitive and can only contain alphanumeric characters, hyphens, and underscores. |
| color-blind | Do not care input packet's color | - |
| color-aware | Care input packet's color | - |
| pps | PPS mode, default is BPS mode | - |
| CIR | CIR - Commit Information Rate. | On BPS mode, the range is 0-100,000,000 kbps;<br>On PPS mode, the range is 0-148,809,523 kbps. |
| CBS | CBS - Commit Burst Size. | On BPS mode, the range is 0-640,000 bytes, default value is 640000;<br>On PPS mode, the range is 0-7,600 packets, default value is 4400. |
| EIR | EIR - Excess Information Rate.<br>When eir is not set, use RFC 2697.<br>When eir is set, use RFC 4115. | On BPS mode, the range is 0-100,000,000 kbps;<br>On PPS mode, the range is 0-148,809,523 kbps. |

| | | |
|---|---|---|
| EBS | EBS - Excess Burst Size. | On BPS mode, the range is 0-640,000 bytes, default value is 640000;<br>On PPS mode, the range is 0-7,600 packets, default value is 4400. |
| conform | The action when the traffic not exceed C bucket. The default action is transmit | - |
| exceed | On single bucket mode, is the action when the traffic exceed C bucket.The default action is drop.<br>On double bucket mode, is the action when the traffic exceed C bucket and not exceed E bucket, the default action is transmit | - |
| violate | On single bucekt mode, not support this action.<br>On double bucket mode, is the action when the traffic exceed E bucket, the default action is drop. | - |
| transmit | transmit the packet | - |
| drop | drop the packet | - |
| set-traffic-class CLASS-ID | set traffic-class for the packet | range 0-7 |
| statistics | enable policer statistics | - |

## Command Mode

Global Configuration

## Default

None

## Usage

All the flow who use aggreagte policer will share the same bandwitdh, it is different with policer.

## Examples

```
Switch# configure terminal
Switch(config)# qos aggregate-policer example color-aware cir 1000 cbs 2000 eir
3000 ebs 4000 exceed drop statistics
```

## Related Commands

aggregate-policer

show qos aggregate-policer

# 10.1.19 aggregate-policer

## Command Purpose

Use this command to rate-limit the aggregate traffic matching this traffic class for all interfaces in the same slot. To cancel rate limit, use the no form of this command.

## Command Syntax

aggregate-policer *NAME*

no aggregate-policer

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | Aggregate policer name. | The name can be a maximum of 40 characters. The name is case sensitive and can only contain alphanumeric characters, hyphens, and underscores. |

## Command Mode

Config-pmap-c Configuration

## Default

Disabled

## Usage

Policer and aggraget-policer can not be set together in the same policy map.This command has lower priority with set traffic-class command.

## Examples

```
Switch# configure terminal
Switch(config)# policy-map type qos pmap_qos
Switch(config-pmap-qos)# class type qos cmap_qos
Switch(config-pmap-qos-c)# aggregate-policer transmit1
```

## Related Commands

qos aggregate-policer

show qos aggregate policer

# 10.1.20 policy-map type traffic-class

## Command Purpose

Use this command to create a policy map. To remove the policy-map, use the no form of this command.

## Command Syntax

policy-map traffic-class *NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | Specify a policy-map name | The name can be a maximum of 40 characters. The name is case sensitive and can only contain alphanumeric characters, hyphens, and underscores. |

## Command Mode

Global Configuration

### Default

Disabled

### Usage

This command is used to create policy map to identify traffic flows with different traffic class.

### Examples

```
Switch# configure terminal
Switch(config)# policy-map type traffic-class pmap_tc
```

### Related Commands

service-policy traffic-class

## 10.1.21 class type traffic-class

### Command Purpose

To add a reference to an existing class map in a policy map and enter the class mode, use the class command. To remove a class from the policy map, use the no form of this command.

### Command Syntax

class type traffic-class *NAME*

no class type traffic-class *NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | Reference to a class map. | The name can be a maximum of 40 characters. The name is case sensitive and can only contain alphanumeric characters, hyphens, and underscores. |

### Command Mode

Policy-map Configuration

### Default

None

### Usage

Using this command, traffic classified by traffic-class can be specified varieties of properties, such as priority, bandwidth, etc.

### Examples

```
Switch# configure terminal
Switch(config)# policy-map type traffic-class pmap_tc
Switch(config-pmap-tc)# class type traffic-class cmap_tc
```

### Related Commands

policy-map type traffic-class

class-map type traffic-class

## 10.1.22 class type traffic-class class-default

### Command Purpose

To add a reference to system default class map in a policy map and enter the class mode, use the class command. To remove a class from the policy map, use the no form of this command.

### Command Syntax

class type traffic-class class-default

no class type traffic-class class-default

### Command Mode

Policy-map Configuration

### Default

None

### Usage

Using this command, traffic classified by traffic-class can be specified varieties of properties, such as priority, bandwidth, etc.

### Examples

```
Switch# configure terminal
Switch(config)# policy-map type traffic-class pmap_tc
Switch(config-pmap-tc)# class type traffic-class class-default
```

### Related Commands

policy-map type traffic-class

## 10.1.23 priority level

### Command Purpose

To assign a strict priority level to a traffic class in a policy map, use the priority level command. To remove the mapping, use the no form of this command,

### Command Syntax

priority level *LEVEL*

no priority level

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LEVEL | Specifies the strict-priority level. | range 0-7 |

### Command Mode

Config-pmap-c Configuration

### Default

None

### Usage

When the level is the same,queues will be scheduled on WDRR mode, otherwise will be scheduled on SP mode.

### Examples

```
Switch# configure terminal
Switch(config)# policy-map type traffic-class pmap_tc
Switch(config-pmap-tc)# class type traffic-class cmap_tc
Switch(config-pmap-tc-c)# priority level 5
```

### Related Commands

show qos interface egress

## 10.1.24 bandwidth percentage

### Command Purpose

Use this command to allocate a percentage of the interface bandwidth to a queue. To remove configuration, use the no form of this command.

### Command Syntax

bandwidth percentage *PERCENTAGE*

no bandwidth percentage

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PERCENTAGE | Specifies the percentage of bandwidth of the underlying link rate. | The range is 1-100. |

### Command Mode

Config-pmap-c Configuration

### Default

None

### Usage

Total percentage of all queues is 100. Unused bandwidth is allocated to default class.

### Examples

```
Switch# configure terminal
Switch(config)# policy-map type traffic-class pmap_tc
Switch(config-pmap-tc)# class type traffic-class cmap_tc
Switch(config-pmap-tc-c)# bandwidth percentage 20
```

### Related Commands

show qos interface egress

## 10.1.25 queue-limit

### Command Purpose

Use this command to specify queue buffer.

### Command Syntax

queue-limit *SIZE* [ ecn-threshold *THRESHOLD* ]

no queue-limit

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SIZE | Queue buffer cell number, 288 bytes per cell | range 32-8192 or maximum value. |
| THRESHOLD | ECN threshold,288 bytes per cell, range 32-8191. ECN threshold default value is queue size if no set. | range 32-8191 or maximum value. |

### Command Mode

Config-pmap-c Configuration

### Default

64 buffer cells for control traffic;

256 buffer cells for non-drop traffic.

### Usage

Queue-limit，queue-limit dynamic and random-detect are conflict.

### Examples

```
Switch# configure terminal
Switch(config)# policy-map type traffic-class pmap_tc
Switch(config-pmap-tc)# class type traffic-class cmap_tc
Switch(config-pmap-tc-c)# queue-limit 200
```

### Related Commands

show qos interface egress

## 10.1.26 queue-limit dynamic

### Command Purpose

Use this command to specify dynamic buffer for queue.

### Command Syntax

queue-limit dynamic *LEVEL*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LEVEL | Queue level | range 0-10 |

### Command Mode

Config-pmap-c Configuration

## Default

10

## Usage

Queue buffer can be caculated by the following expression:

threshold = (f / (1 + f)) * remainCnt (f = 1/128 ~ 8)。

f mapping:

level factor percent of remain buffer

0 1/128 ~0.8%

1 1/64 ~1.5%

2 1/32 ~3%

3 1/16 ~6%

4 1/8 ~11%

5 1/4 20%

6 1/2 ~33%

7 1 50%

8 2 ~66%

9 4 ~80%

10 8 ~89%

Queue-limit，queue-limit dynamic and random-detect are conflict.

## Examples

```
Switch# configure terminal
Switch(config)# policy-map type traffic-class pmap_tc
Switch(config-pmap-tc)# class type traffic-class cmap_tc
Switch(config-pmap-tc-c)# queue-limit dynamic 2
```

## Related Commands

show qos interface egress

# 10.1.27 random-detect

## Command Purpose

Use this command to configure random detect parameters.

## Command Syntax

random-detect maximum-threshold *MAX* [ minimum-threshold *MIN* ] [ ecn ]

no random-detect

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MAX | maximum value in buffer cell, 288 bytes per cell | range 32-8192. |
| MIN | minimum value in buffer cell, 288 bytes per cell. MIN default value is MAX / 8 if no set. | range 32-8192. |
| ecn | enable ecn | - |

## Command Mode

Config-pmap-c Configuration

## Default

None

## Usage

Queue-limit，queue-limit dynamic and random-detect are conflict.

The real maximum queue buffer depends on the minimum of buffer threshold and buffer cell resource.

## Examples

```
Switch# configure terminal
Switch(config)# policy-map type traffic-class pmap_tc
Switch(config-pmap-tc)# class type traffic-class cmap_tc
Switch(config-pmap-tc-c)# random-detect maximum-threshold 200 ecn
```

## Related Commands

show qos interface egress

# 10.1.28 shape rate

## Command Purpose

Use this command to configure shaping for a traffic class of a physical port in absolute value mode. To remove shaping, use the no form of this command.

## Command Syntax

shape rate pir *RATE*

no shape rate

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| RATE | The value for commit information rate | range 0 - 100,000,000. |

## Command Mode

Config-pmap-c Configuration

## Default

None

## Usage

None

## Examples

```
Switch# configure terminal
Switch(config)# policy-map type traffic-class pmap_tc
Switch(config-pmap-tc)# class type traffic-class cmap_tc
Switch(config-pmap-tc-c)# shape rate pir 100000
```

## Related Commands

show qos interface egress

# 10.1.29 service-policy type qos

## Command Purpose

Use this command to apply a policy-map to member interfaces of the port group to affect the traffic classification rules. To remove the policy-map from the port group , use the no form of this command.

## Command Syntax

service-policy type qos input *NAME*

no service-policy type qos input

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | Policy-map name | The name can be a maximum of 40 characters. The name is case sensitive and can only contain alphanumeric characters, hyphens, and underscores. |

## Command Mode

Interface Configuration

Port-group Configuration

## Default

None

## Usage

None

## Examples

```
Switch# configure terminal
Switch(config)# port-group port_group_1
Switch(config-port-group)# service-policy type qos input pmap_qos
```

## Related Commands

policy-map type qos

# 10.1.30 service-policy type traffic-class

## Command Purpose

Use this command to apply a policy-map to an interface to affect the traffic queuing rules. To remove the policy-map from the interface, use the no form of this command.

## Command Syntax

service-policy type traffic-class *NAME*

no service-policy type traffic-class

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | Policy-map name | The name can be a maximum of 40 characters. The name is case sensitive and can only contain alphanumeric characters, hyphens, and underscores. |

## Command Mode

Interface Configuration

Configure-qos-global-view

## Default

None

## Usage

This command is used to apply queuing and priority-flow-control parameters on interface.

## Examples

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# service-policy type traffic-class pmap_tc
```

## Related Commands

policy-map type qos

class-map type traffic-class

# 10.1.31 qos policer

## Command Purpose

Use this command to configure a port-policer for an interface matching all traffic transmitted or received in different direction. To cancel the rate limit, use the no form of this command.

## Command Syntax

qos policer input { color-blind | color-aware } cir *CIR* [ cbs *CBS* ] [ eir *EBS* ] [ ebs *EBS* ] [ conform { transmit [ set-traffic-class *CLASS-ID* ] | drop } | exceed { transmit [ set-traffic-class *CLASS-ID* ] | drop } | violate { transmit [ set-traffic-class *CLASS-ID* ] | drop } ] [ statistics ]

qos policer input pps { color-blind | color-aware } cir *CIR* [ cbs *CBS* ] [ eir *EBS* ] [ ebs *EBS* ] [ conform { transmit [ set-traffic-class *CLASS-ID* ] | drop } | exceed { transmit [ set-traffic-class *CLASS-ID* ] | drop } | violate { transmit [ set-traffic-class *CLASS-ID* ] | drop } ] [ statistics ]

qos policer output { color-blind | color-aware } cir *CIR* [ cbs *CBS* ] [ eir *EBS* ] [ ebs *EBS* ] [ conform { transmit | drop } | exceed { transmit | drop } | violate { transmit | drop } ] [ statistics ]

qos policer output pps { color-blind | color-aware } cir *CIR* [ cbs *CBS* ] [ eir *EBS* ] [ ebs *EBS* ] [ conform { transmit | drop } | exceed { transmit | drop } | violate { transmit | drop } ] [ statistics ]

no qos policer { input | output }

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| color-blind | Do not care input packet's color | - |
| color-aware | Care input packet's color | - |
| pps | PPS mode, default is BPS mode | - |
| CIR | CIR - Commit Information Rate. | On BPS mode, the range is 0-100,000,000 kbps;<br>On PPS mode, the range is 0-148,809,523 kbps. |
| CBS | CBS - Commit Burst Size. | On BPS mode, the range is 0-640,000 bytes, default value is 640000;<br>On PPS mode, the range is 0-7,600 packets, default value is 4400. |
| EIR | EIR - Excess Information Rate.<br>When eir is not set, use RFC 2697.<br>When eir is set, use RFC 4115. | On BPS mode, the range is 0-100,000,000 kbps;<br>On PPS mode, the range is 0-148,809,523 kbps. |
| EBS | EBS - Excess Burst Size. | On BPS mode, the range is 0-640,000 bytes, default value is 640000;<br>On PPS mode, the range is 0-7,600 packets, default value is 4400. |
| conform | The action when the traffic not exceed C bucket. The default action is transmit | - |

| | | |
|---|---|---|
| exceed | On single bucket mode, is the action when the traffic exceed C bucket.The default action is drop.<br>On double bucket mode, is the action when the traffic exceed C bucket and not exceed E bucket, the default action is transmit | - |
| violate | On single bucekt mode, not support this action.<br>On double bucket mode, is the action when the traffic exceed E bucket, the default action is drop. | - |
| transmit | transmit the packet | - |
| drop | drop the packet | - |
| set-traffic-class CLASS-ID | set traffic-class for the packet | range 0-7 |
| statistics | enable policer statistics | - |

## Command Mode

Interface Configuration

## Default

None

## Usage

This command is used to configure policing on port level.

## Examples

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# qos policer input color-blind cir 50000 cbs 40000 ebs 30000
exceed drop statistics
```

## Related Commands

show qos interface statistics policer

# 10.1.32 qos shape rate

## Command Purpose

Use this command to configure shaping for a physical port in absolute value mode. To remove port shaping, use the no form of this command.

## Command Syntax

qos shape rate pir *PIR* ( ecn-percentage *PERCENTAGE* | )

no qos shape rate

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| RATE | Shaping rate | range 0 - 100,000,0000. |
| PERCENTAGE | ECN percentage value | 50%-100% |

## Command Mode

Interface Configuration

## Default

None

## Usage

In port shaping configuration, the larger the PIR value is, the better the ECN marking effect is.

## Examples

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# qos shape rate 1000
```

## Related Commands

None

# 10.1.33 show table-map

## Command Purpose

Use this command to show mutation table information.

## Command Syntax

show table-map *NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | Mutation map's name | The name can be a maximum of 40 characters. The name is case sensitive and can only contain alphanumeric characters, hyphens, and underscores. |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

```
Switch# show table-map dscp-table
table-map dscp-table
 map from 4 to 3
 default copy
```

## Related Commands

table-map

# 10.1.34 show class-map

## Command Purpose

Use this command to show class map information.

## Command Syntax

show class-map [ *NAME* ]

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | Class map's name | The name can be a maximum of 40 characters. The name is case sensitive and can only contain alphanumeric characters, hyphens, and underscores. |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

```
Switch# show class-map cos1
    CLASS-MAP-NAME: cos1 (qos)
      match cos 1
```

## Related Commands

class-map type qos

# 10.1.35 show policy-map

## Command Purpose

Use this command to show policy map information.

## Command Syntax

show policy-map [ *NAME* ]

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | Policy map's name | The name can be a maximum of 40 characters. The name is case sensitive and can only contain alphanumeric characters, hyphens, and underscores. |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

```
Switch# show policy-map q1
  POLICY-MAP-NAME: q1 (qos)
    State: attached

    CLASS-MAP-NAME: cos0
      match cos 0
        set traffic-class       : 7
        statistics  : enable
policer color-aware cir 10000000 cbs 640000 ebs 640000 statistics
```

## Related Commands

policy-map type qos

# 10.1.36 show policy-map applied-record

## Command Purpose

Use this command to show application records of the policy map.

## Command Syntax

show policy-map applied-record ( *NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | Policy map's name | The name can be a maximum of 41 characters. The name is case sensitive and can only contain alphanumeric characters, hyphens, and underscores. |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

```
Switch#   show policy-map applied-record  pmap1
Total records : 4
-------------------------------------------------------------------------------
-----------------------
Policy Type/Name                                Apply Parameter
-------------------------------------------------------------------------------
```

```
-----------------------
pmap1                                                    eth-0-1(IN)
```

## Related Commands

show policy-map

# 10.1.37 show qos aggregate-policer

## Command Purpose

Use this command to show aggregator-policer information.

## Command Syntax

show qos aggregator-policer *NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | aggregate policer name | The name can be a maximum of 40 characters. The name is case sensitive and can only contain alphanumeric characters, hyphens, and underscores. |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

```
Switch# show qos aggregate-policer example
Aggreate policer: test
  color blind
```

```
CIR 1000 kbps, CBS 640000 bytes, EBS 640000 bytes
drop violate packets
```

### Related Commands

aggregate-policer

## 10.1.38 show qos interface ingress

### Command Purpose

Use this command to show interface ingress information.

### Command Syntax

show qos interface *NAME* ingress { cos-policy | inner-cos-policy | dscp-policy | acl-policy }

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | interface name | Support physical/aggregation/vlan ports |
| cos-policy | show cos mapping information | - |
| inner-cos-policy | show inner cos mapping information | - |
| dscp-policy | show dscp mapping information | - |
| acl-policy | show acl mapping information | - |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

## Examples

```
Switch# show qos interface eth-0-1 ingress cos-policy
CoS                  TC         Color      Mark-Type  Mark-Value
0                    0          green      -          -
1                    1          green      -          -
2                    2          green      -          -
3                    3          green      -          -
4                    4          green      -          -
5                    5          green      -          -
6                    6          green      -          -
7                    7          green      -          -
```

## Related Commands

service-policy type qos

service-policy type traffic-class

# 10.1.39 show qos interface egress

## Command Purpose

Use this command to show interface egress information.

## Command Syntax

show qos interface *IFNAME* egress

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | interface name | Support physical/aggregation/vlan ports |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

```
Switch# show qos interface eth-0-1 egress
TC Priority Bandwidth Shaping(kbps) Drop-Mode   Queue-Limit(Max/Min) ECN
0  0        Remaining -             dynamic     level 0              -
1  1        -         -             dynamic     level 0              -
2  2        -         -             dynamic     level 0              -
3  3        -         -             dynamic     level 0              -
4  4        -         -             dynamic     level 0              -
5  5        -         -             dynamic     level 0              -
6  6        -         -             dynamic     level 0              -
7  7        -         -             tail-drop   64                   -
```

## Related Commands

service-policy type qos

# 10.1.40 show qos aggregate-policer statistics

## Command Purpose

Use this command to show aggregator-policer's statistics information.

## Command Syntax

show qos aggregator-policer *NAME* statistics

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | aggregate policer name | The name can be a maximum of 40 characters. The name is case sensitive and can only contain alphanumeric characters, hyphens, and underscores. |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

```
Switch# show qos aggregate-policer example statistics
  Aggreate policer: example
    rfc2697    bps    color-aware
    CIR 1000000 kbps, CBS 640000 bytes, EBS 640000 bytes
    Conform packets transmit
    Exceed packets transmit
    Violate packets drop
  Statistics:
    Type    Packets             Bytes               Action
    Conform 0                   0                   Transmit
    Exceed  0                   0                   Transmit
    Violate 0                   0                   Drop
    Total   0                   0                   -
```

## Related Commands

service-policy type traffic-class

# 10.1.41 show policy-map type qos statistics interface ace

## Command Purpose

Use this command to show the ace statistics of policy-map on interface.

## Command Syntax

show policy-map type qos statistics interface *NAME* input ace ( ace-based | class-based | ) ( class *CMAP-NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | interface name | - |
| input | The statistics of input direction will be shown | - |

| | | |
|---|---|---|
| ace-based | The statistics of matching ace will be shown | - |
| class-based | statistics of class-map will be shown | - |
| CMAP-NAME | statistics of the specified class-map can be shown | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

Using this command, the flow policer stats can be shown when class-based is specified and flow policer stats is enabled.

The statistics of ace-based and class-based have results only when the statistics is enabled.

## Examples

```
Switch# show policy-map type qos statistics interface eth-0-1 input ace class-based
 Interface: eth-0-1
 Input service policy type qos: q1

  Class name: cos0, operator: match-any(match 0 bytes 0)

  Class name: cos1, operator: match-any(match 0 bytes 0)

Switch# show policy-map type qos statistics interface eth-0-1 input ace ace-based
 Interface: eth-0-1
 Input service policy type qos: q1

  Class name: cos0, operator: match-any
    match cos 0 ( 0 match 0 bytes)
total 0 match 0 bytes

Class name: cos1, operator: match-any
match cos 1 ( 0 match 0 bytes)
total 0 match 0 bytes
```

## Related Commands

None

# 10.1.42 show policy-map type qos statistics vlan ace

## Command Purpose

Use this command to show the ace statistics of policy-map on vlan.

## Command Syntax

show policy-map type qos statistics vlan *VLAN_ID* input ace ( ace-based | class-based | ) ( class *CMAP-NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | VLAN ID | 1-4094 |
| input | The statistics of input direction will be shown | - |
| ace-based | The statistics of matching ace will be shown | - |
| class-based | statistics of class-map will be shown | - |
| CMAP-NAME | statistics of the specified class-map can be shown | The name can be a maximum of 40 characters. The name is case sensitive and can only contain alphanumeric characters, hyphens, and underscores. |

## Command Mode

Privileged EXEC

## Default

None

## Usage

Using this command, the flow policer stats can be shown when class-based is specified and flow policer stats is enabled.

The statistics of ace-based and class-based have results only when the statistics is enabled.

## Examples

```
Switch# show policy-map type qos statistics vlan 2 input ace class-based
 Vlan: 2
 Input service policy type qos: q1

  Class name: cos0, operator: match-any(match 0 bytes 0)

  Class name: cos1, operator: match-any(match 0 bytes 0)

Switch# show policy-map type qos statistics vlan 2 input ace ace-based
 Vlan: 2
 Input service policy type qos: q1

  Class name: cos0, operator: match-any
    match cos 0 ( 0 match 0 bytes)
total 0 match 0 bytes

Class name: cos1, operator: match-any
match cos 1 ( 0 match 0 bytes)
total 0 match 0 bytes
```

## Related Commands

service-policy type qos

service-policy type traffic-class

# 10.1.43 show policy-map type qos statistics port-group ace

## Command Purpose

Use this command to show the ace statistics of policy-map on port-group.

## Command Syntax

show policy-map type qos statistics port-group *PG_NAME* input ace ( ace-based | class-based | ) ( class *CMAP-NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PG_NAME | port-group name | Up to 32 characters |
| input | The statistics of input direction will be shown | - |
| ace-based | The statistics of matching ace will be shown | - |
| class-based | statistics of class-map will be shown | - |
| CMAP-NAME | statistics of the specified class-map can be shown | The name can be a maximum of 40 characters. The name is case sensitive and can only contain alphanumeric characters, hyphens, and underscores. |

## Command Mode

Privileged EXEC

## Default

None

## Usage

Using this command, the flow policer stats can be shown when class-based is specified and flow policer stats is enabled.

The statistics of ace-based and class-based have results only when the statistics is enabled.

## Examples

```
Switch# show policy-map type qos statistics port-group pg input ace class-based
 Port-group: pg
 Input service policy type qos: q1

  Class name: cos0, operator: match-any(match 0 bytes 0)

  Class name: cos1, operator: match-any(match 0 bytes 0)

Switch# show policy-map type qos statistics vlan 2 input ace ace-based
 Vlan: 2
 Input service policy type qos: q1
```

```
  Class name: cos0, operator: match-any
    match cos 0 ( 0 match 0 bytes)
total 0 match 0 bytes

Class name: cos1, operator: match-any
match cos 1 ( 0 match 0 bytes)
total 0 match 0 bytes
```

### Related Commands

service-policy type qos

service-policy type traffic-class

## 10.1.44 show policy-map type qos statistics vlan-group ace

### Command Purpose

Use this command to show the ace statistics of policy-map on vlan-group.

### Command Syntax

show policy-map type qos statistics vlan-group *VG_NAME* input ace ( ace-based | class-based | ) ( class *CMAP-NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VG_NAME | vlan-group name | Up to 32 characters |
| input | The statistics of input direction will be shown | - |
| ace-based | The statistics of matching ace will be shown | - |
| class-based | statistics of class-map will be shown | - |
| CMAP-NAME | statistics of the specified class-map can be shown | The name can be a maximum of 40 characters. The name is case sensitive and can only contain alphanumeric characters, hyphens, and underscores. |

### Command Mode

Privileged EXEC

## Default

None

## Usage

Using this command, the flow policer stats can be shown when class-based is specified and flow policer stats is enabled.

The statistics of ace-based and class-based have results only when the statistics is enabled.

## Examples

```
Switch# show policy-map type qos statistics vlan-group vg input ace class-based
 Vlan-group: vg
 Input service policy type qos: q1

  Class name: cos0, operator: match-any(match 0 bytes 0)

  Class name: cos1, operator: match-any(match 0 bytes 0)

Switch# show policy-map type qos statistics vlan 2 input ace ace-based
 Vlan: 2
 Input service policy type qos: q1

  Class name: cos0, operator: match-any
    match cos 0 ( 0 match 0 bytes)
total 0 match 0 bytes

Class name: cos1, operator: match-any
match cos 1 ( 0 match 0 bytes)
total 0 match 0 bytes
```

## Related Commands

service-policy type qos

service-policy type traffic-class

# 10.1.45 show policy-map type qos statistics ace

## Command Purpose

Use this command to show all the ace statistics of policy-map on interface.

## Command Syntax

show policy-map type qos statistics [ input ] ace ( ace-based | class-based | ) ( class *CMAP-NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| input | The statistics of input direction will be shown | - |
| ace-based | The statistics of matching ace will be shown | - |
| class-based | statistics of class-map will be shown | - |
| CMAP-NAME | statistics of the specified class-map can be shown | The name can be a maximum of 40 characters. The name is case sensitive and can only contain alphanumeric characters, hyphens, and underscores. |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

```
Switch# show policy-map type qos statistics input ace ace-based
 Interface: eth-0-1
 Input service policy type qos: q1

  Class name: cos0, operator: match-any
    match cos 0 (0 match 0 bytes)
    total 0 match 0 bytes

  Class name: cos1, operator: match-any
    match cos 1 (0 match 0 bytes)
    total 0 match 0 bytes
```

```
 Interface: eth-0-2
 Input service policy type qos: q1

  Class name: cos0, operator: match-any
    match cos 0 (0 match 0 bytes)
    total 0 match 0 bytes

  Class name: cos1, operator: match-any
    match cos 1 (0 match 0 bytes)
total 0 match 0 bytes

Switch# show policy-map type qos statistics input ace class-based
 Interface: eth-0-1
 Input service policy type qos: q1

  Class name: cos0, operator: match-any(match 0 bytes 0)

  Class name: cos1, operator: match-any(match 0 bytes 0)

 Interface: eth-0-2
 Input service policy type qos: q1

  Class name: cos0, operator: match-any(match 0 bytes 0)

  Class name: cos1, operator: match-any(match 0 bytes 0)
```

### Related Commands

service-policy type qos

service-policy type traffic-class

## 10.1.46 show policy-map type qos statistics interface policer

### Command Purpose

Use this command to show the policer statistics of policy-map on interface.

### Command Syntax

show policy-map type qos statistics interface *IFNAME* input policer ( class *CMAP-NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | interface name | Support physical/aggregation/vlan ports |

| | | |
|---|---|---|
| input | The statistics of input direction will be shown | - |
| CMAP-NAME | statistics of the specified class-map can be shown | The name can be a maximum of 40 characters. The name is case sensitive and can only contain alphanumeric characters, hyphens, and underscores. |

## Command Mode

Privileged EXEC

## Default

None

## Usage

The statistics have results only when the policer statistics is enabled.

## Examples

```
Switch# show policy-map type qos statistics interface eth-0-1 input policer
 Interface: eth-0-1
 Input service policy type qos: q1

  Class name: cos0, operator : match-any

  Class name: cos1, operator : match-any
    Policer(mode rfc2697, rate mode bps, CIR 10000000 kbps, CBS 640000 bytes, EBS
640000 bytes, color mode color-aware, conform transmit, exceed transmit, violate
drop)
    Conform packets 0, bytes 0
    Exceed packets 0, bytes 0
    Violate packets 0, bytes 0
```

## Related Commands

service-policy type qos

service-policy type traffic-class

# 10.1.47 show qos buffer-monitoring interface

## Command Purpose

Use this command to display the cache usage of all queues for the specified port

## Command Syntax

show qos buffer-monitoring interface *NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | Ethernet interface name | The name can be a maximum of 40 characters. The name is case sensitive and can only contain alphanumeric characters, hyphens, and underscores. |

## Command Mode

Privileged EXEC

## Default

None

## Usage

parameter description Time recording time of real-time information for congestion monitoring Queue index of the queue index BufferUsage (Cell) the real-time usage value of the queue cache in cells Percent(%) the real-time utilization of the queue cache,which is the ratio of the number of cells in the current queue to the total number of cells

## Examples

```
Switch# show qos buffer-monitoring interface eth-0-1
Time 2021-08-19 13:29:17
Globalbuffer(Cell): 16453
Queue     BufferUsage(Cell)     Usage/Global(%)
UC0                     0                     0
UC1                     0                     0
```

```
UC2                     0                       0
UC3                     0                       0
UC4                     0                       0
UC5                     0                       0
UC6                     0                       0
UC7                     0                       0
CPU_CTL             0                       0
```

## Related Commands

None

# 10.1.48 show policy-map type qos statistics vlan policer

## Command Purpose

Use this command to show the policer statistics of policy-map on vlan.

## Command Syntax

show policy-map type qos statistics vlan *VLAN_ID* input policer ( class *CMAP-NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | VLAN ID | 1-4094 |
| input | The statistics of input direction will be shown | - |
| CMAP-NAME | statistics of the specified class-map can be shown | The name can be a maximum of 40 characters. The name is case sensitive and can only contain alphanumeric characters, hyphens, and underscores. |

## Command Mode

Privileged EXEC

## Default

None

## Usage

The statistics have results only when the policer statistics is enabled.

## Examples

```
Switch# show policy-map type qos statistics vlan 2 input policer
 Vlan: 2
 Input service policy type qos: q1

  Class name: cos0, operator : match-any

  Class name: cos1, operator : match-any
    Policer(mode rfc2697, rate mode bps, CIR 10000000 kbps, CBS 640000 bytes, EBS
640000 bytes, color mode color-aware, conform transmit, exceed transmit, violate
drop)
    Conform packets 0, bytes 0
    Exceed packets 0, bytes 0
    Violate packets 0, bytes 0
```

## Related Commands

service-policy type qos

service-policy type traffic-class

# 10.1.49 show policy-map type qos statistics port-group policer

## Command Purpose

Use this command to show the policer statistics of policy-map on port-group.

## Command Syntax

show policy-map type qos statistics port-group *PG_NAME* input policer ( class *CMAP-NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PG_NAME | port-group name | Up to 32 characters |
| input | The statistics of input direction will be shown | - |

| | | |
|---|---|---|
| CMAP-NAME | statistics of the specified class-map can be shown | The name can be a maximum of 40 characters. The name is case sensitive and can only contain alphanumeric characters, hyphens, and underscores. |

## Command Mode

Privileged EXEC

## Default

None

## Usage

The statistics have results only when the policer statistics is enabled.

## Examples

```
Switch# show policy-map type qos statistics port-group pg input policer
 Port-group: pg
 Input service policy type qos: q1

  Class name: cos0, operator : match-any

  Class name: cos1, operator : match-any
    Policer(mode rfc2697, rate mode bps, CIR 10000000 kbps, CBS 640000 bytes, EBS
640000 bytes, color mode color-aware, conform transmit, exceed transmit, violate
drop)
    Conform packets 0, bytes 0
    Exceed packets 0, bytes 0
    Violate packets 0, bytes 0
```

## Related Commands

service-policy type qos

service-policy type traffic-class

# 10.1.50 show policy-map type qos statistics vlan-group policer

## Command Purpose

Use this command to show the policer statistics of policy-map on vlan-group.

## Command Syntax

show policy-map type qos statistics vlan-group *VG_NAME* input policer ( class *CMAP-NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VG_NAME | vlan-group name | Up to 32 characters |
| input | The statistics of input direction will be shown | - |
| CMAP-NAME | statistics of the specified class-map can be shown | The name can be a maximum of 40 characters. The name is case sensitive and can only contain alphanumeric characters, hyphens, and underscores. |

## Command Mode

Privileged EXEC

## Default

None

## Usage

The statistics have results only when the policer statistics is enabled.

## Examples

```
Switch# show policy-map type qos statistics vlan-group vg input policer
 Vlan-group: vg
 Input service policy type qos: q1

  Class name: cos0, operator : match-any

  Class name: cos1, operator : match-any
```

```
    Policer(mode rfc2697, rate mode bps, CIR 10000000 kbps, CBS 640000 bytes, EBS
640000 bytes, color mode color-aware, conform transmit, exceed transmit, violate
drop)
    Conform packets 0, bytes 0
    Exceed packets 0, bytes 0
    Violate packets 0, bytes 0
```

### Related Commands

service-policy type qos

service-policy type traffic-class

## 10.1.51 show policy-map type qos statistics policer

### Command Purpose

Use this command to show all the policer statistics of policy-map based on class-map.

### Command Syntax

show policy-map type qos statistics [ input ] policer ( class *CMAP-NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| input | The statistics of input direction will be shown | - |
| CMAP-NAME | statistics of the specified class-map can be shown | The name can be a maximum of 40 characters. The name is case sensitive and can only contain alphanumeric characters, hyphens, and underscores. |

### Command Mode

Privileged EXEC

### Default

None

## Usage

None

## Examples

```
Switch# show policy-map type qos statistics input policer
 Interface: eth-0-1
 Input service policy type qos: q1

  Class name: cos0, operator : match-any

  Class name: cos1, operator : match-any
    Policer(mode rfc2697, rate mode bps, CIR 10000000 kbps, CBS 640000 bytes, EBS
640000 bytes, color mode color-aware, conform transmit, exceed transmit, violate
drop)
    Conform packets 0, bytes 0
    Exceed packets 0, bytes 0
    Violate packets 0, bytes 0

 Interface: eth-0-2
 Input service policy type qos: q1

  Class name: cos0, operator : match-any

  Class name: cos1, operator : match-any
    Policer(mode rfc2697, rate mode bps, CIR 10000000 kbps, CBS 640000 bytes, EBS
640000 bytes, color mode color-aware, conform transmit, exceed transmit, violate
drop)
    Conform packets 0, bytes 0
    Exceed packets 0, bytes 0
Violate packets 0, bytes 0
```

## Related Commands

service-policy type qos

service-policy type traffic-class

# 10.1.52 show qos interface statistics policer

## Command Purpose

Use this command to display port statistics.

## Command Syntax

show qos interface *IFNAME* statistics policer ( input | output )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | Interface name | Support physical/aggregation/vlan ports |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

```
Switch# show qos interface eth-0-1 statistics policer input
 Interface: eth-0-1
  Input port policer:
    rfc2697    bps    color-aware
    CIR 2000000 kbps, CBS 640000 bytes, EBS 640000 bytes
    Conform packets transmit
    Exceed packets transmit
    Violate packets drop
  Statistics:
    Type    Packets              Bytes                Action
    Conform 0                    0                    Transmit
    Exceed  0                    0                    Transmit
    Violate 0                    0                    Drop
Total   0                   0                    -
```

## Related Commands

service-policy type qos

# 10.1.53 show qos interface statistics queue

## Command Purpose

Use this command to display the statistics of traffic class per interface.

## Command Syntax

show qos interface *IFNAME* statistics queue

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | Interface name | Support physical/aggregation/vlan ports |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

```
Switch# show qos interface eth-0-1 statistics queue
Queue     Transmit-packets     Transmit-Bytes       Drop-packets         Drop-Bytes
UC0       0                    0                    0                    0
UC1       0                    0                    0                    0
UC2       0                    0                    0                    0
UC3       0                    0                    0                    0
UC4       0                    0                    0                    0
UC5       0                    0                    0                    0
UC6       0                    0                    0                    0
UC7       0                    0                    0                    0
MC0       0                    0                    0                    0
MC1       0                    0                    0                    0
MC2       0                    0                    0                    0
MC3       0                    0                    0                    0
SPAN0     0                    0                    0                    0
```

## Related Commands

service-policy type traffic-class

# 10.1.54 clear qos aggregate-policer statistics

## Command Purpose

Use this command to clear aggregate policing statistics.

## Command Syntax

clear qos aggregate-policer *NAME* statistics

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | Aggregate policer name. | The name can be a maximum of 40 characters. The name is case sensitive and can only contain alphanumeric characters, hyphens, and underscores. |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

```
Switch# clear qos aggregate-policer example statistics
```

## Related Commands

show qos aggregate-policer statistics

## 10.1.55 clear policy-map type qos statistics interface ace

### Command Purpose

Use this command to clear the ace statistics of policy-map on interface.

### Command Syntax

clear policy-map type qos statistics interface *IFNAME* input ace

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | Interface name | Support physical/aggregation/vlan ports |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

```
Switch# clear policy-map type qos statistics interface eth-0-1 input ace
```

### Related Commands

show policy-map type qos statistics interface ace

## 10.1.56 clear policy-map type qos statistics vlan ace

### Command Purpose

Use this command to clear the ace statistics of policy-map on vlan.

## Command Syntax

clear policy-map type qos statistics vlan *VLAN_ID* input ace

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | VLAN ID | 1-4094 |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

```
Switch# clear policy-map type qos statistics vlan 2 input ace
```

## Related Commands

show policy-map type qos statistics vlan ace

# 10.1.57 clear policy-map type qos statistics port-group ace

## Command Purpose

Use this command to clear the ace statistics of policy-map on port-group.

## Command Syntax

clear policy-map type qos statistics port-group *PG_NAME* input ace

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PG_NAME | port-group name | Up to 32 characters |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

```
Switch# clear policy-map type qos statistics port-group pg input ace
```

### Related Commands

show policy-map type qos statistics port-group ace

## 10.1.58 clear policy-map type qos statistics vlan-group ace

### Command Purpose

Use this command to clear the ace statistics of policy-map on vlan-group.

### Command Syntax

clear policy-map type qos statistics vlan-group *VG_NAME* input ace

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VG_NAME | vlan-group name | Up to 32 characters |

### Command Mode

Privileged EXEC

### Default

None

## Usage

None

## Examples

```
Switch# clear policy-map type qos statistics vlan-group vg input ace
```

## Related Commands

show policy-map type qos statistics vlan-group ace

# 10.1.59 clear policy-map type qos statistics ace

## Command Purpose

Use this command to clear all the ace statistics of policy-map.

## Command Syntax

show policy-map type qos statistics [ input ] ace

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| input | The statistics of input direction will be clear | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

```
Switch# clear policy-map type qos statistics input ace
```

### Related Commands

show policy-map type qos statistics ace

## 10.1.60 clear policy-map type qos statistics interface policer

### Command Purpose

Use this command to clear the policer statistics of policy-map on interface.

### Command Syntax

clear policy-map type qos statistics interface *IFNAME* input policer

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | Interface name. | Support physical/aggregation/vlan ports |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

```
Switch# clear policy-map type qos statistics interface eth-0-1 input policer
```

### Related Commands

show policy-map type qos statistics interface policer

## 10.1.61 clear policy-map type qos statistics vlan policer

### Command Purpose

Use this command to clear the policer statistics of policy-map on vlan.

### Command Syntax

clear policy-map type qos statistics vlan *VLAN_ID* input policer

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | VLAN ID | 1-4094 |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

```
Switch# clear policy-map type qos statistics vlan 2 input policer
```

### Related Commands

show policy-map type qos statistics vlan policer

## 10.1.62 clear policy-map type qos statistics port-group policer

### Command Purpose

Use this command to clear the policer statistics of policy-map on port-group.

## Command Syntax

clear policy-map type qos statistics port-group *PG_NAME* input policer

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PG_NAME | port-group name | Up to 32 characters |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

```
Switch# clear policy-map type qos statistics port-group pg input policer
```

## Related Commands

show policy-map type qos statistics port-group policer

# 10.1.63 clear policy-map type qos statistics vlan-group policer

## Command Purpose

Use this command to clear the policer statistics of policy-map on vlan-group.

## Command Syntax

clear policy-map type qos statistics vlan-group *VG_NAME* input policer

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VG_NAME | vlan-group name | Up to 32 characters |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

```
Switch# clear policy-map type qos statistics vlan-group vg input policer
```

### Related Commands

show policy-map type qos statistics vlan-group policer

## 10.1.64 clear policy-map type qos statistics policer

### Command Purpose

Use this command to clear all the policer statistics of policy-map.

### Command Syntax

clear policy-map type qos statistics [ input ] policer

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| input | The statistics of input direction will be clear | - |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

```
Switch# clear policy-map type qos statistics input policer
```

### Related Commands

show policy-map type qos statistics policer

## 10.1.65 clear qos interface statistics policer

### Command Purpose

Use this command to clear port policer statistics.

### Command Syntax

clear qos interface *IFNAME* statistics policer ( input | output )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | Interface name. | Support physical/aggregation/vlan ports |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

```
Switch# clear qos interface eth-0-1 statistics policer input
```

### Related Commands

clear qos interface statistics policer

## 10.1.66 clear qos vlan statistics policer

### Command Purpose

Use this command to clear vlan policer statistics.

### Command Syntax

clear qos vlan *VLAN_ID* statistics policer ( input | output )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | VLAN ID | 1-4094 |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

```
Switch# clear qos vlan 2 statistics policer input
```

### Related Commands

show qos vlan statistics policer

## 10.1.67 clear qos interface statistics queue

### Command Purpose

Use this command to clear the queue statistics on specified interface.

### Command Syntax

clear qos interface *IFNAME* statistics queue

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | Interface name. | Support physical/aggregation/vlan ports |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

```
Switch# clear qos interface eth-0-1 statistics queue
```

### Related Commands

show qos interface statistics queue

## 10.1.68 flow-policer number

### Command Purpose

To set the number of policers for qos, such as normal and extend mode.

## Command Syntax

*Flow-policer* number ( normal | extend )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| normal | Normal mode supports 576 policers | - |
| extend | Extend mode supports 3064 policers | - |

## Command Mode

Global Configuration

## Default

Normal

## Usage

When reset the number of policers, it needs to save the configuration and restart the switch.

## Examples

```
Switch# configure terminal
Switch(config)# flow-policer number extend
% Configuration about flow-policer number has been stored, but cannot take effect
until the next reload.
% When setting the extend number of policers, It only supports the 10G rate of
policers, please check the rate of policers.
```

## Related Commands

show policy-map type qos statistics interface ace

# 10.1.69 show qos aggregator-policer

## Command Purpose

Use this command to show aggregator-policer information.

## Command Syntax

show qos aggregator-policer ( *NAME* | ) ( statistics | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | aggregate policer name | - |
| statistics | Show the statistics of the aggregator policer | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

This command is used to show aggregator-policer information.

## Examples

```
Switch# show qos aggregator-policer
AGGREGATOR-POLICER-NAME: agg_plc
mode rfc2697, CIR 4000 kbps, CBS 16000 bytes, EBS 16000 bytes, color blind mode,
drop color is red use-l3-length
```

## Related Commands

policer-aggregate

aggregate-policer

# 10.1.70 show policy-map statistics interface

## Command Purpose

Use this command to show the statistics of policy-map on interface.

## Command Syntax

show policy-map statistics interface *NAME* ( input | output ) ( ace-based | class-based | ) ( class *CMAP-NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | interface name | Only support physical port and aggregate port |
| input | The statistics of input direction will be shown | - |
| output | The statistics of output direction will be shown | - |
| ace-based | The statistics of matching ace will be shown | - |
| class-based | statistics of class-map will be shown | - |
| CMAP-NAME | statistics of the specified class-map can be shown | The name can be a maximum of 40 characters. The name is case sensitive and can only contain alphanumeric characters, hyphens, and underscores. |

## Command Mode

Privileged EXEC

## Default

None

## Usage

Using this command, the flow policer stats can be shown when class-based is specified and flow policer stats is enabled.

The statistics of ace-based and class-based have results only when the statistics is enabled.

## Examples

```
Switch# show policy-map statistics interface eth-0-1 input ace-based class cmap
Interface: eth-0-1
```

```
Ingress service policy: pmap
Class name: cmap, operator : match-any
access-group ipacl
10 permit any any any ( 1 match 64 bytes)
total 1 match 64 bytes
```

### Related Commands

policy-map

show policy-map

show running-config policy-map

## 10.1.71 show policy-map statistics

### Command Purpose

Use this command to show the statistics of policy-map on all interface.

### Command Syntax

show policy-map statistics ( input | output ) ( ace-based | class-based | ) ( class *CMAP-NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| input | The statistics of input direction will be shown | - |
| output | The statistics of output direction will be shown | - |
| ace-based | The statistics of matching ace will be shown | - |
| class-based | statistics of class-map will be shown | - |
| CMAP-NAME | statistics of the specified class-map can be shown | The name can be a maximum of 40 characters. The name is case sensitive and can only contain alphanumeric characters, hyphens, and underscores. |

### Command Mode

Privileged EXEC

## Default

None

## Usage

Using this command, the flow policer stats can be shown when class-based is specified and flow policer stats is enabled.

The statistics of ace-based and class-based have results only when the statistics is enabled.

## Examples

```
Switch# show policy-map statistics input ace-based
Interface: eth-0-1
Ingress service policy: pmap1
Class name: cmap1, operator : match-any
access-group acl1
10 permit any host 1.1.1.1 2.2.2.0 0.0.0.255 dscp 46 ( 0 match 0 bytes)
20 deny any any any ( 0 match 0 bytes)
access-group acl2
10 deny src-mac any dest-mac host 0000.1100.0001 vlan 100 ( 0 match 0 bytes)
20 permit src-mac any dest-mac any ( 0 match 0 bytes)
total 0 match 0 bytes
Class name: class-default, operator : match-any( 0 match 0 bytes)
total 0 match 0 bytes
Interface: eth-0-2
Ingress service policy: pmap1
Class name: cmap1, operator : match-any
access-group acl1
10 permit any host 1.1.1.1 2.2.2.0 0.0.0.255 dscp 46 ( 0 match 0 bytes)
20 deny any any any ( 0 match 0 bytes)
access-group acl2
10 deny src-mac any dest-mac host 0000.1100.0001 vlan 100 ( 0 match 0 bytes)
20 permit src-mac any dest-mac any ( 0 match 0 bytes)
total 0 match 0 bytes
Class name: class-default, operator : match-any( 0 match 0 bytes)
total 0 match 0 bytes
```

## Related Commands

policy-map

show policy-map

show running-config policy-map

# 10.1.72 show class-map

## Command Purpose

Use this command to show class-map information

## Command Syntax

show class-map ( *NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | class-map name | The name can be a maximum of 40 characters. The name is case sensitive and can only contain alphanumeric characters, hyphens, and underscores. |

## Command Mode

Privileged EXEC

## Default

None

## Usage

This command is used to show class-map information.

## Examples

```
Switch# show class-map
CLASS-MAP-NAME: class-default (match-any)
CLASS-MAP-NAME: cmap (match-any)
match access-group: macacl
CLASS-MAP-NAME: cmap2 (match-all)
```

## Related Commands

show running-config class-map

# 10.1.73 show policy-map

## Command Purpose

Use this command to show policy-map information.

## Command Syntax

show policy-map ( *NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | policy-map name | The name can be a maximum of 40 characters. The name is case sensitive and can only contain alphanumeric characters, hyphens, and underscores. |

## Command Mode

Privileged EXEC

## Default

None

## Usage

This command is used to show policy-map information.

## Examples

```
Switch# show policy-map plc_map
POLICY-MAP-NAME: plc_map
State: detached
CLASS-MAP-NAME: cmap
match access-group: macacl
mode rfc2698, CIR 1000 kbps, CBS 16000 bytes, PIR 2000 kbps, PBS 16000 bytes, color
blind mode, drop color is red
CLASS-MAP-NAME: cmap2
mode rfc2698, CIR 2000 kbps, CBS 16000 bytes, PIR 3000 kbps, PBS 16000 bytes, color
blind mode, drop color is red
```

### Related Commands

policy-map

show running-config policy-map

## 10.1.74 ipg shaping enable

### Command Purpose

Use the ipg shaping enable to let shaping calculate IPG bytes. Use the no form of this command to return to the default setting.

### Command Syntax

ipg shaping enable

no ipg shaping enable

### Command Mode

Global Configuration

### Default

Disabled

### Usage

This command can be configured on global configure mode.

### Examples

This example shows how to configure shaping to calculate IPG bytes:

```
Switch# configure terminal
Switch(config)# ipg shaping enable
```

This example shows how to disable shaping to calculate IPG bytes:

```
Switch# configure terminal
Switch(config)# no ipg shaping enable
```

### Related Commands

None

## 10.1.75 ipg policer enable

### Command Purpose

Uses the ipg policer enable to let policer calculate IPG bytes. Use the no form of this command to return to the default setting.

### Command Syntax

ipg policer enable

no ipg policer enable

### Command Mode

Global Configuration

### Default

Disabled

### Usage

This command can be configured on global configure mode and do not work on pps mode.

### Examples

This example shows how to configure policer to calculate IPG bytes:

```
Switch# configure terminal
Switch(config)# ipg policer enable
```

This example shows how to disable policer to calculate IPG bytes:

```
Switch# configure terminal
Switch(config)# no ipg policer enable
```

### Related Commands

None

## 10.1.76 smart buffer enable

### Command Purpose

Use this command to enable queue drop smart buffer globally.Use the no form of this command to disable queue drop smart buffer globally.

### Command Syntax

smart-buffer enable

no smart-buffer enable

### Command Mode

Global Configuration

### Default

Enable

### Usage

This command can be configured on global configure mode.

### Examples

This example shows how to enable the queue drop smart buffer.:

```
Switch# configure terminal
Switch(config)# smart-buffer enable
```

This example shows how to disable the queue drop smart buffer.:

```
Switch# configure terminal
Switch(config)# no smart-buffer enable
```

## Related Commands

None

# 10.1.77 qos aggregate-policer

## Command Purpose

Use this command to create an aggregate policer instance. The aggregate policer can be shared by multiple classes of traffic. To remove the aggregate policer instance, use the no form of this command.

## Command Syntax

qos aggregate-policer *NAME* mode rfc2697 ( color-blind | color-aware | ) cir *CIR-RATE* ( cbs *CBS-SIZE* | ) ( ebs *EBS-SIZE* | ) ( drop-color *COLOR* | ) ( use-l3-length | ) ) ( stats | )

qos aggregate-policer *NAME* mode rfc2698 ( color-blind | color-aware | ) cir *CIR-RATE* ( cbs *CBS-SIZE* | ) ( pir *PIR-RATE* ( pbs *PBS-SIZE* | ) ) ( drop-color *COLOR* | ) ( use-l3-length | ) ) ( stats | )

qos aggregate-policer *NAME* mode ( rfc4115 | bwp ) ( color-blind | color-aware | ) cir *CIR-RATE* ( cbs *CBS-SIZE* | ) ( eir *PIR-RATE* ( ebs *PBS-SIZE* | ) ) ( drop-color *COLOR* | ) ( use-l3-length | ) ) ( stats | )

no qos aggregate-policer *NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | Specify an aggregate-policer name | The name can be a maximum of 40 characters. The name is case sensitive and can only contain alphanumeric characters, hyphens, and underscores. |
| mode | Use rfc2697, rfc2698, rfc4115 or bwp mode | - |
| color-blind | Color blind mode policer | - |
| color-aware | Color aware mode policer | - |
| cir<br>CIR-RATE | CIR - Commit Information Rate | 0 to 10,000,000 kbps |

| | | |
|---|---|---|
| cbs<br>CBS-SIZE | CBS - Commit Burst Size | 0 to 128,000 bytes |
| eir<br>EIR-RATE | EIR-Excess Information Rate | 0 to 10,000,000 kbps |
| ebs<br>EBS-SIZE | EBS - Excess Burst Size with the range of 0 to 128,000 bytes | 0 to 128,000 bytes |
| pir<br>PIR-RATE | PIR - Peak Information Rate | 0 to 10,000,000 kbps |
| pbs<br>PBS-SIZE | PBS - Peak Burst Size | 0 to 128,000 bytes |
| drop-color<br>COLOR | drop color configuration includes yellow and red | yellow/red |
| use-l3-length | Use l3 length for policing | - |
| stats | enable policer statistics | - |

## Command Mode

Global Configuration

## Default

Disabled

## Usage

This command is used to create aggregate-policer instance. Color-blind or Color-aware, SRTCM or TRTCM can be configured.

The max number of aggregate policer and flow policer, which is configured in policy-map, is 128 per line-card.

If policer with statistics is configured, and stats are entered when the policer is created, policer statistics is working.

The statistics cannot be modified after the policer is created.

## Examples

This example shows how to create an aggregate-policer named agg_plc for SRTCM mode:

```
Switch(config)# qos aggregate-policer agg_plc mode rfc2697 color-aware cir 10000
cbs 128000 ebs 128000 drop-color red
```

Remove aggregate-policer:

```
Switch(config)# no qos aggregate-policer agg_plc
```

### Related Commands

show qos aggregator-policer

policer-aggregate

qos statistics policer

## 10.1.78 service-policy

### Command Purpose

Use this command to apply a policy-map to member interfaces (member vlan) of the port group (vlan group) to affect the traffic classification rules. To remove the policy-map from the port group (vlan group), use the no form of this command.

### Command Syntax

service-policy ( input | output ) *NAME*

no service-policy ( input | output )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | the policy-map name | The name can be a maximum of 40 characters. The name is case sensitive and can only contain alphanumeric characters, hyphens, and underscores. |
| input | apply policy-map to the inbound of member interfaces (member vlan) | - |
| output | apply policy-map to the outbound of member interfaces (member vlan) | - |

## Command Mode

Port-group Configuration

Vlan-group Configuration

## Default

None

## Usage

Use this command to apply a policy map defined by the policy-map command to the input or output of member interfaces (member vlan) of the port group (vlan group).

If the interface (vlan) has already been applied a policy-map， it cannot be added to the port group (vlan group).

## Examples

Configure a policy to ingress of member interfaces of the port group :

```
Switch# configure terminal
Switch(config)# port-group port_group_1
Switch(config-port-group)# service-policy input plc_map1
```

Remove a policy from ingress of member interfaces of the port group :

```
Switch# configure terminal
Switch(config)# port-group port_group_1
Switch(config-port-group)# no service-policy input
```

## Related Commands

policy-map

# 10.1.79 access-group

## Command Purpose

Use this command to apply a policy-map to member interfaces (member vlan) of the port group (vlan group) to affect the traffic classification rules. To remove the policy-map from the port group (vlan group), use the no form of this command.

## Command Syntax

access-group ( input | output ) *NAME*

no access-group ( input | output ) ( *NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | the policy-map name | The name can be a maximum of 40 characters. The name is case sensitive and can only contain alphanumeric characters, hyphens, and underscores. |
| input | apply access-group to the inbound of member interfaces (member vlan) | - |
| output | apply access-group to the outbound of member interfaces (member vlan) | - |

## Command Mode

Port-group Configuration

Vlan-group Configuration

## Default

None

## Usage

Use this command to apply a access-group to the input or output of member interfaces (member vlan) of the port group (vlan group).

If the interface (vlan) has already been applied a access-group , it cannot be added to the port group (vlan group).

## Examples

Configure a access-group to ingress of member interfaces of the port group :

```
Switch# configure terminal
Switch(config)# port-group port_group_1
Switch(config-port-group)# access-group input access_group1
```

Remove a access-group from ingress of member interfaces of the port group :

```
Switch# configure terminal
Switch(config)# port-group port_group_1
Switch(config-port-group)# no access-group input
```

## Related Commands

None

# 10.1.80 trust

## Command Purpose

Use this command to configure the port trust state. To return to the default value, use the no form of this command.

## Command Syntax

trust ( dscp | cos ( stag-cos | ctag-cos | ) | port )

no trust

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| dscp | Trust DSCP indicates all incoming IP packets will be assigned with the priority and color according to the packet DSCP field, and for other packets, the priority and color of that packet will be mapped the same as trust CoS. | - |

| | | |
|---|---|---|
| cos | Select which CoS will be specified for interface. The range of CoS is from 0 to 7. | - |
| ctag-cos | Trust ctag-cos indicates all incoming packets will be assigned with the priority and color according to the packet inner CoS field if the packet is double-tagged. If that packet is carried with only one VLAN tag or it is untagged, the behavior should be the same as that of trust port. | - |
| stag-cos | Trust stagc-cos indicates all incoming packets will be assigned with the priority and color according to the packet outer CoS field if the packet is double-tagged. If that packet is carried with only one VLAN tag or it is untagged, the behavior should be the same as that of trust CoS. | - |
| port | Trust port indicates all incoming packets will be assigned with the priority and color according to the port CoS value. | - |

## Command Mode

Interface Configuration

## Default

Trust the CoS value in packets.

## Usage

The port trust state is the criteria for classifying incoming packets from the port. All classified packets will be indentified with a priority and color according to the trust state. The default port trust state is trust cos.

## Examples

This example shows how to configure the trust state:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# trust dscp
```

## Related Commands

show qos interface

# 10.1.81 redirect

## Command Purpose

Use this command to redirect classified traffic to a specified interface. Use the no form of this command to cancel the redirection configuration.

## Command Syntax

redirect to interface *IFNAME*

no redirect

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | Destination interface name. | Only support physical port and aggregate port |

## Command Mode

Config-pmap-c Configuration

## Default

None

## Usage

The flow redirection is not effective when the policy-map is applied on output direction.

If a policy-map is applied on input direction of many interfaces, all classified traffic coming into these interfaces will be redirected.

The traffic matching the deny rules in policy-map should not be redirected.

### Examples

```
Switch(config)# policy-map pm1
Switch(config-pmap)# class cm1
Switch(config-pmap-c)# redirect to interface eth-0-1
Switch(config-pmap-c)# no redirect
```

### Related Commands

show policy-map

## 10.1.82 smart-buffer enable

### Command Purpose

Use this command to enable smart buffer globally. Use the no form of this command to disable smart buffer globally.

### Command Syntax

smart-buffer enable

no smart-buffer enable

### Command Mode

Global Configuration

### Default

Enabled

### Usage

If the smart buffer is enabled, the queue will adjust its queue threshold automatically according to the resource useage.

## Examples

```
Switch(config)# smart-buffer enable
```

## Related Commands

None

# 11 Security Commands

## 11.1 Port Security Commands

### 11.1.1 clear port-security address-table static

#### Command Purpose

Use this command to clear static port-security mac address table.

#### Command Syntax

clear port-security address-table static ( interface *IFNAME* | vlan *VLAN_ID* | address *MAC_ADDR* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MAC_ADDR | Clear port-security entries with specified mac address | MAC address in HHHH.HHHH.HHHH format |
| IFNAME | Clear port-security entries with specified interface name | Support physical/aggregation ports |
| VLAN_ID | Clear port-security entries with specified VLAN id | 1-4094 |

#### Command Mode

Privileged EXEC

#### Default

None

#### Usage

None

### Examples

This example shows how to clear all static port-security mac address-table:

```
Switch# clear port-security address-table static
```

This example shows how to clear static port-security mac address-table on eth-0-1:

```
Switch# clear port-security address-table static interface eth-0-1
```

### Related Commands

show mac address-table

## 11.1.2 switchport port-security

### Command Purpose

To enable port security on an interface, use the switchport port-security command. To disable port security, use the no switchport port-security command.

### Command Syntax

switchport port-security

no switchport port-security

### Command Mode

Interface Configuration

### Default

Disabled

### Usage

When disable port-security, all the port-security mac address entries which are learnt dynamically will be cleared. The static port-security mac address will be ineffective but not be cleared

## Examples

This example shows how to enable port security on an interface:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# switchport port-security
```

This example shows how to disable port security on an interface:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport port-security
```

## Related Commands

show port-security interface

# 11.1.3 switchport port-security mac-address

## Command Purpose

Use this command to add static port-security mac address.

## Command Syntax

switchport port-security mac-address ( sticky | ) *MAC_ADDR* vlan *VLAN_ID*

no switchport port-security mac-address ( sticky | ) *MAC_ADDR* vlan *VLAN_ID*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MAC_ADDR | Static port-security mac address | MAC address in HHHH.HHHH.HHHH format |
| VLAN_ID | Static port-security VLAN id | 1-4094 |

## Command Mode

Interface Configuration

## Default

None

### Usage

None

### Examples

This example shows how to configure static port-security mac address:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# switchport port-security mac-address 0.0.1 vlan 1
```

This example shows how to delete static port-security mac address:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport port-security mac-address 0.0.1 vlan 1
```

### Related Commands

show mac address-table

## 11.1.4 switchport port-security mac-address sticky

### Command Purpose

Use this command to enable the 'mac address sticky' feature on the interface. Use the 'no' form of this command to delete the configuration.

### Command Syntax

switchport port-security mac-address sticky

no switchport port-security mac-address sticky

### Command Mode

Interface Configuration

### Default

Disable

### Usage

Use this command to enable the 'mac address sticky' feature on the interface. After enabling the MAC Sticky function, the port can automatically convert dynamically learned MACs into static binding entries without the need for users to manually configure them, which can reduce user configuration work.

### Examples

Enable MAC Sticky function on interface eth-0-1.

```
Switch(config)# interface eth-0-1
Switch(config)# switchport port-security mac-address sticky
```

### Related Commands

None

## 11.1.5 switchport port-security maximum

### Command Purpose

Use this command to set the maximum of secure dynamic MAC addresses on a port. Use the no switchport port-security maximum command to return to the default settings.

### Command Syntax

switchport port-security maximum *MAXIMUM*

no switchport port-security maximum

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MAXIMUM | Maximum number of secure MAC addresses for the interface | 0-16384 |

### Command Mode

Interface Configuration

## Default

1

## Usage

If the new maximum is smaller than the current secure addresses on the interface, the configuration is rejected.

Once the secure dynamic MAC address number on the port reached the maximum number, no more address can be learnt on that port.

The maximum number 0 indicates that no dynamic secure MAC is allowed, only static secure MAC is supported.

## Examples

This example sets the maximum number of secure dynamic MAC addresses on a port:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# switchport port-security maximum 1024
```

This example restores the maximum number of secure dynamic MAC addresses on a port to default value:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport port-security maximum
```

## Related Commands

switchport port-security violation

show port-security maximum mac-num interface IFNAME

## 11.1.6 switchport port-security violation

### Command Purpose

Use this command to set the action to be taken when a security violation is detected. Use the no switchport port-security violation command to return to the default settings.

### Command Syntax

switchport port-security violation ( protect | restrict | errdisable )

no switchport port-security violation

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| protect | Discard packet silently | - |
| restrict | Discard packet and print log | - |
| errdisable | Discard packet, log and set the interface error-disabled | - |

### Command Mode

Interface Configuration

### Default

Discard packet silently

### Usage

To use this command, enable switchport port-security first

### Examples

This example sets port-security violation to discard packets silently:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# switch port-security violation protect
```

## Related Commands

switchport port-security

# 11.1.7 show port-security address-table

## Command Purpose

Use this command to show port-security mac address-table.

## Command Syntax

show port-security address-table ( static | dynamic | ) ( interface *IFNAME* | vlan *VLAN_ID* | address *MAC_ADDR* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| dynamic | Show the dynamically learnt entries | - |
| static | Show the statically configured entries | - |
| MAC_ADDR | Show the entries with specified mac address | MAC address in HHHH.HHHH.HHHH format |
| IFNAME | Show the entries with specified interface name | Support physical ports |
| VLAN_ID | Show the entries with specified VLAN id | 1-4094 |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows port-security mac address-table on the Switch:

```
Switch# show port-security address-table
          Secure Mac Address Table
------------------------------------------------------------------------
Vlan    Mac Address                          Type                        Ports
----    ---------------------    ------------------------      -----------
1       0001.00ce.ef01               SecureConfigured              eth-0-11
41     001a.a02c.a1dc                SecureConfigured              eth-0-41
```

## Related Commands

None

# 11.1.8 show port-security current mac-num interface

## Command Purpose

Use this command to show current port-security MAC number on interface.

## Command Syntax

show port-security current mac-num interface *IFNAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | Show the entries with specified interface name | Support physical ports |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

### Examples

This example shows current port-security mac-num on interface eth-0-1:

```
Switch# show port-security current mac-num interface eth-0-1
Current dynamic MAC addresses : 0
Current static MAC addresses  : 0
Current total MAC addresses   : 0
```

### Related Commands

switchport port-security maximum

show port-security maximum mac-num interface interface

## 11.1.9 show port-security interface

### Command Purpose

Use this command to show the port-security information on an interface.

### Command Syntax

show port-security interface *IFNAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | Show the entries with specified interface name | Support physical ports |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

## Examples

This example shows the port-security information on interface eth-0-1:

```
Switch# show port-security interface eth-0-1
Port Security               : disabled
Violation mode              : discard packet silence
Maximum MAC Addresses       : 1
Total MAC Addresses             : 1
Static configured MAC Addresses : 1
```

## Related Commands

None

# 11.1.10 show port-security maximum mac-num interface

## Command Purpose

Use this command to show the port-security maximum MAC number on an interface.

## Command Syntax

show port-security maximum mac-num interface *IFNAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | Show the entries with specified interface name | Support physical ports |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

### Examples

This example shows the port-security maximum mac-num on interface eth-0-1:

```
Switch# show port-security maximum mac-num interface eth-0-1
Maximum dynamic MAC addresses : 1
```

### Related Commands

switchport port-security maximum

show port-security current mac-num interface

## 11.2 Vlan Security Commands

### 11.2.1 vlan mac-limit maximum

### Command Purpose

Use this command to set maximum of mac addresses in specified vlan. Use the no vlan mac-limit maximum command to restore the default setting.

### Command Syntax

vlan *VLAN_ID* mac-limit maximum *MAXINUM*

no vlan *VLAN_ID* mac-limit maximum

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | VLAN id | 1-4094 |
| MAXINUM | maximum of mac addresses | 1-65535 |

### Command Mode

VLAN Configuration

### Default

No mac-limit on all vlans

### Usage

The vlan must be created before this command

### Examples

This example shows how to set/unset maximum of mac addresses for specified vlan:

```
Switch# configure terminal
Switch(config)# vlan database
Switch(config-vlan)# vlan 2
Switch(config-vlan)# vlan 2 mac-limit maximum 1000
Switch(config-vlan)# no vlan 2 mac-limit maximum
```

### Related Commands

show vlan-security

## 11.2.2 vlan mac-limit action

### Command Purpose

Use this command to set action for specified vlan.

Use the no vlan mac-limit action command to restore the default setting.

### Command Syntax

vlan *VLAN_ID* mac-limit action ( discard | warn | forward )

no vlan *VLAN_ID* mac-limit action

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | VLAN id | 1-4094 |
| discard | If the count of mac addresses reaches the maximum, packets with unknown source mac address from this VLAN will be discarded | - |

| | | |
|---|---|---|
| warn | If the count of mac addresses reaches the maximum, packets with unknown source mac address from this VLAN will be discarded, and warning log will be printed in syslog | - |
| forward | If the count of mac addresses reaches the maximum, all packets from this VLAN will be forwarded without neither mac learning nor warning log | - |

## Command Mode

VLAN Configuration

## Default

Forward

## Usage

The vlan must be created before this command.

## Examples

This example shows how to set/unset action for specified vlan:

```
Switch# configure terminal
Switch(config)# vlan database
Switch(config-vlan)# vlan 2
Switch(config-vlan)# vlan 2 mac-limit action warn
Switch(config-vlan)# no vlan 2 mac-limit action
```

## Related Commands

show vlan-security

## 11.2.3 vlan mac learning

### Command Purpose

Use this command to enable/disable mac learning for specified vlan.

### Command Syntax

vlan *VLAN_ID* mac learning ( enable | disable )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | VLAN id | 1-4094 |
| enable | Enable learning | - |
| disable | Disable learning | - |

### Command Mode

VLAN Configuration

### Default

Enable

### Usage

The vlan must be created before using this command.

### Examples

This example shows how to enable mac learning for specified vlan:

```
Switch# configure terminal
Switch(config)# vlan database
Switch(config-vlan)# vlan 2
Switch(config-vlan)# vlan 2 mac learning enable
```

### Related Commands

show vlan-security

## 11.2.4 show vlan-security

### Command Purpose

Use this command to show configuration about vlan security.

### Command Syntax

show vlan-security ( vlan *VLAN_ID* )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | VLAN id | 1-4094 |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to show configuration about vlan security:

```
Switch# configure terminal
Switch(config)# vlan database
Switch(config-vlan)# vlan 2
Switch(config-vlan)# vlan 2 mac-limit maximum 1000
Switch(config-vlan)# vlan 2 mac-limit action warn
Switch# show vlan-security
 Vlan learning-en  max-mac-count  cur-mac-count  action
 ------------------------------------------------------------------------------
-
 2    Enable     1000           0              Warn
```

### Related Commands

vlan mac-limit maximum

vlan mac-limit action

# 11.3 Time Range Commands

## 11.3.1 time-range

### Command Purpose

Use this command to create time range and enter time-range configuration mode.Use the no time-range command to delete the time range.

### Command Syntax

time-range *TIME-RANGE-NAME*

no time-range

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| TIME-RANGE-NAME | The name of the time range | String with up to 40 characters |

### Command Mode

Global Configuration

### Default

None

### Usage

A time range is used to determine a range of time during which a filter is effective.

### Examples

This example shows how to create a time range with the name “my-time-range”:

```
Switch# configure terminal
Switch(config)# time-range my-time-range
Switch(config-tm-range)#
```

### Related Commands

show time-range

## 11.3.2 absolute

### Command Purpose

Use this command to define the absolute time and date in time range.

### Command Syntax

absolute ( start *HH:MM:SS MONTH DAY YEAR* ) ( end *HH:MM:SS MONTH DAY YEAR* )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| start | Starting time and date | - |
| end | Ending time and date | - |
| HH:MM:SS | Starting time or Ending time | Hour,minute,second in HH:MM:SS format<br>HH is 0-23 |
| MONTH | Month | 1-12 |
| DAY | Day | 1-31(according to the month) |
| YEAR | Year | 2000-2037 |

### Command Mode

Time Range Configuration

### Default

None

### Usage

Comparing with the periodic time, choose an appropriate type.

### Examples

This example shows how to define a time range started from 11:11:00 January 1 2008 and ended by 00:00:00 May 1 2009:

```
Switch# configure terminal
Switch(config)# time-range my-time-range
Switch(config-tm-range)# absolute start 11:11:00 jun 1 2008 end 00:00:00 may 1 2009
```

### Related Commands

periodic

## 11.3.3 periodic

### Command Purpose

Use this command to define the periodic time and date in time range.

### Command Syntax

periodic *HH:MM WEEKDAY* to *HH:MM* ( *WEEKDAY* | )

periodic *HH:MM* ( weekdays | weekend | daily ) to *HH:MM*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| HH:MM | Starting time or Ending time | Hour,minute in HH:MM format<br>HH is 0-23 |
| weekdays | Monday thru Friday | - |
| weekend | Saturday and Sunday | - |
| daily | Every day of the week | - |
| WEEKDAY | Day of the week(First three letters of the weekday) | A case insensitive string of Monday - Sunday, at least 3 characters when using abbreviation. |

### Command Mode

Time Range Configuration

### Default

None

## Usage

Comparing with the absolute time, choose an appropriate type.

## Examples

This example shows how to define a time range started from 00:00 Monday and ended by 18:00 Wednesday in weekly period:

```
Switch# configure terminal
Switch(config)# time-range my-time-range
Switch(config-tm-range)# periodic 00:00 mon to 18:00 wed
```

This example shows how to define a time range started from 09:00 and ended by 17:00 every day:

```
Switch# configure terminal
Switch(config)# time-range my-time-range
Switch(config-tm-range)# periodic 09:00 daily to 17:00
```

## Related Commands

absolute

# 11.3.4 show time-range

## Command Purpose

Use this command to show the information of time-range.

## Command Syntax

show time-range ( *TIME-RANGE-NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| TIME-RANGE-NAME | the name of the time range.<br>Show all the time ranges when the name is not specified | String with up to 40 characters |

## Command Mode

Privileged EXEC

### Default

None

### Usage

If no time range is specified, all time-ranges in the system should be shown.

### Examples

This example shows how to display the information of all the time ranges:

```
Switch# show time-range
time-range range1
periodic 00:01 weekdays to 12:01
```

### Related Commands

time-range

## 11.4 ACL Commands

### 11.4.1 mac access-list

### Command Purpose

Use this command to create MAC ACL and then enter MAC ACL in global configuration mode. Use no mac access-list command to delete the MAC ACL.

### Command Syntax

mac access-list *ACL_NAME*

no mac access-list *ACL_NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ACL_NAME | The name of the MAC ACL | A string with up to 40 characters |

### Command Mode

Global Configuration

### Default

None

### Usage

If the system already has a MAC ACL with the same name, this command will enter the MAC ACL configuration mode. However, if the ACL name is used by other type of ACL, a prompt message will be shown.

When the name is not used by any ACL, this command is to create the MAC ACL firstly and then enter the MAC ACL configuration mode.

### Examples

This example shows how to create a MAC ACL named list_mac_1 and then enter the MAC ACL configuration mode:

```
Switch# configure terminal
Switch(config)# mac access-list list_mac_1
Switch(config-mac-acl)#
```

This example shows how to remove the MAC ACL named list_mac_1:

```
Switch# configure terminal
Switch(config)# no mac access-list list_mac_1
```

### Related Commands

match access-group

## 11.4.2 sequence-num

### Command Purpose

Use this command to remove a filter from MAC ACL.

### Command Syntax

no sequence-num *SEQUENCE_NUM*

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| SEQUENCE_NUM | The sequence number of a IP/MAC filter | 1-131071 |

## Command Mode

MAC ACL Configuration

IP ACL Configuration

## Default

None

## Usage

User can delete a ACL which is already attached to the class-map and used by a interface immediately.

## Examples

This example shows how to remove a filter with the sequence-num 10 from MAC ACL:

```
Switch# configure terminal
Switch(config)# mac access-list list_mac_1
Switch(config-mac-acl)# no sequence-num 10
```

This example shows how to remove a filter with the sequence-num 10 from IP ACL:

```
Switch# configure terminal
Switch(config)# ip access-list list_ip_1
Switch(config-ip-acl)# no sequence-num 10
```

## Related Commands

deny

deny tcp

deny udp

deny icmp

deny igmp

permit

permit tcp

permit udp

permit icmp

permit igmp

## 11.4.3 deny src-mac

### Command Purpose

Use this command to create a MAC filter for discarding ongoing packets matching the filter rule.

### Command Syntax

( *SEQUENCE_NUM* | ) deny src-mac ( any | *MAC_ADDR MAC_ADDR_MASK* | host *MAC_ADDR* ) ( dest-mac ( any | *MAC_ADDR MAC_ADDR_MASK* | host *MAC_ADDR* ) | ) ( untag-vlan | ( ( vlan *VLAN_ID* | ) ( cos *COS* | ) ( inner-vlan *INNER_VLAN* | ) ( inner-cos *INNER_COS* | ) ) ( protocol ( arp ( arp-op-code ) | rarp | *ETH_TYPE* mask *ETH_TYPE_MASK* ) | packet-length *OPERATOR LENGTH* | ) ( *TIME_RANGE_NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SEQUENCE_NUM | The sequence number of the filter in MAC ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| any | Any host | - |
| MAC_ADDR MAC_ADDR_MASK | The MAC address and its wildcard bits | MAC and wildcard in HHHH.HHHH.HHHH format |
| host MAC_ADDR | The host with a specified MAC address | MAC address in HHHH.HHHH.HHHH format |
| dest-mac | Destination MAC address | - |
| untag-vlan | Without vlan tag | - |
| VLAN_ID | VLAN-ID | 1-4094 |
| COS | CoS Value | 0-7 |
| INNER_VLAN | Inner VLAN-ID | 1-4094 |
| INNER_COS | Inner CoS value | 0-7 |

| | | |
|---|---|---|
| protocol | The protocol type which including ARP, RARP or Ether type | - |
| arp | ARP protocol | - |
| arp-op-code | arp-op-code | 0-65535 |
| rarp | RARP protocol | - |
| ETH_TYPE | Ether type | 0-0xFFFF |
| ETH_TYPE_MASK | Ether type mask | 0-0xFFFF |
| TIME_RANGE_NAME | The time-range used by the MAC filter | A string with up to 40 characters |
| OPERATOR | Packet length,operator including eq (equal to), lt (less than), gt (greater than), and range | eq (equal to), lt (less than), gt (greater than), and range |
| LENGTH | The length value | 64-16382 |

## Command Mode

MAC ACL Configuration

## Default

None

## Usage

An auto-generated sequence number will be assigned to the filter if the sequence-num field is not presented. The auto-generated sequence number is incremented by 10 on the maximum existing sequence number in the MAC ACL. i.e. when the maximum existing sequence number is 100, the sequence number of subsequent created MAC filter is 110. Eth-type is not supported in egress ACL.

## Examples

This example shows how to create a filter in MAC ACL to deny the packets with source MAC address 001A.A02C.A1DF:

```
Switch# configure terminal
Switch(config)# mac access-list list_mac_1
Switch(config-mac-acl)# 1 deny src-mac host 001A.A02C.A1DF
```

This example shows how to create a filter in MAC ACL to deny all the packets:

```
Switch# configure terminal
Switch(config)# mac access-list list_mac_1
Switch(config-mac-acl)# 2 deny src-mac any
```

This example shows how to create a filter in MAC ACL to deny the packet whose source MAC address is between the ranges specified:

```
Switch# configure terminal
Switch(config)# mac access-list list_mac_1
Switch(config-mac-acl)# 3 deny src-mac 001A.A02C.A1DF 001A.A02C.0000
```

### Related Commands

no sequence-num

## 11.4.4 permit src-mac

### Command Purpose

Use this command to create a MAC filter for allowing packets matching the filter rule to be delivered.

### Command Syntax

( *SEQUENCE_NUM* | ) permit src-mac ( any | *MAC_ADDR MAC_ADDR_MASK* | host *MAC_ADDR* ) ( dest-mac ( any | *MAC_ADDR MAC_ADDR_MASK* | host *MAC_ADDR* ) | ) ( untag-vlan | ( vlan *VLAN* | ) ( cos *COS* | ) ( inner-vlan *INNER_VLAN* | ) ( inner-cos *INNER_COS* | ) ) ( protocol ( arp ( arp-op-code ) | rarp | *ETH_TYPE* mask *ETH_TYPE_MASK* ) | packet-length *OPERATOR LENGTH* | ) ( *TIME_RANGE_NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SEQUENCE_NUM | The sequence number of the filter in MAC ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| any | Any host | - |
| MAC_ADDR MAC_ADDR_MASK | The MAC address and its wildcard bits | MAC and wildcard in HHHH.HHHH.HHHH format |
| host MAC_ADDR | The host with a specified MAC address | MAC address in HHHH.HHHH.HHHH format |
| dest-mac | Destination MAC address | - |
| untag-vlan | Without vlan tag | - |

| | | |
|---|---|---|
| VLAN | VLAN-ID | 1-4094 |
| COS | CoS | 0-7 |
| INNER_VLAN | Inner VLAN-ID | 1-4094 |
| INNER_COS | Inner CoS | 0-7 |
| protocol | The protocol type which including ARP, RARP or Ether type | - |
| arp | ARP protocol | - |
| arp-op-code | arp op code | 0-65535 |
| rarp | RARP protocol | - |
| ETH_TYPE | Ether type | 0-0xFFFF |
| ETH_TYPE_MASK | Ether type mask | 0-0xFFFF |
| TIME_RANGE_NAME | Specify the name of time-range used by the MAC filter | String with up to 40 characters |
| OPERATOR | Packet length,operator including eq (equal to), lt (less than), gt (greater than), and range | eq (equal to), lt (less than), gt (greater than), and range |
| LENGTH | The length value | 64-16382 |

## Command Mode

MAC ACL Configuration

## Default

None

## Usage

An auto-generated sequence number will be assigned to the filter if the sequence-num field is not presented. The auto-generated sequence number is incremented by 10 on the maximum existing sequence number in the MAC ACL. i.e. when the maximum existing sequence number is 105, the sequence number of subsequent created MAC filter is 115. Eth-type is not supported in egress ACL.

## Examples

This example shows how to create a filter in MAC ACL to permit the packets with source MAC address 001A.A02C.A1DF:

```
Switch# configure terminal
Switch(config)# mac access-list list_mac_1
Switch(config-mac-acl)# 1 permit src-mac host 001A.A02C.A1DF
```

This example shows how to create a filter in MAC ACL to permit all the packets:

```
Switch# configure terminal
Switch(config)# mac access-list list_mac_1
Switch(config-mac-acl)# 2 permit src-mac any
```

This example shows how to create a filter in MAC ACL to permit the packets with source MAC address between the ranges specified:

```
Switch# configure terminal
Switch(config)# mac access-list list_mac_1
Switch(config-mac-acl)# 3 permit src-mac 001A.A02C.A1DF 001A.A02C.0000
```

### Related Commands

no sequence-num

## 11.4.5 remark

### Command Purpose

Use this command to add remarks for the MAC ACL.

To remove remarks of the MAC ACL, use the no form of this command.

### Command Syntax

remark *REMARK*

no remark

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| REMARK | The remarks of the MAC ACL | String with up to 100 characters |

### Command Mode

MAC ACL Configuration

IP ACL Configuration

## Default

None

## Usage

The remarks are up to 100 characters. The exceed parts will not be stored and will be truncated.

## Examples

This example shows how to add a remark to describe the MAC ACL:

```
Switch# configure terminal
Switch(config)# mac access-list list_mac_1
Switch(config-mac-acl)# remark remark of List for mac
```

This example shows how to remove the remark of the MAC ACL:

```
Switch# configure terminal
Switch(config)# mac access-list list_mac_1
Switch(config-mac-acl)# no remark
```

## Related Commands

mac access-list

# 11.4.6 show access-list mac

## Command Purpose

Use this command to show the MAC ACL information.

## Command Syntax

show access-list mac ( *ACL_NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ACL_NAME | The name of the MAC ACL | String with up to 40 characters |

## Command Mode

Privileged EXEC

## Default

None

## Usage

If no mac acl are specified, all mac access-lists in the system should be shown.

## Examples

This example shows how to show the MAC ACL information:

```
Switch# show access-list mac
mac access-list list_mac_1
  10 deny src-mac host 0000.0001.0002
  20 permit src-mac any
```

## Related Commands

mac access-list

# 11.4.7 ip access-list

## Command Purpose

Use this command to create IP ACL and then enter IP ACL configuration mode.

To remove this ACL, use the no form of this command.

## Command Syntax

ip access-list *ACL_NAME*

no ip access-list *ACL_NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ACL_NAME | The name of an IP ACL | String with up to 40 characters |

## Command Mode

Global Configuration

## Default

None

## Usage

If the system already has an IP ACL with the same name, this command will enter the IP ACL configuration mode. However, if the ACL name is used by other type of ACL, a prompt message will be shown.

When the name is not used by any ACL, this command is to create the IP ACL firstly and then enter the IP ACL configuration mode.

## Examples

This example shows how to create an IP ACL named list_ipv4_1 and then enter the IP ACL configuration mode:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1
Switch(config-ip-acl)#
```

This example shows how to remove the IP ACL named list_ipv4_1:

```
Switch# configure terminal
Switch(config)# no ip access-list list_ipv4_1
```

## Related Commands

match access-group

# 11.4.8 deny

## Command Purpose

Use this command to discard ongoing IP packets matching the IP filter.

## Command Syntax

( *SEQUENCE_NUM* | ) deny ( *PROTO_NUM* | any ) ( *SRC_MAC SRC_MAC_MASK* | any | host *SRC_MAC* ) ( *DST_MAC DST_MAC_MASK* | any | host *DST_MAC* ) ( ip-precedence *PRECEDENCE* | dscp *DSCP* | ) ( ecn <0-3> | ) ( non-fragment | first-fragment | non-or-first-fragment | small-fragment | non-first-fragment ) ( routed-packet | ) ( options | ) ( packet-length *OPERATOR LENGTH* | ) ( *TIME_RANGE_NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SEQUENCE_NUM | The sequence number of the filter in IP ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| PROTO_NUM | An IP protocol number | 0-255 |
| any | Any IP protocol | - |
| SRC_MAC SRC_MAC_MASK | The source IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any source host | - |
| host SRC_MAC | The source IP address of a host | IPv4 Address |
| DST_MAC DST_MAC_MASK | The destination IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any destination host | - |
| host DST_MAC | The destination IP address of a host | IPv4 Address |
| PRECEDENCE | Match packets with given precedence value | 0-7 |
| DSCP | Match packets with given dscp value | 0-63 |
| ECN | ecn value | 0-3 |
| non-fragment | Match packets with non fragment | - |
| first-fragment | Match packets with first fragment | - |
| non-or-first-fragment | Match packets with non first fragment | - |
| small-fragment | Match packets with small fragment | - |
| non-first-fragment | Match packets with non first fragment | - |
| routed-packet | Match routed packet | - |

| | | |
|---|---|---|
| options | Match packets with IP options | - |
| TIME_RANGE_NAME | The time-range used by the filter | A string with up to 40 characters |
| OPERATOR | Packet length,operator including eq (equal to), lt (less than), gt (greater than), and range | eq (equal to), lt (less than), gt (greater than), and range |
| LENGTH | The length value | 64-16382 |

## Command Mode

IP ACL Configuration

## Default

None

## Usage

If IP address wildcard bit is provided, the IP address is logical-and in bitwise with the reverse bits of the wildcard bits. For example, 10.10.10.0 0.0.0.255 means the addresses from 10.10.10.0 to 10.10.10.255 are matched.

An auto-generated sequence number will be assigned to the filter if the sequence-num field is not presented. The auto-generated sequence number is incremented by 10 on the maximum existing sequence number in the IP ACL. i.e. when the maximum existing sequence number is 100, the sequence number of subsequent created IP filter is 110.

## Examples

This example shows how to create a filter in IP ACL to deny any IP packets:

This example shows how to create a filter in IP ACL to deny the fragment packets with the source IP addresss 1.1.1.1:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1
Switch(config-ip-acl)# 2 deny any host 1.1.1.1 any fragments
```

This example shows how to create a filter in IP ACL to deny any routed packets:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1
Switch(config-ip-acl)# 3 deny any any any routed-packet
```

### Related Commands

no sequence-num

## 11.4.9 deny tcp

### Command Purpose

Use this command to reject TCP packets matching the IP filter.

### Command Syntax

( *SEQUENCE_NUM* | ) deny tcp ( *SRC_MAC SRC_MAC_MASK* | any | host *SRC_MAC* ) ( src-port *OPERATOR SRC_PORT* | ) ( *DST_MAC DST_MAC_MASK* | any | host *DST_MAC* ) ( dst-port *OPERATOR DST_PORT* | ) ( ip-precedence *PRECEDENCE* | dscp *DSCP* | ) ( ecn <0-3> | ) ( established | ( match-any | match-all *FLAG-NAME* | ) | ) ( non-fragment | first-fragment | non-or-first-fragment | small-fragment | non-first-fragment ) ( routed-packet | ) ( options | ) ( packet-length *OPERATOR LENGTH* | ) ( *TIME_RANGE_NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SEQUENCE_NUM | The sequence number of the filter in IP ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| SRC_MAC SRC_MAC_MASK | The source IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any source host | - |
| host SRC_MAC | The source IP address of a host | IPv4 Address |
| OPERATOR SRC_PORT | Source port operator and value | Source port, the range is 0-65535. Operator including eq (equal to), lt (less than), gt (greater than), neq (not equal to) and range |
| DST_MAC DST_MAC_MASK | The destination IP address and its wildcard bits | IPv4 Address and Mask |

| | | |
|---|---|---|
| any | Any destination host | - |
| host DST_MAC | The destination IP address of a host | IPv4 Address |
| OPERATOR DST_PORT | Destination port operator and value | Destination port, the range is 0-65535. Operator including eq (equal to), lt (less than), gt (greater than), neq (not equal to) and range |
| PRECEDENCE | Match packets with given precedence value | 0-7 |
| DSCP | Match packets with given dscp value | 0-63 |
| ECN | ecn value | 0-3 |
| established | Match established connections | - |
| match-any | Match any of the flag-name | - |
| FLAG-NAME | Match all the flag-name, including ack, fin, psh, rst, syn and urg | ack, fin, psh, rst, syn and urg |
| non-fragment | Match packets with non fragment | - |
| first-fragment | Match packets with first fragment | - |
| non-or-first-fragment | Match packets with non first fragment | - |
| small-fragment | Match packets with small fragment | - |
| non-first-fragment | Match packets with non first fragment | - |
| routed-packet | Match routed packet | - |
| options | Match packets with IP options | - |
| TIME_RANGE_NAME | The time-range used by the IP filter | A string with up to 40 characters |
| OPERATOR | Packet length,operator including eq (equal to), lt (less than), gt (greater than), and range | eq (equal to), lt (less than), gt (greater than), and range |
| LENGTH | The length value | 64-16382 |

## Command Mode

IP ACL Configuration

## Default

None

## Usage

The fragments will be invalid when the layer 4 information is specified (i.e. src-port).

## Examples

This example shows how to create a filter in IP ACL to deny any TCP packets:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1
Switch(config-ip-acl)# 1 deny tcp any any
```

This example shows how to create a filter in IP ACL to deny the TCP packets with the source IP address 1.1.1.1, source port 0-100:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1
Switch(config-ip-acl)# 2 deny tcp host 1.1.1.1 src-port range 0 100 any
```

This example shows how to create a filter in IP ACL to deny any TCP packets in established TCP streams:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1
Switch(config-ip-acl)# 3 deny tcp any any established
```

This example shows how to create a filer in IP ACL to deny the TCP ACK packets with the source IP address 1.1.1.1:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1
Switch(config-ip-acl)# 4 deny tcp 10.10.10.0 0.0.0.0 any match-any ack
```

## Related Commands

no sequence-num

# 11.4.10 deny udp

## Command Purpose

Use this command to reject UDP packets matching the IP filter.

## Command Syntax

( *SEQUENCE_NUM* | ) deny udp ( *SRC_MAC SRC_MAC_MASK* | any | host *SRC_MAC* ) ( src-port *OPERATOR SRC_PORT* | ) ( *DST_MAC DST_MAC_MASK* | any | host *DST_MAC* ) ( dst-port *OPERATOR DST_PORT* | ) ( ip-precedence *PRECEDENCE* | dscp *DSCP* | ) ( ecn <0-3> | ) ( non-fragment | first-fragment | non-or-first-fragment | small-fragment | non-first-fragment ) ( routed-packet | ) ( options | ) ( packet-length *OPERATOR LENGTH* | ) ( *TIME_RANGE_NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SEQUENCE_NUM | The sequence number of the filter in IP ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| SRC_MAC SRC_MAC_MASK | The source IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any source host | - |
| host SRC_MAC | The source IP address of a host | IPv4 Address |
| OPERATOR SRC_PORT | Source port operator and value | Source port, the range is 0-65535. Operator including eq (equal to), lt (less than), gt (greater than), neq (not equal to) and range |
| DST_MAC DST_MAC_MASK | The destination IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any destination host | - |
| host DST_MAC | The destination IP address of a host | IPv4 Address |
| OPERATOR DST_PORT | Destination port operator and value | Destination port, the range is 0-65535. Operator including eq (equal to), lt (less than), gt (greater than), neq (not equal to) and range |

| | | |
|---|---|---|
| PRECEDENCE | Match packets with given precedence value | 0-7 |
| DSCP | Match packets with given dscp value | 0-63 |
| ECN | ecn value | 0-3 |
| non-fragment | Match packets with non fragment | - |
| first-fragment | Match packets with first fragment | - |
| non-or-first-fragment | Match packets with non first fragment | - |
| small-fragment | Match packets with small fragment | - |
| non-first-fragment | Match packets with non first fragment | - |
| routed-packet | Match routed packet | - |
| options | Match packets with IP options | - |
| TIME_RANGE_NAME | The time-range used by the IP filter | A string with up to 40 characters |
| OPERATOR | Packet length,operator including eq (equal to), lt (less than), gt (greater than), and range | eq (equal to), lt (less than), gt (greater than), and range |
| LENGTH | The length value | 64-16382 |

## Command Mode

IP ACL Configuration

## Default

None

## Usage

The fragments will be invalid when the layer 4 information is specified (i.e. src-port).

## Examples

This example shows how to create a filter in IP ACL to deny any UDP packets:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1
Switch(config-ip-acl)# 1 deny udp any any
```

This example shows how to create a filter in IP ACL to deny the UDP packets with the source IP 1.1.1.1, source port 10, and destination port less than 2000:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1
Switch(config-ip-acl)# 2 deny udp host 1.1.1.1 src-port eq 10 any dst-port lt 2000
```

### Related Commands

no sequence-num

## 11.4.11 deny icmp

### Command Purpose

Use this command to reject ICMP packets matching the IP filter.

### Command Syntax

( *SEQUENCE_NUM* | ) deny icmp ( *SRC_MAC SRC_MAC_MASK* | any | host *SRC_MAC* ) ( *DST_MAC DST_MAC_MASK* | any | host *DST_MAC* ) ( icmp-type *TYPE-NUM* ( icmp-code *CODE-NUM* | ) | ) ( ip-precedence *PRECEDENCE* | dscp *DSCP* | ) ( ecn <0-3> | ) ( non-fragment | first-fragment | non-or-first-fragment | small-fragment | non-first-fragment ) ( routed-packet | ) ( options | ) ( packet-length *OPERATOR LENGTH* | ) ( *TIME_RANGE_NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| TYPE-NUM | ICMP message type | 0-255 |
| CODE-NUM | ICMP message code | 0-255 |
| SEQUENCE_NUM | The sequence number of the filter in IP ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| SRC_MAC SRC_MAC_MASK | The source IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any source host | - |
| host SRC_MAC | The source IP address of a host | IPv4 Address |

| | | |
|---|---|---|
| DST_MAC DST_MAC_MASK | The destination IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any destination host | - |
| host DST_MAC | The destination IP address of a host | IPv4 Address |
| PRECEDENCE | Match packets with given precedence value | 0-7 |
| DSCP | Match packets with given dscp value | 0-63 |
| ECN | ecn value | 0-3 |
| non-fragment | Match packets with non fragment | - |
| first-fragment | Match packets with first fragment | - |
| non-or-first-fragment | Match packets with non first fragment | - |
| small-fragment | Match packets with small fragment | - |
| non-first-fragment | Match packets with non first fragment | - |
| routed-packet | Match routed packet | - |
| options | Match packets with IP options | - |
| TIME_RANGE_NAME | The time-range used by the IP filter | A string with up to 40 characters |
| OPERATOR | Packet length,operator including eq (equal to), lt (less than), gt (greater than), and range | eq (equal to), lt (less than), gt (greater than), and range |
| LENGTH | The length value | 64-16382 |

## Command Mode

IP ACL Configuration

## Default

None

## Usage

This type of filter is mostly used to reject ICMP packets.

## Examples

This example shows how to create a filter in IP ACL to deny any ICMP packets:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1
Switch(config-ip-acl)# 1 deny icmp any any
```

This example shows how to create a filter in IP ACL to deny the ICMP packets with the icmp-type 3 and icmp-code 3:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1
Switch(config-ip-acl)# 2 deny icmp any any icmp-type 3 icmp-code 3
```

## Related Commands

no sequence-num

# 11.4.12 deny igmp

## Command Purpose

Use this command to reject IGMP packets matching the IP filter.

## Command Syntax

( *SEQUENCE_NUM* | ) deny igmp ( *SRC_MAC SRC_MAC_MASK* | any | host *SRC_MAC* ) ( *DST_MAC DST_MAC_MASK* | any | host *DST_MAC* ) ( *IGMP-TYPE* | ) ( ip-precedence *PRECEDENCE* | dscp *DSCP* | ) ( ecn <0-3> | ) ( non-fragment | first-fragment | non-or-first-fragment | small-fragment | non-first-fragment ) ( routed-packet | ) ( options | ) ( packet-length *OPERATOR LENGTH* | ) ( *TIME_RANGE_NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IGMP-TYPE | IGMP type | including dvmrp, host-query, host-report, mtrace, mtrace-response, pim, precedence, trace, v2-leave, v2-report, v3-report |

| | | |
|---|---|---|
| SEQUENCE_NUM | The sequence number of the filter in IP ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| SRC_MAC SRC_MAC_MASK | The source IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any source host | - |
| host SRC_MAC | The source IP address of a host | IPv4 Address |
| DST_MAC DST_MAC_MASK | The destination IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any destination host | - |
| host DST_MAC | The destination IP address of a host | IPv4 Address |
| PRECEDENCE | Match packets with given precedence value | 0-7 |
| DSCP | Match packets with given dscp value | 0-63 |
| ECN | ecn value | 0-3 |
| non-fragment | Match packets with non fragment | - |
| first-fragment | Match packets with first fragment | - |
| non-or-first-fragment | Match packets with non first fragment | - |
| small-fragment | Match packets with small fragment | - |
| non-first-fragment | Match packets with non first fragment | - |
| routed-packet | Match routed packet | - |
| options | Match packets with IP options | - |
| TIME_RANGE_NAME | The time-range used by the IP filter | A string with up to 40 characters |
| OPERATOR | Packet length,operator including eq (equal to), lt (less than), gt (greater than), and range | eq (equal to), lt (less than), gt (greater than), and range |
| LENGTH | The length value | 64-16382 |

## Command Mode

IP ACL Configuration

## Default

None

## Usage

This type of filter is mostly used to reject IGMP packets.

## Examples

This example shows how to create a filter in IP ACL to deny any IGMP packets:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1
Switch(config-ip-acl)# 1 deny igmp any any
```

This example shows how to create a filter in IP ACL to deny the IGMP packets with the source IP address 1.1.1.1, any destination IP address and the igmp-type pim:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1
Switch(config-ip-acl)# 2 deny igmp host 1.1.1.1 any pim
```

## Related Commands

no sequence-num

# 11.4.13 deny gre

## Command Purpose

Use this command to reject GRE packets matching the IP filter.

## Command Syntax

( *SEQUENCE_NUM* | ) deny gre ( *SRC_MAC SRC_MAC_MASK* | any | host *SRC_MAC* ) ( *DST_MAC DST_MAC_MASK* | any | host *DST_MAC* ) ( key *KEY* mask *KEY-MASK* ) ( ip-precedence *PRECEDENCE* | dscp *DSCP* | ) ( ecn <0-3> | ) ( non-fragment | first-fragment | non-or-first-fragment | small-fragment | non-first-fragment ) ( routed-packet | ) ( options | ) ( packet-length *OPERATOR LENGTH* | ) ( *TIME_RANGE_NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| KEY | GRE key | 0-4294967295 |
| KEY-MASK | GRE key mask | 0-0xFFFFFFFF |
| SEQUENCE_NUM | The sequence number of the filter in IP ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| SRC_MAC SRC_MAC_MASK | The source IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any source host | - |
| host SRC_MAC | The source IP address of a host | IPv4 Address |
| DST_MAC DST_MAC_MASK | The destination IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any destination host | - |
| host DST_MAC | The destination IP address of a host | IPv4 Address |
| PRECEDENCE | Match packets with given precedence value | 0-7 |
| DSCP | Match packets with given dscp value | 0-63 |
| ECN | ecn value | 0-3 |
| non-fragment | Match packets with non fragment | - |
| first-fragment | Match packets with first fragment | - |
| non-or-first-fragment | Match packets with non first fragment | - |
| small-fragment | Match packets with small fragment | - |
| non-first-fragment | Match packets with non first fragment | - |
| routed-packet | Match routed packet | - |
| options | Match packets with IP options | - |
| TIME_RANGE_NAME | The time-range used by the IP filter | A string with up to 40 characters |
| OPERATOR | Packet length,operator including eq (equal to), lt (less than), gt (greater than), and range | eq (equal to), lt (less than), gt (greater than), and range |
| LENGTH | The length value | 64-16382 |

## Command Mode

IP ACL Configuration

## Default

None

## Usage

This type of filter is mostly used to reject GRE packets.

Please reference to command “deny” for the other parameters.

## Examples

This example shows how to create a filter in IP ACL to deny any GRE packets:

```
Switch# configure terminal
Switch(config)# ip access-list list ipv4 1
Switch(config-ip-acl)# 1 deny gre any any key 0 mask 0
```

This example shows how to create a filter in IP ACL to deny the GRE packets with the source IP address 1.1.1.1, any destination IP address and the gre key is 10:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1
Switch(config-ip-acl)# 2 deny gre host 1.1.1.1 any key 10 mask 0xffffffff
```

## Related Commands

no sequence-num

# 11.4.14 deny nvgre

## Command Purpose

Use this command to reject NVGRE packets matching the IP filter.

## Command Syntax

( *SEQUENCE_NUM* | ) deny nvgre ( *SRC_MAC SRC_MAC_MASK* | any | host *SRC_MAC* ) ( *DST_MAC DST_MAC_MASK* | any | host *DST_MAC* ) ( vsid *VSID* mask *VSID-MASK* )

( ip-precedence *PRECEDENCE* | dscp *DSCP* | ) ( ecn <0-3> | ) ( non-fragment | first-fragment | non-or-first-fragment | small-fragment | non-first-fragment ) ( routed-packet | ) ( options | ) ( packet-length *OPERATOR LENGTH* | ) ( *TIME_RANGE_NAME* | )

*Please* reference to command "deny" for the other *parameters*.

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VSID | NVGRE vsid | 0-16777215 |
| VSID-MASK | NVGRE vsid mask | 0-0xFFFFFF |
| SEQUENCE_NUM | The sequence number of the filter in IP ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| PROTO_NUM | An IP protocol number | 0-255 |
| any | Any IP protocol | - |
| SRC_MAC SRC_MAC_MASK | The source IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any source host | - |
| host SRC_MAC | The source IP address of a host | IPv4 Address |
| DST_MAC DST_MAC_MASK | The destination IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any destination host | - |
| host DST_MAC | The destination IP address of a host | IPv4 Address |
| PRECEDENCE | Match packets with given precedence value | 0-7 |
| DSCP | Match packets with given dscp value | 0-63 |
| ECN | ecn value | 0-3 |
| non-fragment | Match packets with non fragment | - |
| first-fragment | Match packets with first fragment | - |
| non-or-first-fragment | Match packets with non first fragment | - |
| small-fragment | Match packets with small fragment | - |
| non-first-fragment | Match packets with non first fragment | - |
| routed-packet | Match routed packet | - |

| | | |
|---|---|---|
| options | Match packets with IP options | - |
| TIME_RANGE_NAME | The time-range used by the IP filter | A string with up to 40 characters |
| OPERATOR | Packet length,operator including eq (equal to), lt (less than), gt (greater than), and range | eq (equal to), lt (less than), gt (greater than), and range |
| LENGTH | The length value | 64-16382 |

## Command Mode

IP ACL Configuration

## Default

None

## Usage

This type of filter is mostly used to reject NVGRE packets.

## Examples

This example shows how to create a filter in IP ACL to deny any NVGRE packets:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1
Switch(config-ip-acl)# 1 deny nvgre any any vsid 0 mask 0
```

This example shows how to create a filter in IP ACL to deny the NVGRE packets with the source IP address 1.1.1.1, any destination IP address and the nvgre vsid is 10:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1
Switch(config-ip-acl)# 2 deny gre host 1.1.1.1 any vsid 10 mask 0xffffff
```

## Related Commands

no sequence-num

# 11.4.15 permit

## Command Purpose

Use this command to permit packets matching the IP filter.

## Command Syntax

( *SEQUENCE_NUM* | ) permit ( *PROTO_NUM* | any ) ( *SRC_MAC SRC_MAC_MASK* | any | host *SRC_MAC* ) ( *DST_MAC DST_MAC_MASK* | any | host *DST_MAC* ) ( ip-precedence *PRECEDENCE* | dscp *DSCP* | ) ( ecn <0-3> | ) ( non-fragment | first-fragment | non-or-first-fragment | small-fragment | non-first-fragment ) ( routed-packet | ) ( options | ) ( packet-length *OPERATOR LENGTH* | ) ( *TIME_RANGE_NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SEQUENCE_NUM | The sequence number of the filter in IP ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| PROTO_NUM | An IP protocol number | 0-255 |
| any | Any IP protocol | - |
| SRC_MAC SRC_MAC_MASK | The source IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any source host | - |
| host SRC_MAC | The source IP address of a host | IPv4 Address |
| DST_MAC DST_MAC_MASK | The destination IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any destination host | - |
| host DST_MAC | The destination IP address of a host | IPv4 Address |
| PRECEDENCE | Match packets with given precedence value | 0-7 |
| DSCP | Match packets with given dscp value | 0-63 |
| ECN | ecn value | 0-3 |
| non-fragment | Match packets with non fragment | - |

| | | |
|---|---|---|
| first-fragment | Match packets with first fragment | - |
| non-or-first-fragment | Match packets with non first fragment | - |
| small-fragment | Match packets with small fragment | - |
| non-first-fragment | Match packets with non first fragment | - |
| routed-packet | Match routed packet | - |
| options | Match packets with IP options | - |
| TIME_RANGE_NAME | The time-range used by the IP filter | A string with up to 40 characters |
| OPERATOR | Packet length,operator including eq (equal to), lt (less than), gt (greater than), and range | eq (equal to), lt (less than), gt (greater than), and range |
| LENGTH | The length value | 64-16382 |

## Command Mode

IP ACL Configuration

## Default

None

## Usage

If IP address wildcard bits are provided, the IP address is logical-and in bitwise with the reverse bits of the wildcard bits. For example, 10.10.10.0 0.0.0.255 means the addresses from 10.10.10.0 to 10.10.10.255 are matched.

An auto-generated sequence number will be assigned to the filter if the sequence-num field is not presented. The auto-generated sequence number is incremented by 10 on the maximum existing sequence number in the IP ACL. i.e. when the maximum existing sequence number is 105, the sequence number of subsequent created IP filter is 115.

## Examples

This example shows how to create a filter in IP ACL to permit any IP packets:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1
Switch(config-ip-acl)# 2 deny gre host 1.1.1.1 any vsid 10 mask 0xffffff
```

### Related Commands

no sequence-num

## 11.4.16 permit tcp

### Command Purpose

Use this command to permit TCP packets matching the IP filter.

### Command Syntax

( *SEQUENCE_NUM* | ) permit tcp ( *SRC_MAC SRC_MAC_MASK* | any | host *SRC_MAC* ) ( src-port *OPERATOR SRC_PORT* | ) ( *DST_MAC DST_MAC_MASK* | any | host *DST_MAC* ) ( dst-port *OPERATOR DST_PORT* | ) ( ip-precedence *PRECEDENCE* | dscp *DSCP* | ) ( ecn <0-3> | ) ( established | ( match-any | match-all *FLAG-NAME* | ) | ) ( non-fragment | first-fragment | non-or-first-fragment | small-fragment | non-first-fragment ) ( routed-packet | ) ( options | ) ( packet-length *OPERATOR LENGTH* | ) ( *TIME_RANGE_NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SEQUENCE_NUM | The sequence number of the filter in IP ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| SRC_MAC SRC_MAC_MASK | The source IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any source host | - |
| host SRC_MAC | The source IP address of a host | IPv4 Address |
| OPERATOR SRC_PORT | Source port operator and value | Source port, the range is 0-65535. Operator including eq (equal to), lt (less than), gt (greater than), neq (not equal to) and range |
| DST_MAC DST_MAC_MASK | The destination IP address and its wildcard bits | IPv4 Address and Mask |

| | | |
|---|---|---|
| any | Any destination host | - |
| host DST_MAC | The destination IP address of a host | IPv4 Address |
| OPERATOR DST_PORT | Destination port operator and value | Destination port, the range is 0-65535. Operator including eq (equal to), lt (less than), gt (greater than), neq (not equal to) and range |
| PRECEDENCE | Match packets with given precedence value | 0-7 |
| DSCP | Match packets with given dscp value | 0-63 |
| ECN | ecn value | 0-3 |
| established | Match established connections | - |
| match-any | Match any of the flag-name | - |
| FLAG-NAME | Match all the flag-name, including ack, fin, psh, rst, syn and urg | ack, fin, psh, rst, syn and urg |
| non-fragment | Match packets with non fragment | - |
| first-fragment | Match packets with first fragment | - |
| non-or-first-fragment | Match packets with non first fragment | - |
| small-fragment | Match packets with small fragment | - |
| non-first-fragment | Match packets with non first fragment | - |
| routed-packet | Match routed packet | - |
| options | Match packets with IP options | - |
| TIME_RANGE_NAME | The time-range used by the IP filter | A string with up to 40 characters |
| OPERATOR | Packet length,operator including eq (equal to), lt (less than), gt (greater than), and range | eq (equal to), lt (less than), gt (greater than), and range |
| LENGTH | The length value | 64-16382 |

## Command Mode

IP ACL Configuration

## Default

None

## Usage

The fragments will be invalid when the layer 4 information is specified (i.e. src-port).

## Examples

This example shows how to create a filter in IP ACL to permit any TCP packets:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1
Switch(config-ip-acl)#  10 permit any any any
```

This example shows how to create a filter in IP ACL to permit the TCP packets with the source IP address 1.1.1.1, and source port ranges from 0 to 100:

```
Switch# configure terminal
Switch(config-ex-ip-acl)# 20 permit tcp host 1.1.1.1 any non-first-fragments
```

This example shows how to create a filter in IP ACL to permit any TCP packets in established TCP streams:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1
Switch(config-ip-acl)# 30 permit any any any routed-packet
```

This example shows how to create a filter in IP ACL to permit the TCP ACK packets with the source IP address 10.10.10.0:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1
Switch(config-ip-acl)# 4 permit tcp 10.10.10.0 0.0.0.0 any match-any ack
```

## Related Commands

no sequence-num

# 11.4.17 permit udp

## Command Purpose

Use this command to permit UDP packets when the packets match this access-list.

## Command Syntax

( *SEQUENCE_NUM* | ) permit udp ( *SRC_MAC SRC_MAC_MASK* | any | host *SRC_MAC* ) ( src-port *OPERATOR SRC_PORT* | ) ( *DST_MAC DST_MAC_MASK* | any | host *DST_MAC* ) ( dst-port *OPERATOR DST_PORT* | ) ( ip-precedence *PRECEDENCE* | dscp *DSCP* | ) ( ecn <0-3> | ) ( non-fragment | first-fragment | non-or-first-fragment | small-fragment | non-first-fragment ) ( routed-packet | ) ( options | ) ( packet-length *OPERATOR LENGTH* | ) ( *TIME_RANGE_NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SEQUENCE_NUM | The sequence number of the filter in IP ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| SRC_MAC SRC_MAC_MASK | The source IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any source host | - |
| host SRC_MAC | The source IP address of a host | IPv4 Address |
| OPERATOR SRC_PORT | Source port operator and value | Source port, the range is 0-65535. Operator including eq (equal to), lt (less than), gt (greater than), neq (not equal to) and range |
| DST_MAC DST_MAC_MASK | The destination IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any destination host | - |
| host DST_MAC | The destination IP address of a host | IPv4 Address |
| OPERATOR DST_PORT | Destination port operator and value | Destination port, the range is 0-65535. Operator including eq (equal to), lt (less than), gt (greater than), neq (not equal to) and range |
| PRECEDENCE | Match packets with given precedence value | 0-7 |
| DSCP | Match packets with given dscp value | 0-63 |
| ECN | ecn value | 0-3 |
| non-fragment | Match packets with non fragment | - |

| | | |
|---|---|---|
| first-fragment | Match packets with first fragment | - |
| non-or-first-fragment | Match packets with non first fragment | - |
| small-fragment | Match packets with small fragment | - |
| non-first-fragment | Match packets with non first fragment | - |
| routed-packet | Match routed packet | - |
| options | Match packets with IP options | - |
| TIME_RANGE_NAME | The time-range used by the IP filter | A string with up to 40 characters |
| OPERATOR | Packet length,operator including eq (equal to), lt (less than), gt (greater than), and range | eq (equal to), lt (less than), gt (greater than), and range |
| LENGTH | The length value | 64-16382 |

## Command Mode

IP ACL Configuration

## Default

None

## Usage

The fragments will be invalid when the layer 4 information is specified (i.e. src-port).

## Examples

This example shows how to create a filter in IP ACL to deny any UDP packets:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1
Switch(config-ip-acl)# 1 permit udp any any
```

This example shows how to create a filter in IP ACL to deny the UDP packets with the source IP address 1.1.1.1, source port 10, and destination port less than 2000:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1
```

```
Switch(config-ip-acl)# 2 permit udp host 1.1.1.1 src-port eq 10 any dst-port lt
2000
```

### Related Commands

no sequence-num

## 11.4.18 permit icmp

### Command Purpose

Use this command to permit ICMP packets matching the IP filter.

### Command Syntax

( *SEQUENCE_NUM* | ) permit icmp ( *SRC_MAC SRC_MAC_MASK* | any | host *SRC_MAC* ) ( *DST_MAC DST_MAC_MASK* | any | host *DST_MAC* ) ( icmp-type *TYPE-NUM* ( icmp-code *CODE-NUM* | ) | ) ( ip-precedence *PRECEDENCE* | dscp *DSCP* | ) ( ecn <0-3> | ) ( non-fragment | first-fragment | non-or-first-fragment | small-fragment | non-first-fragment ) ( routed-packet | ) ( options | ) ( packet-length *OPERATOR LENGTH* | ) ( *TIME_RANGE_NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| icmp-type TYPE-NUM | ICMP message type | 0-255 |
| icmp-code CODE-NUM | ICMP message code | 0-255 |
| SEQUENCE_NUM | The sequence number of the filter in IP ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| SRC_MAC SRC_MAC_MASK | The source IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any source host | - |
| host SRC_MAC | The source IP address of a host | IPv4 Address |
| DST_MAC DST_MAC_MASK | The destination IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any destination host | - |
| host DST_MAC | The destination IP address of a host | IPv4 Address |
| PRECEDENCE | Match packets with given precedence value | 0-7 |

| | | |
|---|---|---|
| DSCP | Match packets with given dscp value | 0-63 |
| ECN | ecn value | 0-3 |
| non-fragment | Match packets with non fragment | - |
| first-fragment | Match packets with first fragment | - |
| non-or-first-fragment | Match packets with non first fragment | - |
| small-fragment | Match packets with small fragment | - |
| non-first-fragment | Match packets with non first fragment | - |
| routed-packet | Match routed packet | - |
| options | Match packets with IP options | - |
| TIME_RANGE_NAME | The time-range used by the IP filter | A string with up to 40 characters |
| OPERATOR | Packet length,operator including eq (equal to), lt (less than), gt (greater than), and range | eq (equal to), lt (less than), gt (greater than), and range |
| LENGTH | The length value | 64-16382 |

## Command Mode

IP ACL Configuration

## Default

None

## Usage

This type of filter is mostly used to permit ICMP packets.

## Examples

This example shows how to create a filter in IP ACL to permit any ICMP packets:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1
Switch(config-ip-acl)# 1 permit icmp any any
```

This example shows how to create a filter in IP ACL to permit the ICMP packets with the icmp-type 3 and icmp-code 3:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1
Switch(config-ip-acl)# 2 permit icmp any any icmp-type 3 icmp-code 3
```

### Related Commands

deny icmp

no sequence-num

## 11.4.19 permit igmp

### Command Purpose

Use this command to permit IGMP packets matching the IP filter.

### Command Syntax

( *SEQUENCE_NUM* | ) permit igmp ( *SRC_MAC SRC_MAC_MASK* | any | host *SRC_MAC* ) ( *DST_MAC DST_MAC_MASK* | any | host *DST_MAC* ) ( *IGMP-TYPE* | ) ( ip-precedence *PRECEDENCE* | dscp *DSCP* | ) ( ecn <0-3> | ) ( non-fragment | first-fragment | non-or-first-fragment | small-fragment | non-first-fragment ) ( routed-packet | ) ( options | ) ( packet-length *OPERATOR LENGTH* | ) ( *TIME_RANGE_NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IGMP-TYPE | IGMP type | IGMP type, including dvmrp, host-query, host-report, mtrace, mtrace-response, pim, precedence, trace, v2-leave, v2-report, v3-report |
| SEQUENCE_NUM | The sequence number of the filter in IP ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| SRC_MAC SRC_MAC_MASK | The source IP address and its wildcard bits | IPv4 Address and Mask |

| | | |
|---|---|---|
| any | Any source host | - |
| host SRC_MAC | The source IP address of a host | IPv4 Address |
| DST_MAC DST_MAC_MASK | The destination IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any destination host | - |
| host DST_MAC | The destination IP address of a host | IPv4 Address |
| PRECEDENCE | Match packets with given precedence value | 0-7 |
| DSCP | Match packets with given dscp value | 0-63 |
| ECN | ecn value | 0-3 |
| non-fragment | Match packets with non fragment | - |
| first-fragment | Match packets with first fragment | - |
| non-or-first-fragment | Match packets with non first fragment | - |
| small-fragment | Match packets with small fragment | - |
| non-first-fragment | Match packets with non first fragment | - |
| routed-packet | Match routed packet | - |
| options | Match packets with IP options | - |
| TIME_RANGE_NAME | The time-range used by the IP filter | A string with up to 40 characters |
| OPERATOR | Packet length,operator including eq (equal to), lt (less than), gt (greater than), and range | eq (equal to), lt (less than), gt (greater than), and range |
| LENGTH | The length value | 64-16382 |

## Command Mode

IP ACL Configuration

## Default

None

## Usage

This type of filter is mostly used to permit IGMP packets.

## Examples

This example shows how to create a filter in IP ACL to permit any IGMP packets:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1
Switch(config-ip-acl)# 1 permit igmp any any
```

This example shows how to create a filter in IP ACL to permit the IGMP packets with the source IP address 1.1.1.1, any destination IP address and the igmp-type pim:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1
Switch(config-ip-acl)# 2 permit igmp host 1.1.1.1 any pim
```

## Related Commands

no sequence-num

# 11.4.20 permit gre

## Command Purpose

Use this command to permit GRE packets matching the IP filter.

## Command Syntax

( *SEQUENCE_NUM* | ) permit gre ( *SRC_MAC SRC_MAC_MASK* | any | host *SRC_MAC* ) ( *DST_MAC DST_MAC_MASK* | any | host *DST_MAC* ) ( key *KEY* mask *KEY-MASK* ) ( ip-precedence *PRECEDENCE* | dscp *DSCP* | ) ( ecn <0-3> | ) ( non-fragment | first-fragment | non-or-first-fragment | small-fragment | non-first-fragment ) ( routed-packet | ) ( options | ) ( packet-length *OPERATOR LENGTH* | ) ( *TIME_RANGE_NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| KEY | GRE key | 0-4294967295 |
| KEY-MASK | GRE key mask | 0-0xFFFFFFFF |

| | | |
|---|---|---|
| SEQUENCE_NUM | The sequence number of the filter in IP ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| SRC_MAC SRC_MAC_MASK | The source IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any source host | - |
| host SRC_MAC | The source IP address of a host | IPv4 Address |
| DST_MAC DST_MAC_MASK | The destination IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any destination host | - |
| host DST_MAC | The destination IP address of a host | IPv4 Address |
| PRECEDENCE | Match packets with given precedence value | 0-7 |
| DSCP | Match packets with given dscp value | 0-63 |
| ECN | ecn value | 0-3 |
| non-fragment | Match packets with non fragment | - |
| first-fragment | Match packets with first fragment | - |
| non-or-first-fragment | Match packets with non first fragment | - |
| small-fragment | Match packets with small fragment | - |
| non-first-fragment | Match packets with non first fragment | - |
| routed-packet | Match routed packet | - |
| options | Match packets with IP options | - |
| TIME_RANGE_NAME | The time-range used by the IP filter | A string with up to 40 characters |
| OPERATOR | Packet length,operator including eq (equal to), lt (less than), gt (greater than), and range | eq (equal to), lt (less than), gt (greater than), and range |
| LENGTH | The length value | 64-16382 |

## Command Mode

IP ACL Configuration

## Default

None

## Usage

This type of filter is mostly used to permit GRE packets.

## Examples

This example shows how to create a filter in IP ACL to permit any GRE packets:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1
Switch(config-ip-acl)# 1 permit gre any any key 0 mask 0
```

This example shows how to create a filter in IP ACL to permit the GRE packets with the source IP address 1.1.1.1, any destination IP address and the gre key is 10:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1
Switch(config-ip-acl)# 2 permit gre host 1.1.1.1 any key 10 mask 0xffffffff
```

## Related Commands

no sequence-num

# 11.4.21 permit nvgre

## Command Purpose

Use this command to permit NVGRE packets matching the IP filter.

## Command Syntax

( *SEQUENCE_NUM* | ) permit nvgre ( *SRC_MAC SRC_MAC_MASK* | any | host *SRC_MAC* ) ( *DST_MAC DST_MAC_MASK* | any | host *DST_MAC* ) ( vsid *VSID* mask *VSID-MASK* ) ( ip-precedence *PRECEDENCE* | dscp *DSCP* | ) ( ecn <0-3> | ) ( non-fragment | first-fragment | non-or-first-fragment | small-fragment | non-first-fragment ) ( routed-packet | ) ( options | ) ( packet-length *OPERATOR LENGTH* | ) ( *TIME_RANGE_NAME* | )

*Please* reference to command “deny nvgre” for the other *parameters*.

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VSID | NVGRE vsid | 0-16777215 |
| VSID-MASK | NVGRE vsid mask | 0-0xFFFFFF |
| SEQUENCE_NUM | The sequence number of the filter in IP ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| SRC_MAC SRC_MAC_MASK | The source IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any source host | - |
| host SRC_MAC | The source IP address of a host | IPv4 Address |
| DST_MAC DST_MAC_MASK | The destination IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any destination host | - |
| host DST_MAC | The destination IP address of a host | IPv4 Address |
| PRECEDENCE | Match packets with given precedence value | 0-7 |
| DSCP | Match packets with given dscp value | 0-63 |
| ECN | ecn value | 0-3 |
| non-fragment | Match packets with non fragment | - |
| first-fragment | Match packets with first fragment | - |
| non-or-first-fragment | Match packets with non first fragment | - |
| small-fragment | Match packets with small fragment | - |
| non-first-fragment | Match packets with non first fragment | - |
| routed-packet | Match routed packet | - |
| options | Match packets with IP options | - |
| TIME_RANGE_NAME | The time-range used by the IP filter | A string with up to 40 characters |
| OPERATOR | Packet length,operator including eq (equal to), lt (less than), gt (greater than), and range | eq (equal to), lt (less than), gt (greater than), and range |
| LENGTH | The length value | 64-16382 |

### Command Mode

IP ACL Configuration

### Default

None

### Usage

This type of filter is mostly used to permit NVGRE packets.

### Examples

This example shows how to create a filter in IP ACL to permit any NVGRE packets:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1
Switch(config-ip-acl)# 1 permit nvgre any any vsid 0 mask 0
```

This example shows how to create a filter in IP ACL to permit the NVGRE packets with the source IP address 1.1.1.1, any destination IP address and the nvgre vsid is 10:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1
Switch(config-ip-acl)# 2 permit gre host 1.1.1.1 any vsid 10 mask 0xffffff
```

### Related Commands

no sequence-num

## 11.4.22 show access-list ip

### Command Purpose

Use this command to show the information of IP ACL.

### Command Syntax

show access-list ip ( *ACL_NAME* | )

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| ACL_NAME | The name of the IP ACL | A string with up to 40 characters |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to show the information of IP ACL:

```
Switch# show access-list ip
ip access-list list_ipv4_1
  2 permit tcp host 1.1.1.1 any
  3 deny icmp any any
  12 permit tcp any any
```

## Related Commands

ip access-list

# 11.4.23 user-ddefine access-list

## Command Purpose

Use this command to create UDF ACL and then enter UDF ACL in global configuration mode. Use no udf access-list command to delete the UDF ACL.

## Command Syntax

user-define access-list *ACL_NAME*

no user-define access-list *ACL_NAME*

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| ACL_NAME | The name of the UDF ACL | A string with up to 40 characters |

## Command Mode

Global Configuration

## Default

None

## Usage

If the system already has a UDF ACL with the same name, this command will enter the UDF ACL configuration mode. However, if the ACL name is used by other type of ACL, a prompt message will be shown.

When the name is not used by any ACL, this command is to create the UDF ACL firstly and then enter the UDF ACL configuration mode.

## Examples

This example shows how to create a UDF ACL named list_udf_1 and then enter the UDF ACL configuration mode:

```
Switch# configure terminal
Switch(config)# user-define access-list list_udf_1
Switch(config-udf-acl)#
```

This example shows how to remove the UDF ACL named list_udf_1:

```
Switch# configure terminal
Switch(config)# no user-define access-list list_udf_1
```

## Related Commands

permit udf

deny udf

# 11.4.24 permit udf

## Command Purpose

Use this command to permit packets matching the user-defined filter.

## Command Syntax

( *SEQUENCE_NUM* | ) permit ipv4-head *HEX_RULE HEX_MASK OFFSET* ( time-range *TIME_RANGE_NAME* | )

( *SEQUENCE_NUM* | ) permit ipv6-head *HEX_RULE HEX_MASK OFFSET* ( time-range *TIME_RANGE_NAME* | )

( *SEQUENCE_NUM* | ) permit l2-head *HEX_RULE HEX_MASK OFFSET* ( time-range *TIME_RANGE_NAME* | )

( *SEQUENCE_NUM* | ) permit l4-head *HEX_RULE HEX_MASK OFFSET* ( time-range *TIME_RANGE_NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SEQUENCE_NUM | The sequence number of the filter in UDF ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| HEX_RULE | Rule string | the string must be hexadecimal and start with '0x' no more than 10 characters(include '0x') |
| HEX_MASK | Mask to the rule string | the string must be hexadecimal and start with '0x' no more than 10 characters(include '0x') |
| OFFSET | Offset of the rule mask in the packet(unit: byte) | the value must equal '4n'(n=0, 1, 2...) |
| TIME_RANGE_NAME | The time-range used by the UDF filter | A string with up to 40 characters |

## Command Mode

UDF ACL Configuration

### Default

None

### Usage

None

### Examples

This type of filter is used to permit any kind of packets.:

```
Switch# configure terminal
Switch(config)# user-define access-list list_udf_1
Switch(config-udf-acl)# 1 permit l4-head 0x10 0x01 20
```

### Related Commands

None

## 11.4.25 deny udf

### Command Purpose

Use this command to deny packets matching the UDF filter.

### Command Syntax

( *SEQUENCE_NUM* | ) deny ipv4-head *HEX_RULE HEX_MASK OFFSET* ( time-range *TIME_RANGE_NAME* | )

( *SEQUENCE_NUM* | ) deny ipv6-head *HEX_RULE HEX_MASK OFFSET* ( time-range *TIME_RANGE_NAME* | )

( *SEQUENCE_NUM* | ) deny l2-head *HEX_RULE HEX_MASK OFFSET* ( time-range *TIME_RANGE_NAME* | )

( *SEQUENCE_NUM* | ) deny l4-head *HEX_RULE HEX_MASK OFFSET* ( time-range *TIME_RANGE_NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SEQUENCE_NUM | The sequence number of the filter in UDF ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| HEX_RULE | Rule string | the string must be hexadecimal and start with '0x' no more than 10 characters(include '0x') |
| HEX_MASK | Mask to the rule string | the string must be hexadecimal and start with '0x' no more than 10 characters(include '0x') |
| OFFSET | Offset of the rule mask in the packet(unit: byte) | the value must equal '4n'(n=0, 1, 2...) |
| TIME_RANGE_NAME | The time-range used by the UDF filter | A string with up to 40 characters |

## Command Mode

UDF ACL Configuration

## Default

None

## Usage

None

## Examples

This type of filter is mostly used to permit any kind of packets.:

```
Switch# configure terminal
Switch(config)# user-define access-list list_udf_1
Switch(config-udf-acl)# 1 deny l4-head 0x10 0x01 20
```

## Related Commands

None

# 11.4.26 show access-list udf

## Command Purpose

Use this command to show the information of UDF ACL.

## Command Syntax

show access-list user-define ( *ACL_NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ACL_NAME | The name of the UDF ACL | A string with up to 40 characters |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to show the information of UDF ACL:

```
Switch# show access-list user-define
user-define access-list list_udf_1
  10 permit l2-head 0x00000010 0x00000001 20
```

## Related Commands

udf access-list

# 11.5 Extend ACL Commands

## 11.5.1 ip access-list extend

### Command Purpose

Use this command to create extend IP ACL and then enter extend IP ACL configuration mode.

To remove this ACL, use the no form of this command.

### Command Syntax

ip access-list *ACL_NAME* extend

no ip access-list *ACL_NAME* extend

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ACL_NAME | The name of an extend IP ACL | A string with up to 40 characters |

### Command Mode

Global Configuration

### Default

None

### Usage

If the system already has an extend IP ACL with the same name, this command will enter the extend IP ACL configuration mode. However, if the ACL name is used by other type of ACL, a prompt message will be shown.

When the name is not used by any ACL, this command is to create an extend IP ACL firstly and then enter the extend IP ACL configuration mode.

On how to apply the created extend IP ACL in the interface, please refer to the usage of match access-group command in related chapter.

## Examples

This example shows how to create an extend IP ACL named list_ipv4_1 and then enter the extend IP ACL configuration mode:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1 extend
Switch(config-ex-ip-acl)#
```

This example shows how to remove the extend IP ACL named list_ipv4_1:

```
Switch# configure terminal
Switch(config)# no ip access-list list_ipv4_1 extend
```

## Related Commands

match access-group

# 11.5.2 sequence-num

## Command Purpose

Use this command to delete a filter from extend IP ACL.

## Command Syntax

no sequence-num *SEQUENCE_NUM*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SEQUENCE_NUM | The sequence number of an IP filter | 1-131071 |

## Command Mode

Extend IP ACL Configuration

## Default

None

## Usage

None

## Examples

This example shows how to delete an IP or MAC filter with sequence number 10 from an extend IP ACL:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1 extend
Switch(config-ex-ip-acl)# no sequence-num 10
```

## Related Commands

deny

deny udp

deny icmp

deny igmp

permit

permit tcp

permit udp

permit icmp

permit igmp

deny src-mac

permit src-mac

# 11.5.3 deny src-mac

## Command Purpose

Use this command to create a filter for discarding ongoing packets matching the filter rule.

## Command Syntax

( *SEQUENCE_NUM* | ) deny src-mac ( any | *MAC_ADDR MAC_ADDR_MASK* | host *MAC_ADDR* ) ( dest-mac ( any | *MAC_ADDR MAC_ADDR_MASK* | host *MAC_ADDR* ) | ) ( untag-vlan | ( vlan *VLAN_ID* | ) ( cos *COS* | ) ( inner-vlan *INNER_VLAN_ID* | )

( inner-cos *INNER_COS* | ) ) ( arp-packet ( ( arp-op-code ) ( sender-ip ( *IP_ADDR IP_ADDR_MASK* | any | host *IP_ADDR* ) | ) ( target-ip ( *IP_ADDR IP_ADDR_MASK* | any | host *IP_ADDR* ) | ) ) | packet-length *OPERATOR LENGTH* | ) ( time-range *TIME-RANGE-NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SEQUENCE_NUM | The sequence number of the filter in MAC ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| any | Any host | - |
| MAC_ADDR MAC_ADDR_MASK | The MAC address and its wildcard bits | MAC and wildcard in HHHH.HHHH.HHHH format |
| host MAC_ADDR | The host with a specified MAC address | MAC address in HHHH.HHHH.HHHH format |
| dest-mac | Destination MAC address | - |
| untag-vlan | untag-vlan | - |
| VLAN_ID | VLAN-ID | 1-4094 |
| COS | CoS | 0-7 |
| INNER_VLAN_ID | Inner VLAN-ID | 1-4094 |
| INNER_COS | Inner CoS | 0-7 |
| arp | ARP protocol | - |
| arp-op-code | arp-op-code | 0-65535 |
| sender-ip | sender-ip | - |
| target-ip | target-ip | - |
| IP_ADDR IP_ADDR_MASK | The ip address and wildcard bits | IPv4 Address and Mask |
| any | Any host | - |
| host IP_ADDR | The host with a specified ip address | IPv4 Address |
| TIME-RANGE-NAME | The time-range used by the extend IP filter | A string with up to 40 characters |
| OPERATOR | Packet length,operator including eq (equal to), lt (less than), gt (greater than), and range | eq (equal to), lt (less than), gt (greater than), and range |
| LENGTH | The length value | 64-16382 |

## Command Mode

Extend IP ACL Configuration

## Default

None

## Usage

An auto-generated sequence number will be assigned to the filter if the sequence-num field is not presented. The auto-generated sequence number is incremented by 10 on the maximum existing sequence number in the extend IP ACL. i.e. when the maximum existing sequence number is 100, the sequence number of subsequent created MAC filter is 110.

## Examples

This example shows how to create a filter in extend IP ACL to deny the packets with source MAC address 001A.A02C.A1DF:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1 extend
Switch(config-ex-ip-acl)# 1 deny src-mac host 001A.A02C.A1DF
```

This example shows how to create a filter in extend IP ACL to deny all the packets:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1 extend
Switch(config-ex-ip-acl)# 2 deny src-mac any
```

This example shows how to create a filter in extend IP ACL to deny the packet whose source MAC address is between the ranges specified:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1 extend
Switch(config-ex-ip-acl)# 3 deny src-mac 001A.A02C.A1DF 001A.A02C.0000
```

## Related Commands

no sequence-num

# 11.5.4 permit src-mac

## Command Purpose

Use this command to create a filter for allowing packets matching the filter rule to be delivered.

## Command Syntax

( *SEQUENCE_NUM* | ) permit src-mac ( any | *MAC_ADDR MAC_ADDR_MASK* | host *MAC_ADDR* ) ( dest-mac ( any | *MAC_ADDR MAC_ADDR_MASK* | host *MAC_ADDR* ) | ) ( untag-vlan | ( vlan *VLAN_ID* | ) ( cos *VALUE* | ) ( inner-vlan *INNER_VLAN_ID* | ) ( inner-cos *INNER_COS* | ) ) ( arp-packet ( ( arp-op-code ) ( sender-ip ( *IP_ADDR IP_ADDR_MASK* | any | host *IP_ADDR* ) | ) ( target-ip ( *IP_ADDR IP_ADDR_MASK* | any | host *IP_ADDR* ) | ) ) | packet-length *OPERATOR LENGTH* | ) ( time-range *TIME-RANGE-NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SEQUENCE_NUM | The sequence number of the filter in IP Extend ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| any | Any host | - |
| MAC_ADDR MAC_ADDR_MASK | The MAC address and its wildcard bits | MAC and wildcard in HHHH.HHHH.HHHH format |
| host MAC_ADDR | The host with a specified MAC address | MAC address in HHHH.HHHH.HHHH format |
| dest-mac | Destination MAC address | - |
| untag-vlan | untag-vlan | - |
| VLAN_ID | VLAN-ID | 1-4094 |
| COS | CoS | 0-7 |
| INNER_VLAN_ID | Inner VLAN-ID | 1-4094 |
| INNER_COS | Inner CoS | 0-7 |
| arp | ARP protocol | - |
| arp-op-code | arp-op-code | 0-65535 |
| sender-ip | sender-ip | - |
| target-ip | target-ip | - |
| IP_ADDR IP_ADDR_MASK | The ip address and wildcard bits | IPv4 Address and Mask |
| any | Any host | - |
| host IP_ADDR | The host with a specified ip address | IPv4 Address |
| TIME-RANGE-NAME | The time-range used by the extend IP filter | A string with up to 40 characters |
| OPERATOR | Packet length,operator including eq (equal to), lt (less than), gt (greater than), and range | eq (equal to), lt (less than), gt (greater than), and range |

| | | |
|---|---|---|
| LENGTH | The length value | 64-16382 |

## Command Mode

Extend IP ACL Configuration

## Default

None

## Usage

An auto-generated sequence number will be assigned to the filter if the sequence-num field is not presented. The auto-generated sequence number is incremented by 10 on the maximum existing sequence number in the extend IP ACL. i.e. when the maximum existing sequence number is 105, the sequence number of subsequent created MAC filter is 115.

## Examples

This example shows how to create a filter in extend IP ACL to permit the packets with source MAC address 001A.A02C.A1DF:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1 extend
Switch(config-ex-ip-ac)# 1 permit src-mac host 001A.A02C.A1DF
```

This example shows how to create a filter in extend IP ACL to permit all the packets:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1 extend
Switch(config-ex-ip-ac)# 2 permit src-mac any
```

This example shows how to create a filter in MAC ACL to permit the packets with source MAC address between the ranges specified:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1 extend
Switch(config-ex-ip-acl)# 3 permit src-mac 001A.A02C.A1DF 001A.A02C.0000
```

## Related Commands

no sequence-num

# 11.5.5 deny

## Command Purpose

Use this command to discard ongoing IP packets matching the IP filter.

## Command Syntax

( *SEQUENCE_NUM* | ) deny ( *PROTO_NUM* | any ) ( *SRC_IP SRC_IP_MASK* | any | host *SRC_IP* ) ( *DST_IP DST_IP_MASK* | any | host *DST_IP* ) ( ip-precedence *PRECEDENCE* | dscp *DSCP* | ) ( ecn <0-3> | ) ( non-fragment | first-fragment | non-or-first-fragment | small-fragment | non-first-fragment ) ( routed-packet | ) ( options | ) ( packet-length *OPERATOR LENGTH* | ) ( time-range *TIME-RANGE-NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SEQUENCE_NUM | The sequence number of the filter in IP ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| PROTO_NUM | An IP protocol number, the range is 0 to 255 | 协议编号 |
| any | Any protocol | - |
| SRC_IP SRC_IP_MASK | The source IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any source IP address | - |
| host SRC_IP | The source IP address of a host | IPv4 Address |
| DST_IP DST_IP_MASK | The destination IP address and its wildcard bits | IPv4 Address |
| any | An — Destination IP address | - |
| host DST_IP | The destination IP address of a host | IPv4 Address |
| PRECEDENCE | Match packets with given precedence value | 0-7 |
| DSCP | Match packets with given dscp value | 0-63 |
| ECN | ecn value | 0-3 |
| non-fragment | Match packets with non fragment | - |

| | | |
|---|---|---|
| first-fragment | Match packets with first fragment | - |
| non-or-first-fragment | Match packets with non first fragment | - |
| small-fragment | Match packets with small fragment | - |
| non-first-fragment | Match packets with non first fragment | - |
| routed-packet | Match routed packet | - |
| options | Match packets with IP options | - |
| TIME-RANGE-NAME | The time-range used by the filter | A string with up to 40 characters |
| OPERATOR | Packet length,operator including eq (equal to), lt (less than), gt (greater than), and range | eq (equal to), lt (less than), gt (greater than), and range |
| LENGTH | The length value | 64-16382 |

## Command Mode

Extend IP ACL Configuration

## Default

None

## Usage

If an IP address wildcard bit is provided, the IP address is logically-anded in bitwise with the reverse bits of the wildcard bits. For example, 10.10.10.0 0.0.0.255 means the addresses from 10.10.10.0 to 10.10.10.255 are matched.

An auto-generated sequence number will be assigned to the filter if the sequence-num field is not presented. The auto-generated sequence number is incremented by 10 on the maximum existing sequence number in the extend IP ACL. i.e. when the maximum existing sequence number is 100, the sequence number of subsequent created IP filter is 110.

## Examples

This example shows how to create a filter in extend IP ACL to deny any IP packets:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1 extend
Switch(config-ex-ip-acll)# 1 deny any any any
```

This example shows how to create a filter in extend IP ACL to deny the fragment packets with the source IP addresss 1.1.1.1:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1 extend
Switch(config-ex-ip-acll)# 2 deny any host 1.1.1.1 any fragments
```

This example shows how to create a filter in extend IP ACL to deny any routed packets:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1 extend
Switch(config-ex-ip-acll)# 3 deny any any any routed-packet
```

### Related Commands

no sequence-num

## 11.5.6 deny tcp

### Command Purpose

Use this command to reject TCP packets matching the IP filter.

### Command Syntax

( *SEQUENCE_NUM* | ) deny tcp ( *SRC_IP SRC_IP_MASK* | any | host *SRC_IP* ) ( src-port *OPERATOR SRC_PORT* | ) ( *DST_IP DST_IP_MASK* | any | host *DST_IP* ) ( dst-port *OPERATOR DST_PORT* | ) ( ip-precedence *PRECEDENCE* | dscp *DSCP* | ) ( ecn <0-3> | ) ( established | ( match-any | match-all *FLAG-NAME* | ) | ) ( non-fragment | first-fragment | non-or-first-fragment | small-fragment | non-first-fragment ) ( routed-packet | ) ( options | ) ( packet-length *OPERATOR LENGTH* | ) ( time-range *TIME-RANGE-NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SEQUENCE_NUM | The sequence number of the filter in IP Extend ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |

| | | |
|---|---|---|
| SRC_IP SRC_IP_MASK | The source IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any source host | - |
| host SRC_IP | The source IP address of a host | IPv4 Address |
| OPERATOR SRC_PORT | Source port operator and value | Source port, the range is 0-65535. Operator including eq (equal to), lt (less than), gt (greater than), neq (not equal to) and range |
| DST_IP DST_IP_MASK | The destination IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any destination host | - |
| host DST_IP | The destination IP address of a host | IPv4 Address |
| OPERATOR DST_PORT | Destination port operator and value | Destination port, the range is 0-65535. Operator including eq (equal to), lt (less than), gt (greater than), neq (not equal to) and range |
| PRECEDENCE | Match packets with given precedence value | 0-7 |
| DSCP | Match packets with given dscp value | 0-63 |
| ECN | ecn value | 0-3 |
| established | Match established connections | - |
| match-any | Match any of the flag-name | - |
| FLAG-NAME | Match all the flag-name, including ack, fin, psh, rst, syn and urg | ack, fin, psh, rst, syn and urg |
| non-fragment | Match packets with non fragment | - |
| first-fragment | Match packets with first fragment | - |
| non-or-first-fragment | Match packets with non first fragment | - |
| small-fragment | Match packets with small fragment | - |
| non-first-fragment | Match packets with non first fragment | - |
| routed-packet | Match routed packet | - |

| | | |
|---|---|---|
| options | Match packets with IP options | - |
| TIME-RANGE-NAME | The time-range used by the IP filter | A string with up to 40 characters |
| OPERATOR | Packet length,operator including eq (equal to), lt (less than), gt (greater than), and range | eq (equal to), lt (less than), gt (greater than), and range |
| LENGTH | The length value | 64-16382 |

## Command Mode

Extend IP ACL Configuration

## Default

None

## Usage

The fragments will be invalid when the layer 4 information is specified (i.e. src-port).

## Examples

This example shows how to create a filter in extend IP ACL to deny any TCP packets:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1 extend
Switch(config-ex-ip-acl)# 1 deny tcp any any
```

This example shows how to create a filter in extend IP ACL to deny the TCP packets with the source IP address 1.1.1.1, source port 0-100:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1 extend
Switch(config-ex-ip-acl)# 2 deny tcp host 1.1.1.1 src-port range 0 100 any
```

This example shows how to create a filter in extend IP ACL to deny any TCP packets in established TCP streams:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1 extend
Switch(config-ex-ip-acl)# 3 deny tcp any any established
```

This example shows how to create a filer in extend IP ACL to deny the TCP ACK packets with the source IP address 10.10.10.10:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1 extend
Switch(config-ex-ip-acl)# 4 deny tcp 10.10.10.0 0.0.0.0 any match-any ack
```

### Related Commands

no sequence-num

## 11.5.7 deny udp

### Command Purpose

Use this command to reject UDP packets matching the IP filter.

### Command Syntax

( *SEQUENCE_NUM* | ) deny udp ( *SRC_IP SRC_IP_MASK* | any | host *SRC_IP* ) ( src-port *OPERATOR SRC_PORT* | ) ( *DST_IP DST_IP_MASK* | any | host *DST_IP* ) ( dst-port *OPERATOR DST_PORT* | ) ( ip-precedence *PRECEDENCE* | dscp *DSCP* | ) ( ecn <0-3> | ) ( non-fragment | first-fragment | non-or-first-fragment | small-fragment | non-first-fragment ) ( routed-packet | ) ( options | ) ( packet-length *OPERATOR LENGTH* | ) ( time-range *TIME-RANGE-NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SEQUENCE_NUM | The sequence number of the filter in IP Extend ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| SRC_IP SRC_IP_MASK | The source IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any source host | - |
| host SRC_IP | The source IP address of a host | IPv4 Address |
| OPERATOR SRC_PORT | Source port operator and value | Source port, the range is 0-65535. Operator including eq (equal to), lt (less than), gt (greater than), neq (not equal to) and range |

| | | |
|---|---|---|
| DST_IP DST_IP_MASK | The destination IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any destination host | - |
| host DST_IP | The destination IP address of a host | IPv4 Address |
| OPERATOR DST_PORT | Destination port operator and value | Destination port, the range is 0-65535. Operator including eq (equal to), lt (less than), gt (greater than), neq (not equal to) and range |
| PRECEDENCE | Match packets with given precedence value | 0-7 |
| DSCP | Match packets with given dscp value | 0-63 |
| ECN | ecn value | 0-3 |
| non-fragment | Match packets with non fragment | - |
| first-fragment | Match packets with first fragment | - |
| non-or-first-fragment | Match packets with non first fragment | - |
| small-fragment | Match packets with small fragment | - |
| non-first-fragment | Match packets with non first fragment | - |
| routed-packet | Match routed packet | - |
| options | Match packets with IP options | - |
| TIME-RANGE-NAME | The time-range used by the IP filter | A string with up to 40 characters |
| OPERATOR | Packet length,operator including eq (equal to), lt (less than), gt (greater than), and range | eq (equal to), lt (less than), gt (greater than), and range |
| LENGTH | The length value | 64-16382 |

## Command Mode

Extend IP ACL Configuration

## Default

None

## Usage

The fragments will be invalid when the layer 4 information is specified (i.e. src-port).

## Examples

This example shows how to create a filter in IP ACL to deny any UDP packets:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1 extend
Switch(config-ex-ip-acl)# 1 deny udp any any
```

This example shows how to create a filter in IP ACL to deny the UDP packets with the source IP 1.1.1.1, source port 10, and destination port less than 2000:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1 extend
Switch(config-ex-ip-acl)# 2 deny udp host 1.1.1.1 src-port eq 10 any dst-port lt
2000
```

## Related Commands

no sequence-num

# 11.5.8 deny icmp

## Command Purpose

Use this command to reject ICMP packets matching the IP filter.

## Command Syntax

( *SEQUENCE_NUM* | ) deny icmp ( *SRC_IP SRC_IP_MASK* | any | host *SRC_IP* ) ( *DST_IP DST_IP_MASK* | any | host *DST_IP* ) ( icmp-type *TYPE-NUM* ( icmp-code *CODE-NUM* | ) | ) ( ip-precedence *PRECEDENCE* | dscp *DSCP* | ) ( ecn <0-3> | ) ( non-fragment | first-fragment | non-or-first-fragment | small-fragment | non-first-fragment ) ( routed-packet | ) ( options | ) ( packet-length *OPERATOR LENGTH* | ) ( time-range *TIME-RANGE-NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| TYPE-NUM | ICMP message type | 0-255 |
| CODE-NUM | ICMP message code | 0-255 |

| | | |
|---|---|---|
| SEQUENCE_NUM | The sequence number of the filter in IP ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| SRC_IP SRC_IP_MASK | The source IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any source IP address | - |
| host SRC_IP | The source IP address of a host | IPv4 Address |
| DST_IP DST_IP_MASK | The destination IP address and its wildcard bits | IPv4 Address |
| any | An — Destination IP address | - |
| host DST_IP | The destination IP address of a host | IPv4 Address |
| PRECEDENCE | Match packets with given precedence value | 0-7 |
| DSCP | Match packets with given dscp value | 0-63 |
| ECN | ecn value | 0-3 |
| non-fragment | Match packets with non fragment | - |
| first-fragment | Match packets with first fragment | - |
| non-or-first-fragment | Match packets with non first fragment | - |
| small-fragment | Match packets with small fragment | - |
| non-first-fragment | Match packets with non first fragment | - |
| routed-packet | Match routed packet | - |
| options | Match packets with IP options | - |
| TIME-RANGE-NAME | The time-range used by the filter | A string with up to 40 characters |
| OPERATOR | Packet length,operator including eq (equal to), lt (less than), gt (greater than), and range | eq (equal to), lt (less than), gt (greater than), and range |
| LENGTH | The length value | 64-16382 |

## Command Mode

Extend IP ACL Configuration

## Default

None

## Usage

None

## Examples

This example shows how to create a filter in extend IP ACL to deny any UDP packets:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1 extend
Switch(config-ex-ip-acll)# 1 deny udp any any
```

This example shows how to create a filter in extend IP ACL to deny the UDP packets with the source IP 1.1.1.1, source port 10, and destination port less than 2000:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1 extend
Switch(config-ex-ip-acll)# 2 deny udp host 1.1.1.1 src-port eq 10 any dst-port lt
2000
```

## Related Commands

no sequence-num

# 11.5.9 deny igmp

## Command Purpose

Use this command to reject IGMP packets matching the IP filter.

## Command Syntax

( *SEQUENCE_NUM* | ) deny igmp ( *SRC_IP SRC_IP_MASK* | any | host *SRC_IP* ) ( *DST_IP DST_IP_MASK* | any | host *DST_IP* ) ( *IGMP-TYPE* | ) ( ip-precedence *PRECEDENCE* | dscp *DSCP* | ) ( ecn <0-3> | ) ( non-fragment | first-fragment | non-or-first-fragment | small-fragment | non-first-fragment ) ( routed-packet | ) ( options | ) ( packet-length *OPERATOR LENGTH* | ) ( time-range *TIME-RANGE-NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IGMP-TYPE | IGMP type | including dvmrp, host-query, host-report, mtrace, mtrace-response, pim, precedence, trace, v2-leave, v2-report, v3-report |
| SEQUENCE_NUM | The sequence number of the filter in IP ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| SRC_IP SRC_IP_MASK | The source IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any source IP address | - |
| host SRC_IP | The source IP address of a host | - |
| DST_IP DST_IP_MASK | The destination IP address and its wildcard bits | IPv4 Address |
| any | An → Destination IP address | - |
| host DST_IP | The destination IP address of a host | IPv4 Address |
| PRECEDENCE | Match packets with given precedence value | 0-7 |
| DSCP | Match packets with given dscp value | 0-63 |
| ECN | ecn value | 0-3 |
| non-fragment | Match packets with non fragment | - |
| first-fragment | Match packets with first fragment | - |
| non-or-first-fragment | Match packets with non first fragment | - |
| small-fragment | Match packets with small fragment | - |
| non-first-fragment | Match packets with non first fragment | - |
| routed-packet | Match routed packet | - |
| options | Match packets with IP options | - |
| TIME-RANGE-NAME | The time-range used by the filter | A string with up to 40 characters |

| | | |
|---|---|---|
| OPERATOR | Packet length,operator including eq (equal to), lt (less than), gt (greater than), and range | eq (equal to), lt (less than), gt (greater than), and range |
| LENGTH | The length value | 64-16382 |

## Command Mode

Extend IP ACL Configuration

## Default

None

## Usage

None

## Examples

This example shows how to create a filter in extend IP ACL to deny any ICMP packets:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1 extend
Switch(config-ex-ip-acll)# 1 deny icmp any any
```

This example shows how to create a filter in extend IP ACL to deny the ICMP packets with the icmp-type 3 and icmp-code 3:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1 extend
Switch(config-ex-ip-acll)# 2 deny icmp any any icmp-type 3 icmp-code 3
```

## Related Commands

no sequence-num

# 11.5.10 deny gre

## Command Purpose

Use this command to reject GRE packets matching the IP filter.

## Command Syntax

( *SEQUENCE_NUM* | ) deny gre ( *SRC_IP SRC_IP_MASK* | any | host *SRC_IP* ) ( *DST_IP DST_IP_MASK* | any | host *DST_IP* ) ( key *KEY* mask *KEY-MASK* ) ( ip-precedence *PRECEDENCE* | dscp *DSCP* | ) ( ecn <0-3> | ) ( non-fragment | first-fragment | non-or-first-fragment | small-fragment | non-first-fragment | ) ( routed-packet | ) ( options | ) ( packet-length *OPERATOR LENGTH* | ) ( time-range *TIME-RANGE-NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| KEY | GRE key | 0-4294967295 |
| KEY-MASK | GRE key mask | 0-0xFFFFFFFF |
| SEQUENCE_NUM | The sequence number of the filter in IP ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| SRC_IP SRC_IP_MASK | The source IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any source IP address | - |
| host SRC_IP | The source IP address of a host | - |
| DST_IP DST_IP_MASK | The destination IP address and its wildcard bits | IPv4 Address |
| any | An — Destination IP address | - |
| host DST_IP | The destination IP address of a host | IPv4 Address |
| PRECEDENCE | Match packets with given precedence value | 0-7 |
| DSCP | Match packets with given dscp value | 0-63 |
| ECN | ecn value | 0-3 |
| non-fragment | Match packets with non fragment | - |
| first-fragment | Match packets with first fragment | - |
| non-or-first-fragment | Match packets with non first fragment | - |
| small-fragment | Match packets with small fragment | - |
| non-first-fragment | Match packets with non first fragment | - |

| | | |
|---|---|---|
| routed-packet | Match routed packet | - |
| options | Match packets with IP options | - |
| TIME-RANGE-NAME | The time-range used by the filter | A string with up to 40 characters |
| OPERATOR | Packet length,operator including eq (equal to), lt (less than), gt (greater than), and range | eq (equal to), lt (less than), gt (greater than), and range |
| LENGTH | The length value | 64-16382 |

## Command Mode

Extend IP ACL Configuration

## Default

None

## Usage

This type of filter is mostly used to reject GRE packets.

## Examples

This example shows how to create a filter in extend IP ACL to deny any IGMP packets:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1 extend
Switch(config-ex-ip-acll)# 1 deny igmp any any
```

This example shows how to create a filter in extend IP ACL to deny the IGMP packets with the source IP address 1.1.1.1, any destination IP address and the igmp-type pim:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1 extend
Switch(config-ex-ip-acll)# 2 deny igmp host 1.1.1.1 any pim
```

## Related Commands

no sequence-num

# 11.5.11 deny nvgre

## Command Purpose

Use this command to reject NVGRE packets matching the IP filter.

## Command Syntax

( *SEQUENCE_NUM* | ) deny nvgre ( *SRC_IP SRC_IP_MASK* | any | host *SRC_IP* ) ( *DST_IP DST_IP_MASK* | any | host *DST_IP* ) ( vsid *VSID* mask *VSID-MASK* ) ( ip-precedence *PRECEDENCE* | dscp *DSCP* | ) ( ecn <0-3> | ) ( non-fragment | first-fragment | non-or-first-fragment | small-fragment | non-first-fragment | ) ( routed-packet | ) ( options | ) ( packet-length *OPERATOR LENGTH* | ) ( time-range *TIME-RANGE-NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VSID | NVGRE vsid | 0-16777215 |
| VSID-MASK | NVGRE vsid mask | 0-0xFFFFFF |
| SEQUENCE_NUM | The sequence number of the filter in IP ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| SRC_IP SRC_IP_MASK | The source IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any source IP address | - |
| host SRC_IP | The source IP address of a host | - |
| DST_IP DST_IP_MASK | The destination IP address and its wildcard bits | IPv4 Address |
| any | An — Destination IP address | - |
| host DST_IP | The destination IP address of a host | IPv4 Address |
| PRECEDENCE | Match packets with given precedence value | 0-7 |
| DSCP | Match packets with given dscp value | 0-63 |
| ECN | ecn value | 0-3 |
| non-fragment | Match packets with non fragment | - |

| | | |
|---|---|---|
| first-fragment | Match packets with first fragment | - |
| non-or-first-fragment | Match packets with non first fragment | - |
| small-fragment | Match packets with small fragment | - |
| non-first-fragment | Match packets with non first fragment | - |
| routed-packet | Match routed packet | - |
| options | Match packets with IP options | - |
| TIME-RANGE-NAME | The time-range used by the filter | A string with up to 40 characters |
| OPERATOR | Packet length,operator including eq (equal to), lt (less than), gt (greater than), and range | eq (equal to), lt (less than), gt (greater than), and range |
| LENGTH | The length value | 64-16382 |

## Command Mode

Extend IP ACL Configuration

## Default

None

## Usage

This type of filter is mostly used to reject NVGRE packets.

## Examples

This example shows how to create a filter in extend IP ACL to deny any GRE packets:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1 extend
Switch(config-ex-ip-acl)# 1 deny gre any any key 0 mask 0
```

This example shows how to create a filter in extend IP ACL to deny the GRE packets with the source IP address 1.1.1.1, any destination IP address and the gre key is 10:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1 extend
Switch(config-ex-ip-acl)# 2 deny gre host 1.1.1.1 any key 10 mask 0xffffffff
```

## Related Commands

no sequence-num

# 11.5.12 permit

## Command Purpose

Use this command to permit packets matching the IP filter.

## Command Syntax

( *SEQUENCE_NUM* | ) permit ( *PROTO_NUM* | any ) ( *SRC_IP SRC_IP_MASK* | any | host *SRC_IP* ) ( *DST_IP DST_IP_MASK* | any | host *DST_IP* ) ( ip-precedence *PRECEDENCE* | dscp *DSCP* | ) ( ecn <0-3> | ) ( non-fragment | first-fragment | non-or-first-fragment | small-fragment | non-first-fragment ) ( routed-packet | ) ( options | ) ( packet-length *OPERATOR LENGTH* | ) ( time-range *TIME-RANGE-NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SEQUENCE_NUM | The sequence number of the filter in IP ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| PROTO_NUM | An IP protocol number, the range is 0 to 255 | 0-255 |
| any | Any protocol | - |
| SRC_IP SRC_IP_MASK | The source IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any source IP address | - |
| host SRC_IP | The source IP address of a host | - |
| DST_IP DST_IP_MASK | The destination IP address and its wildcard bits | IPv4 Address |
| any | An — Destination IP address | - |
| host DST_IP | The destination IP address of a host | IPv4 Address |
| PRECEDENCE | Match packets with given precedence value | 0-7 |

| | | |
|---|---|---|
| DSCP | Match packets with given dscp value | 0-63 |
| ECN | ecn value | 0-3 |
| non-fragment | Match packets with non fragment | - |
| first-fragment | Match packets with first fragment | - |
| non-or-first-fragment | Match packets with non first fragment | - |
| small-fragment | Match packets with small fragment | - |
| non-first-fragment | Match packets with non first fragment | - |
| routed-packet | Match routed packet | - |
| options | Match packets with IP options | - |
| TIME-RANGE-NAME | The time-range used by the filter | A string with up to 40 characters |
| OPERATOR | Packet length,operator including eq (equal to), lt (less than), gt (greater than), and range | eq (equal to), lt (less than), gt (greater than), and range |
| LENGTH | The length value | 64-16382 |

## Command Mode

Extend IP ACL Configuration

## Default

None

## Usage

If an IP address wildcard bit is provided, the IP address is logically-anded in bitwise with the reverse bits of the wildcard bits. For example, 10.10.10.0 0.0.0.255 means the addresses from 10.10.10.0 to 10.10.10.255 are matched.

An auto-generated sequence number will be assigned to the filter if the sequence-num field is not presented. The auto-generated sequence number is incremented by 10 on the maximum existing sequence number in the extend IP ACL. i.e. when the maximum existing sequence number is 105, the sequence number of subsequent created IP filter is 115.

## Examples

This example shows how to create a filter in extend IP ACL to deny any NVGRE packets:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1 extend
Switch(config-ex-ip-acl)# 1 deny nvgre any any vsid 0 mask 0
```

This example shows how to create a filter in extend IP ACL to deny the NVGRE packets with the source IP address 1.1.1.1, any destination IP address and the nvgre vsid is 10:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1 extend
Switch(config-ex-ip-acl)# 2 deny gre host 1.1.1.1 any vsid 10 mask 0xffffff
```

This example shows how to create a filter in extend IP ACL to permit any routed packets:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1 extend
Switch(config-ex-ip-acl)# 30 permit any any any routed-packet
```

## Related Commands

no sequence-num

# 11.5.13 permit tcp

## Command Purpose

Use this command to permit TCP packets matching the IP filter.

## Command Syntax

( *SEQUENCE_NUM* | ) permit tcp ( *SRC_IP SRC_IP_MASK* | any | host *SRC_IP* ) ( src-port *OPERATOR SRC_PORT* | ) ( *DST_IP DST_IP_MASK* | any | host *DST_IP* ) ( dst-port *OPERATOR DST_PORT* | ) ( ip-precedence *PRECEDENCE* | dscp *DSCP* | ) ( ecn <0-3> | ) ( established | ( match-any | match-all *FLAG-NAME* | ) | ) ( non-fragment | first-fragment | non-or-first-fragment | small-fragment | non-first-fragment ) ( routed-packet | ) ( options | ) ( packet-length *OPERATOR LENGTH* | ) ( time-range *TIME-RANGE-NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SEQUENCE_NUM | The sequence number of the filter in IP Extend ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| SRC_IP SRC_IP_MASK | The source IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any source host | - |
| host SRC_IP | The source IP address of a host | IPv4 Address |
| OPERATOR SRC_PORT | Source port operator and value | Source port, the range is 0-65535. Operator including eq (equal to), lt (less than), gt (greater than), neq (not equal to) and range |
| DST_IP DST_IP_MASK | The destination IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any destination host | - |
| host DST_IP | The destination IP address of a host | IPv4 Address |
| OPERATOR DST_PORT | Destination port operator and value | Destination port, the range is 0-65535. Operator including eq (equal to), lt (less than), gt (greater than), neq (not equal to) and range |
| PRECEDENCE | Match packets with given precedence value | 0-7 |
| DSCP | Match packets with given dscp value | 0-63 |
| ECN | ecn value | 0-3 |
| established | Match established connections | - |
| match-any | Match any of the flag-name | - |
| FLAG-NAME | Match all the flag-name, including ack, fin, psh, rst, syn and urg | ack, fin, psh, rst, syn and urg |
| non-fragment | Match packets with non fragment | - |
| first-fragment | Match packets with first fragment | - |
| non-or-first-fragment | Match packets with non first fragment | - |

| | | |
|---|---|---|
| small-fragment | Match packets with small fragment | - |
| non-first-fragment | Match packets with non first fragment | - |
| routed-packet | Match routed packet | - |
| options | Match packets with IP options | - |
| TIME-RANGE-NAME | The time-range used by the IP filter | - |
| OPERATOR | Packet length,operator including eq (equal to), lt (less than), gt (greater than), and range | eq (equal to), lt (less than), gt (greater than), and range |
| LENGTH | The length value | 64-16382 |

## Command Mode

Extend IP ACL Configuration

## Default

None

## Usage

The fragments will be invalid when the layer 4 information is specified (i.e. src-port).

## Examples

This example shows how to create a filter in extend IP ACL to permit any TCP packets:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1 extend
Switch(config-ex-ip-acll)# 10 permit tcp any any
```

This example shows how to create a filter in extend IP ACL to permit the TCP packets with the source IP address 1.1.1.1, and source port ranges from 0 to 100:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1 extend
Switch(config-ex-ip-acll)# 20 permit tcp host 1.1.1.1 src-port range 0 100 any
```

This example shows how to create a filter in extend IP ACL to permit any TCP packets in established TCP streams:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1 extend
Switch(config-ex-ip-acll)# 30 permit tcp any any established
```

This example shows how to create a filter in extend IP ACL to permit the TCP ACK packets with the source IP address 10.10.10.0:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1 extend
Switch(config-ex-ip-acll)# 4 permit tcp 10.10.10.0 0.0.0.0 any match-any ack
```

### Related Commands

no sequence-num

## 11.5.14 permit udp

### Command Purpose

Use this command to permit UDP packets when the packets match this access-list.

### Command Syntax

( *SEQUENCE_NUM* | ) permit udp ( *SRC_IP SRC_IP_MASK* | any | host *SRC_IP* ) ( src-port *OPERATOR SRC_PORT* | ) ( *DST_IP DST_IP_MASK* | any | host *DST_IP* ) ( dst-port *OPERATOR DST_PORT* | ) ( ip-precedence *PRECEDENCE* | dscp *DSCP* | ) ( ecn <0-3> | ) ( non-fragment | first-fragment | non-or-first-fragment | small-fragment | non-first-fragment ) ( routed-packet | ) ( options | ) ( packet-length *OPERATOR LENGTH* | ) ( time-range *TIME-RANGE-NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SEQUENCE_NUM | The sequence number of the filter in IP Extend ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| SRC_IP SRC_IP_MASK | The source IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any source host | - |

| | | |
|---|---|---|
| host SRC_IP | The source IP address of a host | IPv4 Address |
| OPERATOR SRC_PORT | Source port operator and value | Source port, the range is 0-65535. Operator including eq (equal to), lt (less than), gt (greater than), neq (not equal to) and range |
| DST_IP DST_IP_MASK | The destination IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any destination host | - |
| host DST_IP | The destination IP address of a host | IPv4 Address |
| OPERATOR DST_PORT | Destination port operator and value | Destination port, the range is 0-65535. Operator including eq (equal to), lt (less than), gt (greater than), neq (not equal to) and range |
| PRECEDENCE | Match packets with given precedence value | 0-7 |
| DSCP | Match packets with given dscp value | 0-63 |
| ECN | ecn value | 0-3 |
| non-fragment | Match packets with non fragment | - |
| first-fragment | Match packets with first fragment | - |
| non-or-first-fragment | Match packets with non first fragment | - |
| small-fragment | Match packets with small fragment | - |
| non-first-fragment | Match packets with non first fragment | - |
| routed-packet | Match routed packet | - |
| options | Match packets with IP options | - |
| TIME-RANGE-NAME | The time-range used by the IP filter | - |
| OPERATOR | Packet length,operator including eq (equal to), lt (less than), gt (greater than), and range | eq (equal to), lt (less than), gt (greater than), and range |
| LENGTH | The length value | 64-16382 |

## Command Mode

Extend IP ACL Configuration

## Default

None

## Usage

The fragments will be invalid when the layer 4 information is specified (i.e. src-port).

## Examples

This example shows how to create a filter in extend IP ACL to deny any UDP packets:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1 extend
Switch(config-ex-ip-acll)# 1 permit udp any any
```

This example shows how to create a filter in extend IP ACL to deny the UDP packets with the source IP address 1.1.1.1, source port 10, and destination port less than 2000:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1 extend
Switch(config-ex-ip-acll)# 2 permit udp host 1.1.1.1 src-port eq 10 any dst-port lt
2000
```

## Related Commands

no sequence-num

# 11.5.15 permit icmp

## Command Purpose

Use this command to permit ICMP packets when the packets match this access-list.

## Command Syntax

( *SEQUENCE_NUM* | ) permit icmp ( *SRC_IP SRC_IP_MASK* | any | host *SRC_IP* ) ( *DST_IP DST_IP_MASK* | any | host *DST_IP* ) ( icmp-type *TYPE-NUM* ( icmp-code *CODE-NUM* | ) | ) ( ip-precedence *PRECEDENCE* | dscp *DSCP* | ) ( ecn <0-3> | ) ( non-fragment | first-fragment | non-or-first-fragment | small-fragment | non-first-fragment ) ( routed-packet | ) ( options | ) ( packet-length *OPERATOR LENGTH* | ) ( time-range *TIME-RANGE-NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| icmp-type TYPE-NUM | ICMP message type | 0-255 |
| icmp-code CODE-NUM | ICMP message code | 0-255 |
| SEQUENCE_NUM | The sequence number of the filter in IP ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| SRC_IP SRC_IP_MASK | The source IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any source IP address | - |
| host SRC_IP | The source IP address of a host | - |
| DST_IP DST_IP_MASK | The destination IP address and its wildcard bits | IPv4 Address |
| any | An — Destination IP address | - |
| host DST_IP | The destination IP address of a host | IPv4 Address |
| PRECEDENCE | Match packets with given precedence value | 0-7 |
| DSCP | Match packets with given dscp value | 0-63 |
| ECN | ecn value | 0-3 |
| non-fragment | Match packets with non fragment | - |
| first-fragment | Match packets with first fragment | - |
| non-or-first-fragment | Match packets with non first fragment | - |
| small-fragment | Match packets with small fragment | - |
| non-first-fragment | Match packets with non first fragment | - |

| | | |
|---|---|---|
| routed-packet | Match routed packet | - |
| options | Match packets with IP options | - |
| TIME-RANGE-NAME | The time-range used by the filter | A string with up to 40 characters |
| OPERATOR | Packet length,operator including eq (equal to), lt (less than), gt (greater than), and range | eq (equal to), lt (less than), gt (greater than), and range |
| LENGTH | The length value | 64-16382 |

## Command Mode

Extend IP ACL Configuration

## Default

None

## Usage

None

## Examples

This example shows how to create a filter in extend IP ACL to permit any ICMP packets:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1 extend
Switch(config-ex-ip-acll)# 1 permit icmp any any
```

This example shows how to create a filter in extend IP ACL to permit the ICMP packets with the icmp-type 3 and icmp-code 3:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1 extend
Switch(config-ex-ip-acll)# 2 permit icmp any any icmp-type 3 icmp-code 3
```

## Related Commands

None

# 11.5.16 permit igmp

## Command Purpose

Use this command to permit IGMP packets matching the IP filter.

## Command Syntax

( *SEQUENCE_NUM* | ) permit igmp ( *SRC_IP SRC_IP_MASK* | any | host *SRC_IP* ) ( *DST_IP DST_IP_MASK* | any | host *DST_IP* ) ( *IGMP-TYPE* | ) ( ip-precedence *PRECEDENCE* | dscp *DSCP* | ) ( ecn <0-3> | ) ( non-fragment | first-fragment | non-or-first-fragment | small-fragment | non-first-fragment ) ( routed-packet | ) ( options | ) ( packet-length *OPERATOR LENGTH* | ) ( time-range *TIME-RANGE-NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IGMP-TYPE | IGMP type | including dvmrp, host-query, host-report, mtrace, mtrace-response, pim, precedence, trace, v2-leave, v2-report, v3-report |
| SEQUENCE_NUM | The sequence number of the filter in IP ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| PROTO_NUM | An IP protocol number, the range is 0 to 255 | 0-255 |
| any | Any protocol | - |
| SRC_IP SRC_IP_MASK | The source IP address and its wildcard bits | IPv4 Address and Mask |
| DST_IP DST_IP_MASK | The destination IP address and its wildcard bits | IPv4 Address |
| any | An — Destination IP address | - |
| host DST_IP | The destination IP address of a host | IPv4 Address |
| PRECEDENCE | Match packets with given precedence value | 0-7 |
| DSCP | Match packets with given dscp value | 0-63 |

| | | |
|---|---|---|
| ECN | ecn value | 0-3 |
| non-fragment | Match packets with non fragment | - |
| first-fragment | Match packets with first fragment | - |
| non-or-first-fragment | Match packets with non first fragment | - |
| small-fragment | Match packets with small fragment | - |
| non-first-fragment | Match packets with non first fragment | - |
| routed-packet | Match routed packet | - |
| options | Match packets with IP options | - |
| TIME-RANGE-NAME | The time-range used by the filter | A string with up to 40 characters |
| OPERATOR | Packet length,operator including eq (equal to), lt (less than), gt (greater than), and range | eq (equal to), lt (less than), gt (greater than), and range |
| LENGTH | The length value | 64-16382 |

## Command Mode

Extend IP ACL Configuration

## Default

None

## Usage

None

## Examples

This example shows how to create a filter in extend IP ACL to permit any IGMP packets:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1 extend
Switch(config-ex-ip-acll)# 1 permit igmp any any
```

This example shows how to create a filter in extend IP ACL to permit the IGMP packets with the source IP address 1.1.1.1, any destination IP address and the igmp-type pim:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1 extend
Switch(config-ex-ip-acll)# 2 permit igmp host 1.1.1.1 any pim
```

### Related Commands

no sequence-num

## 11.5.17 permit gre

### Command Purpose

Use this command to permit GRE packets matching the IP filter.

### Command Syntax

( *SEQUENCE_NUM* | ) permit gre ( *SRC_IP SRC_IP_MASK* | any | host *SRC_IP* ) ( *DST_IP DST_IP_MASK* | any | host *DST_IP* ) ( key *KEY* mask *KEY-MASK* ) ( ip-precedence *PRECEDENCE* | dscp *DSCP* | ) ( ecn <0-3> | ) ( non-fragment | first-fragment | non-or-first-fragment | small-fragment | non-first-fragment | ) ( routed-packet | ) ( options | ) ( packet-length *OPERATOR LENGTH* | ) ( time-range *TIME-RANGE-NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| KEY | GRE key | 0-4294967295 |
| KEY-MASK | GRE key mask | 0-0xFFFFFFFF |
| SEQUENCE_NUM | The sequence number of the filter in IP ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| SRC_IP SRC_IP_MASK | The source IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any source IP address | - |
| host SRC_IP | The source IP address of a host | IPv4 Address |
| DST_IP DST_IP_MASK | The destination IP address and its wildcard bits | IPv4 Address |

| | | |
|---|---|---|
| any | An — Destination IP address | - |
| host DST_IP | The destination IP address of a host | IPv4 Address |
| PRECEDENCE | Match packets with given precedence value | 0-7 |
| DSCP | Match packets with given dscp value | 0-63 |
| ECN | ecn value | 0-3 |
| non-fragment | Match packets with non fragment | - |
| first-fragment | Match packets with first fragment | - |
| non-or-first-fragment | Match packets with non first fragment | - |
| small-fragment | Match packets with small fragment | - |
| non-first-fragment | Match packets with non first fragment | - |
| routed-packet | Match routed packet | - |
| options | Match packets with IP options | - |
| TIME-RANGE-NAME | The time-range used by the filter | A string with up to 40 characters |
| OPERATOR | Packet length,operator including eq (equal to), lt (less than), gt (greater than), and range | eq (equal to), lt (less than), gt (greater than), and range |
| LENGTH | The length value | 64-16382 |

## Command Mode

Extend IP ACL Configuration

## Default

None

## Usage

This type of filter is mostly used to permit GRE packets.

## Examples

This example shows how to create a filter in extend IP ACL to permit any GRE packets:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1 extend
Switch(config-ex-ip-acl)# 1 permit gre any any key 0 mask 0
```

This example shows how to create a filter in extend IP ACL to permit the GRE packets with the source IP address 1.1.1.1, any destination IP address and the gre key is 10:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1 extend
Switch(config-ex-ip-acl)# 2 permit gre host 1.1.1.1 any key 10 mask 0xffffffff
```

## Related Commands

no sequence-num

# 11.5.18 permit nvgre

## Command Purpose

Use this command to permit NVGRE packets matching the IP filter.

## Command Syntax

( *SEQUENCE_NUM* | ) permit nvgre ( *SRC_IP SRC_IP_MASK* | any | host *SRC_IP* ) ( *DST_IP DST_IP_MASK* | any | host *DST_IP* ) ( vsid *VSID* mask *VSID-MASK* ) ( ip-precedence *PRECEDENCE* | dscp *DSCP* | ) ( ecn <0-3> | ) ( non-fragment | first-fragment | non-or-first-fragment | small-fragment | non-first-fragment | ) ( routed-packet | ) ( options | ) ( packet-length *OPERATOR LENGTH* | ) ( time-range *TIME-RANGE-NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VSID | NVGRE vsid | 0-16777215 |
| VSID-MASK | NVGRE vsid mask、 | 0-0xFFFFFF |

| | | |
|---|---|---|
| SEQUENCE_NUM | The sequence number of the filter in IP ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| SRC_IP SRC_IP_MASK | The source IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any source IP address | - |
| host SRC_IP | The source IP address of a host | - |
| DST_IP DST_IP_MASK | The destination IP address and its wildcard bits | IPv4 Address |
| any | An — Destination IP address | - |
| host DST_IP | The destination IP address of a host | IPv4 Address |
| PRECEDENCE | Match packets with given precedence value | 0-7 |
| DSCP | Match packets with given dscp value | 0-63 |
| ECN | ecn value | 0-3 |
| non-fragment | Match packets with non fragment | - |
| first-fragment | Match packets with first fragment | - |
| non-or-first-fragment | Match packets with non first fragment | - |
| small-fragment | Match packets with small fragment | - |
| non-first-fragment | Match packets with non first fragment | - |
| routed-packet | Match routed packet | - |
| options | Match packets with IP options | - |
| TIME-RANGE-NAME | The time-range used by the filter | A string with up to 40 characters |
| OPERATOR | Packet length,operator including eq (equal to), lt (less than), gt (greater than), and range | eq (equal to), lt (less than), gt (greater than), and range |
| LENGTH | The length value | 64-16382 |

## Command Mode

Extend IP ACL Configuration

## Default

None

## Usage

This type of filter is mostly used to permit NVGRE packets.

## Examples

This example shows how to create a filter in extend IP ACL to permit any NVGRE packets:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1 extend
Switch(config-ex-ip-acl)# 1 permit nvgre any any vsid 0 mask 0
```

This example shows how to create a filter in extend IP ACL to permit the NVGRE packets with the source IP address 1.1.1.1, any destination IP address and the nvgre vsid is 10:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1 extend
Switch(config-ex-ip-acl)# 2 permit gre host 1.1.1.1 any vsid 10 mask 0xffffff
```

## Related Commands

no sequence-num

# 11.5.19 remark

## Command Purpose

Use this command to add remarks for the extend IP ACL.

To remove remarks from the extend IP ACL, use the no form of this command.

## Command Syntax

remark *REMARK*

no remark

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| REMARK | The remarks of the extend IP ACL | A string with up to 100 characters |

## Command Mode

Extend IP ACL Configuration

## Default

None

## Usage

The remark is up to 100 characters.

## Examples

This example shows how to add a remark to describe the extend IP ACL:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1 extend
Switch(config-ex-ip-acll)# remark remard0flist1
```

This example shows how to remove the remark from the extend IP ACL:

```
Switch# configure terminal
Switch(config)# ip access-list list_ipv4_1 extend
Switch(config-ex-ip-acll)# no remark
```

## Related Commands

None

# 11.5.20 show access-list ip extend

## Command Purpose

Use this command to show the information of extend IP ACL.

## Command Syntax

show access-list ip ( *ACL_NAME* extend | )

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| ACL_NAME extend | The name of the extend IP ACL | A string with up to 40 characters |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to show the information of extend IP ACL:

```
Switch# show access-list ip


ip access-list ex_ip_list_ipv4_1 extend
  2 permit tcp host 1.1.1.1 any
  3 deny icmp any any
  12 permit tcp any any
```

### Related Commands

ip access-list extend

## 11.6 ACLv6 Commands

### 11.6.1 ipv6 access-list

### Command Purpose

Use this command to create IPv6 ACL and then enter IPv6 ACL in global configuration mode.

## Command Syntax

ipv6 access-list *ACL_NAME*

no ipv6 access-list *ACL_NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ACL_NAME | The name of the IPv6 ACL | A string with up to 40 characters |

## Command Mode

Global Configuration

## Default

None

## Usage

If the system already has an IPv6 ACL with the same name, this command will enter the IPv6 ACL configuration mode. However, if the ACL name is used by other type of ACL, a prompt message will be shown.

When the name is not used by any ACL, this command is to create the IPv6 ACL firstly and then enter the IPv6 ACL configuration mode.

## Examples

This example shows how to create an IPv6 ACL named list_ipv6_1 and then enter the IPv6 ACL configuration mode:

```
Switch# configure terminal
Switch(config)# ipv6 access-list list_ipv6_1
Switch(config-ipv6-acl)#
```

This example shows how to remove the IPv6 ACL named list_ipv6_1:

```
Switch# configure terminal
Switch(config)# no ipv6 access-list list_ipv6_1
```

## Related Commands

match access-group

## 11.6.2 sequence-num

### Command Purpose

Use this command to remove a filter from IPv6 ACL.

### Command Syntax

no sequence-num *SEQUENCE_NUM*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SEQUENCE_NUM | The sequence number of a IPv6 filter | The range is 1 to 131071 |

### Command Mode

IPv6 ACL Configuration

### Default

None

### Usage

None

### Examples

This example shows how to remove a filter with the sequence-num 10 from IPv6 ACL:

```
Switch# configure terminal
Switch(config)# ipv6 access-list list_ipv6_1
Switch(config-ipv6-acl)# no sequence-num 10
```

### Related Commands

deny

deny tcp

deny udp

deny icmp

permit

permit tcp

permit udp

permit icmp

## 11.6.3 remark

### Command Purpose

Use this command to add remarks for the IPv6 ACL.

To remove remarks of the IPv6 ACL, use the no form of this command.

### Command Syntax

remark *REMARK*

no remark

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| REMARK | The remarks of the IPv6 ACL | String with up to 100 characters |

### Command Mode

IPv6 ACL Configuration

### Default

None

### Usage

The remarks are up to 100 characters. The exceed parts will not be stored and will be truncated.

## Examples

This example shows how to add a remark to describe the IPv6 ACL:

```
Switch# configure terminal
Switch(config)# ipv6 access-list list_ipv6_1
Switch(config-ipv6-acl)# remark remark of List for ipv6
```

This example shows how to remove the remark of the IPv6 ACL:

```
Switch# configure terminal
Switch(config)# ipv6 access-list list_ipv6_1
Switch(config-ipv6-acl)# no remark
```

## Related Commands

ipv6 access-list

# 11.6.4 deny

## Command Purpose

Use this command to discard ongoing IPv6 packets matching the IPv6 filter.

## Command Syntax

( *SEQUENCE_NUM* | ) deny ( *PROTO_NUM* | any ) ( *SRC_IPV6 SRC_IPV6_MASK* | any | host *SRC_IPV6* ) ( *DST_IPV6 DST_IPV6_MASK* | any | host *DST_IPV6* ) ( flow-label *FLOW_LABEL* | ) ( non-fragment | first-fragment | non-or-first-fragment | small-fragment | non-first-fragment | ) ( dscp *DSCP* | ) ( routed-packet | ) ( packet-length *OPERATOR LENGTH* | ) ( time-range *TIME-RANGE-NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SEQUENCE_NUM | The sequence number of the filter in IPv6 ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| PROTO_NUM | An IPv6 protocol number | 0-255 |
| any | Any IPv6 protocol | - |
| SRC_IPV6 SRC_IPV6_MASK | The source IPv6 prefix address | IPv6 Address and mask length |
| any | Any source host | - |

| | | |
|---|---|---|
| host SRC_IPV6 | The source IPv6 address of a host | IPv6 Address |
| DST_IPV6 DST_IPV6_MASK | The destination IPv6 prefix address | IPv6 Address and mask length |
| any | Any destination host | - |
| host DST_IPV6 | The destination IPv6 address of a host | IPv6 Address |
| flow-label FLOW_LABEL | Flow label number | 0-1048575 |
| non-fragment | Match packets with non fragment | - |
| first-fragment | Match packets with first fragment | - |
| non-or-first-fragment | Match packets with non first fragment | - |
| small-fragment | Match packets with small fragment | - |
| non-first-fragment | Match packets with non first fragment | - |
| DSCP | Match packets with given dscp value | 0-63 |
| routed-packet | Match routed packet | - |
| TIME-RANGE-NAME | The time-range used by the IPv6 filter | A string with up to 40 characters |
| OPERATOR | Packet length,operator including eq (equal to), lt (less than), gt (greater than), and range | eq (equal to), lt (less than), gt (greater than), and range |
| LENGTH | The length value | 64-16382 |

## Command Mode

IPv6 ACL Configuration

## Default

None

## Usage

An auto-generated sequence number will be assigned to the filter if the sequence-num field is not presented. The auto-generated sequence number is incremented by 10 on the maximum existing sequence number in the IPv6 ACL. For example,

when the maximum existing sequence number is 100, the sequence number of subsequent created IPv6 filter is 110.

### Examples

This example shows how to create a filter in IPv6 ACL to deny any IPv6 packets:

```
Switch# configure terminal
Switch(config)# ipv6 access-list list_ipv6_1
Switch(config-ipv6-acl)# 1 deny any any any
```

This example shows how to create a filter in IPv6 ACL to deny any routed packets:

```
Switch# configure terminal
Switch(config)# ipv6 access-list list_ipv6_1
Switch(config-ipv6-acl)# 2 deny any any any routed-packet
```

### Related Commands

no sequence-num

## 11.6.5 deny tcp

### Command Purpose

Use this command to reject TCP packets matching the IPv6 filter.

### Command Syntax

( *SEQUENCE_NUM* | ) deny tcp ( *SRC_IPV6 SRC_IPV6_MASK* | any | host *SRC_IPV6* ) ( src-port *OPERATOR SRC_PORT* | ) ( *DST_IPV6 DST_IPV6_MASK* | any | host *DST_IPV6* ) ( dst-port *OPERATOR DST_PORT* | ) ( flow-label *FLOW_LABEL* | ) ( non-fragment | first-fragment | non-or-first-fragment | small-fragment | non-first-fragment | ) ( dscp *DSCP* | ) ( routed-packet | ) ( packet-length *OPERATOR LENGTH* | ) ( time-range *TIME-RANGE-NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SEQUENCE_NUM | The sequence number of the filter in IPv6 ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |

| | | |
|---|---|---|
| SRC_IPV6 SRC_IPV6_MASK | The source IPv6 prefix address | IPv6 Address and mask length |
| any | Any destination host | - |
| host SRC_IPV6 | The source IPv6 address of a host | IPv6 Address |
| OPERATOR SRC_PORT | Source port operator and value | Source port, the range is 0-65535. Operator including eq (equal to), lt (less than), gt (greater than), neq (not equal to) and range |
| DST_IPV6 DST_IPV6_MASK | The destination IPv6 prefix address | IPv6 Address and mask length |
| any | | - |
| host DST_IPV6 | The destination IPv6 address of a host | IPv6 Address |
| OPERATOR DST_PORT | Destination port operator and value | Destination port, the range is 0-65535. Operator including eq (equal to), lt (less than), gt (greater than), neq (not equal to) and range |
| flow-label FLOW_LABEL | Flow label number | 0-1048575 |
| non-fragment | Match packets with non fragment | - |
| first-fragment | Match packets with first fragment | - |
| non-or-first-fragment | Match packets with non first fragment | - |
| small-fragment | Match packets with small fragment | - |
| non-first-fragment | Match packets with non first fragment | - |
| DSCP | Match packets with given dscp value | 0-63 |
| routed-packet | Match routed packet | - |
| TIME-RANGE-NAME | The time-range used by the IPv6 filter | A string with up to 40 characters |
| OPERATOR | Packet length,operator including eq (equal to), lt (less than), gt (greater than), and range | eq (equal to), lt (less than), gt (greater than), and range |
| LENGTH | The length value | 64-16382 |

### Command Mode

IPv6 ACL Configuration

### Default

None

### Usage

None

### Examples

This example shows how to create a filter in IPv6 ACL to deny any TCP packets:

```
Switch# configure terminal
Switch(config)# ipv6 access-list list_ipv6_1
Switch(config-ipv6-acl)# 1 deny tcp any any
```

This example shows how to create a filter in IPv6 ACL to deny the TCP packets with the source IPv6 address 2001::2020, source port 8080:

```
Switch# configure terminal
Switch(config)# ipv6 access-list list_ipv6_1
Switch(config-ipv6-acl)# 2 deny tcp host 2001::2020 src-port eq 8080 any
```

### Related Commands

no sequence-num

## 11.6.6 deny udp

### Command Purpose

Use this command to reject UDP packets matching the IPv6 filter.

### Command Syntax

( *SEQUENCE_NUM* | ) deny udp ( *SRC_IPV6 SRC_IPV6_MASK* | any | host *SRC_IPV6* ) ( src-port *OPERATOR SRC_PORT* | ) ( *DST_IPV6 DST_IPV6_MASK* | any | host *DST_IPV6* ) ( dst-port *OPERATOR DST_PORT* | ) ( flow-label *FLOW_LABEL* | ) ( non-fragment | first-fragment | non-or-first-fragment | small-fragment | non-first-

fragment | ) ( dscp *DSCP* | ) ( routed-packet | ) ( packet-length *OPERATOR LENGTH* | ) ( time-range *TIME-RANGE-NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SEQUENCE_NUM | The sequence number of the filter in IPv6 ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| SRC_IPV6 SRC_IPV6_MASK | The source IPv6 prefix address | IPv6 Address and mask length |
| any | Any destination host | - |
| host SRC_IPV6 | The source IPv6 address of a host | IPv6 Address |
| OPERATOR SRC_PORT | Source port operator and value | Source port, the range is 0-65535. Operator including eq (equal to), lt (less than), gt (greater than), neq (not equal to) and range |
| DST_IPV6 DST_IPV6_MASK | The destination IPv6 prefix address | IPv6 Address and mask length |
| any | | - |
| host DST_IPV6 | The destination IPv6 address of a host | IPv6 Address |
| OPERATOR DST_PORT | Destination port operator and value | Destination port, the range is 0-65535. Operator including eq (equal to), lt (less than), gt (greater than), neq (not equal to) and range |
| flow-label FLOW_LABEL | Flow label number | 0-1048575 |
| non-fragment | Match packets with non fragment | - |
| first-fragment | Match packets with first fragment | - |
| non-or-first-fragment | Match packets with non first fragment | - |
| small-fragment | Match packets with small fragment | - |
| non-first-fragment | Match packets with non first fragment | - |
| DSCP | Match packets with given dscp value | 0-63 |
| routed-packet | Match routed packet | - |

| | | |
|---|---|---|
| TIME-RANGE-NAME | The time-range used by the IPv6 filter | A string with up to 40 characters |
| OPERATOR | Packet length,operator including eq (equal to), lt (less than), gt (greater than), and range | eq (equal to), lt (less than), gt (greater than), and range |
| LENGTH | The length value | 64-16382 |

## Command Mode

IPv6 ACL Configuration

## Default

None

## Usage

None

## Examples

This example shows how to create a filter in IPv6 ACL to deny any UDP packets:

```
Switch# configure terminal
Switch(config)# ipv6 access-list list_ipv6_1
Switch(config-ipv6-acl)# 1 deny udp any any
```

This example shows how to create a filter in IPv6 ACL to deny the UDP packets with the source IPv6 address 2001::2020, source port 8080:

```
Switch# configure terminal
Switch(config)# ipv6 access-list list_ipv6_1
Switch(config-ipv6-acl)# 2 deny udp host 2001::2020 src-port eq 8080 any
```

## Related Commands

no sequence-num

# 11.6.7 deny icmp

## Command Purpose

Use this command to reject ICMP packets matching the IPv6 filter.

## Command Syntax

( *SEQUENCE_NUM* | ) deny icmp ( *SRC_IPV6 SRC_IPV6_MASK* | any | host *SRC_IPV6* ) ( *DST_IPV6 DST_IPV6_MASK* | any | host *DST_IPV6* ) ( icmp-type *TYPE-NUM* ( icmp-code *CODE-NUM* | ) | ) ( flow-label *FLOW_LABEL* | ) ( non-fragment | first-fragment | non-or-first-fragment | small-fragment | non-first-fragment | ) ( dscp *DSCP* | ) ( routed-packet | ) ( packet-length *OPERATOR LENGTH* | ) ( time-range *TIME-RANGE-NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| TYPE-NUM | ICMP message type | 0-255 |
| CODE-NUM | ICMP message code | 0-255 |
| SEQUENCE_NUM | The sequence number of the filter in IPv6 ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| SRC_IPV6 SRC_IPV6_MASK | The source IPv6 prefix address | IPv6 Address and mask length |
| any | Any source host | - |
| host SRC_IPV6 | The source IPv6 address of a host | IPv6 Address |
| DST_IPV6 DST_IPV6_MASK | The destination IPv6 prefix address | IPv6 Address and mask length |
| any | Any destination host | - |
| host DST_IPV6 | The destination IPv6 address of a host | IPv6 Address |
| flow-label FLOW_LABEL | Flow label number | 0-1048575 |
| non-fragment | Match packets with non fragment | - |
| first-fragment | Match packets with first fragment | - |
| non-or-first-fragment | Match packets with non first fragment | - |
| small-fragment | Match packets with small fragment | - |
| non-first-fragment | Match packets with non first fragment | - |
| DSCP | Match packets with given dscp value | 0-63 |
| routed-packet | Match routed packet | - |
| TIME-RANGE-NAME | The time-range used by the IPv6 filter | A string with up to 40 characters |

| | | |
|---|---|---|
| OPERATOR | Packet length,operator including eq (equal to), lt (less than), gt (greater than), and range | eq (equal to), lt (less than), gt (greater than), and range |
| LENGTH | The length value | 64-16382 |

## Command Mode

IPv6 ACL Configuration

## Default

None

## Usage

None

## Examples

This example shows how to create a filter in IPv6 ACL to deny any ICMP packets:

```
Switch# configure terminal
Switch(config)# ipv6 access-list list_ipv6_1
Switch(config-ipv6-acl)# 1 deny icmp any any
```

This example shows how to create a filter in IPv6 ACL to deny the ICMP packets with the icmp-type 3 and icmp-code 3:

```
Switch# configure terminal
Switch(config)# ipv6 access-list list_ipv6_1
Switch(config-ipv6-acl)# 2 deny icmp any any icmp-type 3 icmp-code 3
```

## Related Commands

no sequence-num

# 11.6.8 deny gre

## Command Purpose

Use this command to reject GRE packets matching the IPv6 filter.

## Command Syntax

( *SEQUENCE_NUM* | ) deny gre ( *SRC_IPV6 SRC_IPV6_MASK* | any | host *SRC_IPV6* ) ( *DST_IPV6 DST_IPV6_MASK* | any | host *DST_IPV6* ) ( flow-label *FLOW-LABEL-VALUE* | ) ( key *KEY* mask *KEY-MASK* ) ( dscp *DSCP* | ) ( ecn <0-3> | ) ( non-fragment | first-fragment | non-or-first-fragment | small-fragment | non-first-fragment | ) ( routed-packet | ) ( options | ) ( packet-length *OPERATOR LENGTH* | ) ( time-range *TIME-RANGE-NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| FLOW-LABEL-VALUE | Flow label | 0-1048575 |
| KEY | GRE key | 0-4294967295 |
| KEY-MASK | GRE key mask | 0-0xFFFFFFFF |
| SEQUENCE_NUM | The sequence number of the filter in IPv6 ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| SRC_IPV6 SRC_IPV6_MASK | The source IPv6 prefix address | IPv6 Address and mask length |
| any | Any source host | - |
| host SRC_IPV6 | The source IPv6 address of a host | IPv6 Address |
| DST_IPV6 DST_IPV6_MASK | The destination IPv6 prefix address | IPv6 Address and mask length |
| any | Any destination host | - |
| host DST_IPV6 | The destination IPv6 address of a host | IPv6 Address |
| routed-packet | Match routed packet | - |
| TIME-RANGE-NAME | The time-range used by the IPv6 filter | A string with up to 40 characters |
| OPERATOR | Packet length,operator including eq (equal to), lt (less than), gt (greater than), and range | eq (equal to), lt (less than), gt (greater than), and range |
| LENGTH | The length value | 64-16382 |
| ECN | ecn value | 0-3 |

## Command Mode

IPv6 ACL Configuration

## Default

None

## Usage

None

## Examples

```
Switch# configure terminal
Switch(config)# ipv6 access-list list_ipv6_1
Switch(config-ipv6-acl)# 1 deny gre any any key 0 mask 0

Switch# configure terminal
Switch(config)# ipv6 access-list list_ipv6_1
Switch(config-ipv6-acl)# 2 deny gre host 2000::1 any key 10 mask 0xffffffff
```

## Related Commands

no sequence-num

# 11.6.9 deny nvgre

## Command Purpose

Use this command to reject NVGRE packets matching the IPv6 filter.

## Command Syntax

( *SEQUENCE_NUM* | ) deny nvgre ( *SRC_IPV6 SRC_IPV6_MASK* | any | host *SRC_IPV6* ) ( *DST_IPV6 DST_IPV6_MASK* | any | host *DST_IPV6* ) ( flow-label *FLOW-LABEL-VALUE* | ) ( vsid *VSID* mask *VSID-MASK* ) ( dscp *DSCP* | ) ( ecn <0-3> | ) ( non-fragment | first-fragment | non-or-first-fragment | small-fragment | non-first-fragment | ) ( routed-packet | ) ( options | ) ( packet-length *OPERATOR LENGTH* | ) ( time-range *TIME-RANGE-NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| FLOW-LABEL-VALUE | Flow label | 0-1048575 |
| VSID | NVGRE VSID | 0-16777215 |
| VSID-MASK | NVGRE VSID MASK | 0-0xFFFFFF |

| | | |
|---|---|---|
| SEQUENCE_NUM | The sequence number of the filter in IPv6 ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| SRC_IPV6 SRC_IPV6_MASK | The source IPv6 prefix address | IPv6 Address and mask length |
| any | Any source host | - |
| host SRC_IPV6 | The source IPv6 address of a host | IPv6 Address |
| DST_IPV6 DST_IPV6_MASK | The destination IPv6 prefix address | IPv6 Address and mask length |
| any | Any destination host | - |
| host DST_IPV6 | The destination IPv6 address of a host | IPv6 Address |
| routed-packet | Match routed packet | - |
| TIME-RANGE-NAME | The time-range used by the IPv6 filter | A string with up to 40 characters |
| OPERATOR | Packet length,operator including eq (equal to), lt (less than), gt (greater than), and range | eq (equal to), lt (less than), gt (greater than), and range |
| LENGTH | The length value | 64-16382 |
| ECN | ecn value | 0-3 |

## Command Mode

IPv6 ACL Configuration

## Default

None

## Usage

None

## Examples

```
Switch# configure terminal
Switch(config)# ipv6 access-list list_ipv6_1
Switch(config-ipv6-acl)# 1 deny nvgre any any vsid 0 mask 0

Switch# configure terminal
```

```
Switch(config)# ipv6 access-list list_ipv6_1
Switch(config-ipv6-acl)# 2 deny gre host 2000::1 any vsid 10 mask 0xffffff
```

### Related Commands

no sequence-num

## 11.6.10 permit

### Command Purpose

Use this command to permit ongoing IPv6 packets matching the IPv6 filter.

### Command Syntax

( *SEQUENCE_NUM* | ) permit ( *PROTO_NUM* | any ) ( *SRC_IPV6 SRC_IPV6_MASK* | any | host *SRC_IPV6* ) ( *DST_IPV6 DST_IPV6_MASK* | any | host *DST_IPV6* ) ( flow-label *FLOW_LABEL* | ) ( non-fragment | first-fragment | non-or-first-fragment | small-fragment | non-first-fragment | ) ( dscp *DSCP* | ) ( routed-packet | ) ( packet-length *OPERATOR LENGTH* | ) ( time-range *TIME-RANGE-NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SEQUENCE_NUM | The sequence number of the filter in IPv6 ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| PROTO_NUM | An IPv6 protocol number | 0-255 |
| any | Any IPv6 protocol | - |
| SRC_IPV6 SRC_IPV6_MASK | The source IPv6 prefix address | IPv6 Address and mask length |
| any | Any source host | - |
| host SRC_IPV6 | The source IPv6 address of a host | IPv6 Address |
| DST_IPV6 DST_IPV6_MASK | The destination IPv6 prefix address | IPv6 Address and mask length |
| any | Any destination host | - |
| host DST_IPV6 | The destination IPv6 address of a host | IPv6 Address |
| flow-label FLOW_LABEL | Flow label number | 0-1048575 |
| non-fragment | Match packets with non fragment | - |

| | | |
|---|---|---|
| first-fragment | Match packets with first fragment | - |
| non-or-first-fragment | Match packets with non first fragment | - |
| small-fragment | Match packets with small fragment | - |
| non-first-fragment | Match packets with non first fragment | - |
| DSCP | Match packets with given dscp value | 0-63 |
| routed-packet | Match routed packet | - |
| TIME-RANGE-NAME | The time-range used by the IPv6 filter | A string with up to 40 characters |
| OPERATOR LENGTH | Packet length,operator including eq (equal to), lt (less than), gt (greater than), and range | eq (equal to), lt (less than), gt (greater than), and range |
| LENGTH | The length value | 64-16382 |

## Command Mode

IPv6 ACL Configuration

## Default

None

## Usage

An auto-generated sequence number will be assigned to the filter if the sequence-num field is not presented. The auto-generated sequence number is incremented by 10 on the maximum existing sequence number in the IPv6 ACL. For example, when the maximum existing sequence number is 100, the sequence number of subsequent created IPv6 filter is 110.

## Examples

This example shows how to create a filter in IPv6 ACL to permit any IPv6 packets:

```
Switch# configure terminal
Switch(config)# ipv6 access-list list_ipv6_1
Switch(config-ipv6-acl)# 1 permit any any any
```

This example shows how to create a filter in IPv6 ACL to permit any routed packets:

```
Switch# configure terminal
Switch(config)# ipv6 access-list list_ipv6_1
Switch(config-ipv6-acl)# 2 permit any any any routed-packet
```

### Related Commands

no sequence-num

## 11.6.11 permit tcp

### Command Purpose

Use this command to permitTCP packets matching the IPv6 filter.

### Command Syntax

( *SEQUENCE_NUM* | ) permit tcp ( *SRC_IPV6 SRC_IPV6_MASK* | any | host *SRC_IPV6* ) ( src-port *OPERATOR SRC_PORT* | ) ( *DST_IPV6 DST_IPV6_MASK* | any | host *DST_IPV6* ) ( dst-port *OPERATOR DST_PORT* | ) ( flow-label *FLOW_LABEL* | ) ( non-fragment | first-fragment | non-or-first-fragment | small-fragment | non-first-fragment | ) ( dscp *DSCP* | ) ( routed-packet | ) ( packet-length *OPERATOR LENGTH* | ) ( time-range *TIME-RANGE-NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SEQUENCE_NUM | The sequence number of the filter in IPv6 ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| SRC_IPV6 SRC_IPV6_MASK | The source IPv6 prefix address | IPv6 Address and mask length |
| any | Any destination host | - |
| host SRC_IPV6 | The source IPv6 address of a host | IPv6 Address |
| OPERATOR SRC_PORT | Source port operator and value | Source port, the range is 0-65535. Operator including eq (equal to), lt (less than), gt (greater than), neq (not equal to) and range |
| DST_IPV6 DST_IPV6_MASK | The destination IPv6 prefix address | IPv6 Address and mask length |
| any | | - |

| | | |
|---|---|---|
| host DST_IPV6 | The destination IPv6 address of a host | IPv6 Address |
| OPERATOR DST_PORT | Destination port operator and value | Destination port, the range is 0-65535. Operator including eq (equal to), lt (less than), gt (greater than), neq (not equal to) and range |
| flow-label FLOW_LABEL | Flow label number | 0-1048575 |
| non-fragment | Match packets with non fragment | - |
| first-fragment | Match packets with first fragment | - |
| non-or-first-fragment | Match packets with non first fragment | - |
| small-fragment | Match packets with small fragment | - |
| non-first-fragment | Match packets with non first fragment | - |
| DSCP | Match packets with given dscp value | 0-63 |
| routed-packet | Match routed packet | - |
| TIME-RANGE-NAME | The time-range used by the IPv6 filter | A string with up to 40 characters |
| OPERATOR | Packet length,operator including eq (equal to), lt (less than), gt (greater than), and range | eq (equal to), lt (less than), gt (greater than), and range |
| LENGTH | The length value | 64-16382 |

## Command Mode

IPv6 ACL Configuration

## Default

None

## Usage

None

## Examples

This example shows how to create a filter in IPv6 ACL to permit any TCP packets:

```
Switch# configure terminal
Switch(config)# ipv6 access-list list_ipv6_1
Switch(config-ipv6-acl)# 1 permit tcp any any
```

This example shows how to create a filter in IPv6 ACL to permit the TCP packets with the source IPv6 address 2001::2020, source port 8080:

```
Switch# configure terminal
Switch(config)# ipv6 access-list list_ipv6_1
Switch(config-ipv6-acl)# 2 permit tcp host 2001::2020 src-port eq 8080 any
```

## Related Commands

no sequence-num

# 11.6.12 permit udp

## Command Purpose

Use this command to permit UDP packets matching the IPv6 filter.

## Command Syntax

( *SEQUENCE_NUM* | ) permit udp ( *SRC_IPV6 SRC_IPV6_MASK* | any | host *SRC_IPV6* ) ( src-port *OPERATOR SRC_PORT* | ) ( *DST_IPV6 DST_IPV6_MASK* | any | host *DST_IPV6* ) ( dst-port *OPERATOR DST_PORT* | ) ( flow-label *FLOW_LABEL* | ) ( non-fragment | first-fragment | non-or-first-fragment | small-fragment | non-first-fragment | ) ( dscp *DSCP* | ) ( routed-packet | ) ( packet-length *OPERATOR LENGTH* | ) ( time-range *TIME-RANGE-NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SEQUENCE_NUM | The sequence number of the filter in IPv6 ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| SRC_IPV6 SRC_IPV6_MASK | The source IPv6 prefix address | IPv6 Address and mask length |
| any | Any destination host | - |

| | | |
|---|---|---|
| host SRC_IPV6 | The source IPv6 address of a host | IPv6 Address |
| OPERATOR SRC_PORT | Source port operator and value | Source port, the range is 0-65535. Operator including eq (equal to), lt (less than), gt (greater than), neq (not equal to) and range |
| DST_IPV6 DST_IPV6_MASK | The destination IPv6 prefix address | IPv6 Address and mask length |
| any | | - |
| host DST_IPV6 | The destination IPv6 address of a host | IPv6 Address |
| OPERATOR DST_PORT | Destination port operator and value | Destination port, the range is 0-65535. Operator including eq (equal to), lt (less than), gt (greater than), neq (not equal to) and range |
| flow-label FLOW_LABEL | Flow label number | 0-1048575 |
| non-fragment | Match packets with non fragment | - |
| first-fragment | Match packets with first fragment | - |
| non-or-first-fragment | Match packets with non first fragment | - |
| small-fragment | Match packets with small fragment | - |
| non-first-fragment | Match packets with non first fragment | - |
| DSCP | Match packets with given dscp value | 0-63 |
| routed-packet | Match routed packet | - |
| TIME-RANGE-NAME | The time-range used by the IPv6 filter | A string with up to 40 characters |
| OPERATOR | Packet length,operator including eq (equal to), lt (less than), gt (greater than), and range | eq (equal to), lt (less than), gt (greater than), and range |
| LENGTH | The length value | 64-16382 |

## Command Mode

IPv6 ACL Configuration

### Default

None

### Usage

None

### Examples

This example shows how to create a filter in IPv6 ACL to permit any UDP packets:

```
Switch# configure terminal
Switch(config)# ipv6 access-list list_ipv6_1
Switch(config-ipv6-acl)# 1 permit udp any any
```

This example shows how to create a filter in IPv6 ACL to permit the UDP packets with the source IPv6 address 2001::2020, source port 8080:

```
Switch# configure terminal
Switch(config)# ipv6 access-list list_ipv6_1
Switch(config-ipv6-acl)# 2 permit udp host 2001::2020 src-port eq 8080 any
```

### Related Commands

no sequence-num

## 11.6.13 permit icmp

### Command Purpose

Use this command to reject ICMP packets matching the IPv6 filter.

### Command Syntax

( *SEQUENCE_NUM* | ) permit icmp ( *SRC_IPV6 SRC_IPV6_MASK* | any | host *SRC_IPV6* ) ( *DST_IPV6 DST_IPV6_MASK* | any | host *DST_IPV6* ) ( icmp-type *TYPE-NUM* ( icmp-code *CODE-NUM* | ) | ) ( flow-label *FLOW_LABEL* | ) ( non-fragment | first-fragment | non-or-first-fragment | small-fragment | non-first-fragment | ) ( dscp *DSCP* | ) ( routed-packet | ) ( packet-length *OPERATOR LENGTH* | ) ( time-range *TIME-RANGE-NAME* | )

其他参数说明请见上文“permit”部分描述。

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| icmp-type TYPE-NUM | ICMP message type | 0-255 |
| icmp-code CODE-NUM | ICMP message code | 0-255 |
| SEQUENCE_NUM | The sequence number of the filter in IPv6 ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| SRC_IPV6 SRC_IPV6_MASK | The source IPv6 prefix address | IPv6 Address and mask length |
| any | Any source host | - |
| host SRC_IPV6 | The source IPv6 address of a host | IPv6 Address |
| DST_IPV6 DST_IPV6_MASK | The destination IPv6 prefix address | IPv6 Address and mask length |
| any | Any destination host | - |
| host DST_IPV6 | The destination IPv6 address of a host | IPv6 Address |
| flow-label FLOW_LABEL | Flow label number | 0-1048575 |
| non-fragment | Match packets with non fragment | - |
| first-fragment | Match packets with first fragment | - |
| non-or-first-fragment | Match packets with non first fragment | - |
| small-fragment | Match packets with small fragment | - |
| non-first-fragment | Match packets with non first fragment | - |
| DSCP | Match packets with given dscp value | 0-63 |
| routed-packet | Match routed packet | - |
| TIME-RANGE-NAME | The time-range used by the IPv6 filter | A string with up to 40 characters |
| OPERATOR | Packet length,operator including eq (equal to), lt (less than), gt (greater than), and range | eq (equal to), lt (less than), gt (greater than), and range |
| LENGTH | The length value | 64-16382 |

## Command Mode

IPv6 ACL Configuration

## Default

None

## Usage

None

## Examples

This example shows how to create a filter in IPv6 ACL to permit any ICMP packets:

```
Switch# configure terminal
Switch(config)# ipv6 access-list list_ipv6_1
Switch(config-ipv6-acl)# 1 permit icmp any any
```

This example shows how to create a filter in IPv6 ACL to permit the ICMP packets with the icmp-type 3 and icmp-code 3:

```
Switch# configure terminal
Switch(config)# ipv6 access-list list_ipv6_1
Switch(config-ipv6-acl)# 2 permit icmp any any icmp-type 3 icmp-code 3
```

## Related Commands

no sequence-num

# 11.6.14 permit gre

## Command Purpose

Use this command to permit GRE packets matching the IPv6 filter.

## Command Syntax

( *SEQUENCE_NUM* | ) permit gre ( *SRC_IPV6 SRC_IPV6_MASK* | any | host *SRC_IPV6* ) ( *DST_IPV6 DST_IPV6_MASK* | any | host *DST_IPV6* ) ( flow-label *FLOW-LABEL-VALUE* | ) ( key *KEY* mask *KEY-MASK* ) ( dscp *DSCP* | ) ( ecn <0-3> | ) ( non-fragment | first-fragment | non-or-first-fragment | small-fragment | non-first-fragment | ) ( routed-packet | ) ( options | ) ( packet-length *OPERATOR LENGTH* | ) ( time-range *TIME-RANGE-NAME* | )

其他参数说明请见上文“deny gre”。

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| FLOW-LABEL-VALUE | Flow label | 0-1048575 |
| KEY | GRE key | 0-4294967295 |
| KEY-MASK | GRE key mask | 0-0xFFFFFFFF |
| SEQUENCE_NUM | The sequence number of the filter in IPv6 ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| SRC_IPV6 SRC_IPV6_MASK | The source IPv6 prefix address | IPv6 Address and mask length |
| any | Any source host | - |
| host SRC_IPV6 | The source IPv6 address of a host | IPv6 Address |
| DST_IPV6 DST_IPV6_MASK | The destination IPv6 prefix address | IPv6 Address and mask length |
| any | Any destination host | - |
| host DST_IPV6 | The destination IPv6 address of a host | IPv6 Address |
| routed-packet | Match routed packet | - |
| TIME-RANGE-NAME | The time-range used by the IPv6 filter | A string with up to 40 characters |
| OPERATOR | Packet length,operator including eq (equal to), lt (less than), gt (greater than), and range | eq (equal to), lt (less than), gt (greater than), and range |
| LENGTH | The length value | 64-16382 |
| ECN | ecn value | 0-3 |

## Command Mode

IPv6 ACL Configuration

## Default

None

## Usage

None

### Examples

```
Switch# configure terminal
Switch(config)# ipv6 access-list list_ipv6_1
Switch(config-ipv6-acl)# 1 permit gre any any key 0 mask 0

Switch# configure terminal
Switch(config)# ipv6 access-list list_ipv6_1
Switch(config-ipv6-acl)# 2 permit gre host 2000::1 any key 10 mask 0xffffffff
```

### Related Commands

no sequence-num

## 11.6.15 permit nvgre

### Command Purpose

Use this command to permit NVGRE packets matching the IPv6 filter.

### Command Syntax

( *SEQUENCE_NUM* | ) permit nvgre ( *SRC_IPV6 SRC_IPV6_MASK* | any | host *SRC_IPV6* ) ( *DST_IPV6 DST_IPV6_MASK* | any | host *DST_IPV6* ) ( flow-label *FLOW-LABEL-VALUE* | ) ( vsid *VSID* mask *VSID-MASK* ) ( dscp *DSCP* | ) ( ecn <0-3> | ) ( non-fragment | first-fragment | non-or-first-fragment | small-fragment | non-first-fragment | ) ( routed-packet | ) ( options | ) ( packet-length *OPERATOR LENGTH* | ) ( time-range *TIME-RANGE-NAME* | )

其他参数说明请见上文“deny nvgre”。

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| FLOW-LABEL-VALUE | Flow label | 0-1048575 |
| VSID | NVGRE VSID | 0-16777215 |
| VSID-MASK | NVGRE VSID MASK | 0-0xFFFFFF |
| SEQUENCE_NUM | The sequence number of the filter in IPv6 ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| SRC_IPV6 SRC_IPV6_MASK | The source IPv6 prefix address | IPv6 Address and mask length |
| any | Any source host | - |

| | | |
|---|---|---|
| host SRC_IPV6 | The source IPv6 address of a host | IPv6 Address |
| DST_IPV6 DST_IPV6_MASK | The destination IPv6 prefix address | IPv6 Address and mask length |
| any | Any destination host | - |
| host DST_IPV6 | The destination IPv6 address of a host | IPv6 Address |
| routed-packet | Match routed packet | - |
| TIME-RANGE-NAME | The time-range used by the IPv6 filter | A string with up to 40 characters |
| OPERATOR | Packet length,operator including eq (equal to), lt (less than), gt (greater than), and range | eq (equal to), lt (less than), gt (greater than), and range |
| LENGTH | The length value | 64-16382 |
| ECN | ecn value | 0-3 |

## Command Mode

IPv6 ACL Configuration

## Default

None

## Usage

None

## Examples

```
Switch# configure terminal
Switch(config)# ipv6 access-list list_ipv6_1
Switch(config-ipv6-acl)# 1 permit nvgre any any vsid 0 mask 0

Switch# configure terminal
Switch(config)# ipv6 access-list list_ipv6_1
Switch(config-ipv6-acl)# 2 permit gre host 2000::1 any vsid 10 mask 0xffffff
```

## Related Commands

no sequence-num

# 11.6.16 show access-list ipv6

## Command Purpose

Use this command to show the IPv6 ACL information.

## Command Syntax

show access-list ipv6 ( *ACL_NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ACL_NAME | The name of the IPv6 ACL | A string with up to 40 characters |

## Command Mode

Privileged EXEC

## Default

None

## Usage

If no ipv6 acl are specified, all ipv6 access-lists in the system should be shown.

## Examples

This example shows how to show the IPv6 ACL information:

```
Switch# show access-list ipv6
ipv6 access-list list_ipv6_1
  10 deny any 2001::/48 any
  20 permit any any any
```

## Related Commands

ipv6 access-list

# 11.7 Port Group Commands

## 11.7.1 port-group

### Command Purpose

Use this command to create port group and then enter port group in global configuration mode. Use no port-group command to delete the port group.

### Command Syntax

port-group *PORT_GROUP_NAME*

no port-group *PORT_GROUP_NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PORT_GROUP_NAME | The name of the port group | A string with up to 32 characters |

### Command Mode

Global Configuration

### Default

None

### Usage

If the system already has a port group with the same name, this command will enter the port group configuration mode.

When the name is not used by any port group, this command is to create the port group firstly and then enter the port group configuration mode.

### Examples

This example shows how to create a port group named port_group_1 and then enter the port group configuration mode:

```
Switch# configure terminal
Switch(config)# port-group port_group_1
Switch(config-port-group)#
```

This example shows how to remove the port group named list_mac_1:

```
Switch# configure terminal
Switch(config)# no port-group port_group_1
```

### Related Commands

None

## 11.7.2 member interface

### Command Purpose

Use this command to add a physical interface or an aggregation interface to port group. Use no member interface command to delete the physical interface or aggregation interface.

### Command Syntax

member interface ( *IFPHYSICAL* | *IFAGG* )

no member interface

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFPHYSICAL | The name of the physical interface | Support physical ports |
| IFAGG | The name of the aggregation interface | Support aggregation ports |

### Command Mode

Port-group Configuration

### Default

None

### Usage

If the interface is already an aggregation member interface, it cannot be added. If the interface has already been added to another port group, it cannot be added.

### Examples

This example shows how to create a member interface :

```
Switch# configure terminal
Switch(config)# port-group port_group_1
Switch(config-port-group)# member interface eth-0-1
```

This example shows how to remove the member interface :

```
Switch# configure terminal
Switch(config)# port-group port_group_1
Switch(config-port-group)# no member interface eth-0-1
```

### Related Commands

None

## 11.8 Vlan Group Commands

### 11.8.1 vlan-group

### Command Purpose

Use this command to create vlan group and then enter vlan group in global configuration mode. Use no vlan-group command to delete the vlan group.

### Command Syntax

vlan-group *VLAN_GROUP_NAME*

no vlan-group *VLAN_GROUP_NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_GROUP_NAME | The name of the vlan group | A string with up to 32 characters |

## Command Mode

Global Configuration

## Default

None

## Usage

If the system already has a vlan group with the same name, this command will enter the vlan group configuration mode.

When the name is not used by any vlan group, this command is to create the vlan group firstly and then enter the vlan group configuration mode.

## Examples

This example shows how to create a vlan group named vlan_group_1 and then enter the vlan group configuration mode:

```
Switch# configure terminal
Switch(config)# vlan-group vlan_group_1
Switch(config-vlan-group)#
```

This example shows how to remove the vlan group named vlan_group_1:

```
Switch# configure terminal
Switch(config)# no vlan-group vlan_group_1
```

## Related Commands

None

# 11.8.2 member vlan

## Command Purpose

Use this command to add a vlan to vlan group. Use no member vlan command to delete the vlan.

## Command Syntax

member vlan *VLAN_ID*

no member vlan

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | The vlan id | 1-4094 |

## Command Mode

Vlan-group Configuration

## Default

None

## Usage

If the vlan has already been added to another vlan group, it cannot be added.

## Examples

This example shows how to create a member vlan:

```
Switch# configure terminal
Switch(config)# vlan-group vlan_group_1
Switch(config-vlan-group)# member vlan 10
```

This example shows how to remove the member vlan :

```
Switch# configure terminal
Switch(config)# vlan-group vlan_group_1
Switch(config-vlan-group)# no member vlan 10
```

## Related Commands

None

# 11.9 global acl Commands

## 11.9.1 global-acl enable

### Command Purpose

Use this command to enable global acl.

Use the no form to disable global acl.

### Command Syntax

global-acl enable

no global-acl enable

### Command Mode

Global Configuration

### Default

None

### Usage

Configuration about global-acl has been stored, but cannot take effect until the next reload.

### Examples

The following example shows how to enable global acl.:

```
Switch# configure terminal
Switch(config)# global-acl enable
```

### Related Commands

None

## 11.9.2 service-policy global

### Command Purpose

Use this command to apply the global acl policy.

Use the no form of this command to remove it.

### Command Syntax

service-policy global ( input | output ) *NAME*

no service-policy global ( input | output )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| input | Ingress | - |
| output | Egress | - |
| NAME | Policy map name | A string with up to 40 characters |

### Command Mode

Global Configuration

### Default

None

### Usage

None

### Examples

The following example shows how to set global acl policy.:

```
Switch# configure terminal
Switch(config)# service-policy global input pmap
```

### Related Commands

None

## 11.9.3 access-group global

### Command Purpose

Use this command to apply the global acl access group.

Use the no form of this command to remove it.

### Command Syntax

access-group global ( input | output ) *NAME*

no access-group global ( input | output )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| input | Ingress | - |
| output | Egress | - |
| NAME | Access group name | A string with up to 40 characters |

### Command Mode

Global Configuration

### Default

None

### Usage

None

### Examples

The following example shows how to set global acl access group.:

```
Switch# configure terminal
Switch(config)# access-group global input aaa
```

### Related Commands

None

## 11.9.4 show policy-map statistics global ace

### Command Purpose

Use this command to show stats of global acl ace

### Command Syntax

show policy-map statistics global ( input | output ) ace ( class-based | ace-based ) ( class *NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| input | Ingress | - |
| output | Egress | - |
| NAME | Specify class map name | A string with up to 40 characters |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following example shows how to show stats of global acl ace:

```
Switch # show policy-map statistics global input ace
```

### Related Commands

None

## 11.9.5 show policy-map statistics global policer

### Command Purpose

Use this command to show stats of global acl policer

### Command Syntax

show policy-map statistics global ( input | output ) policer ( class *NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| input | Ingress | - |
| output | Egress | - |
| NAME | Specify class map name | A string with up to 40 characters |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following example shows how to show stats of global acl policer:

```
Switch# show policy-map statistics global input policer
```

### Related Commands

None

## 11.9.6 clear policy-map statistics global ace

### Command Purpose

Use this command to clear stats of global acl ace

### Command Syntax

clear policy-map statistics global ( input | output ) ace

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| input | Ingress | - |
| output | Egress | - |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following example shows how to clear stats of global acl ace:

```
Switch# clear policy-map statistics global input ace
```

### Related Commands

None

# 11.9.7 clear policy-map statistics global policer

## Command Purpose

Use this command to clear stats of global acl policer

## Command Syntax

clear policy-map statistics global ( input | output ) policer

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| input | Ingress | - |
| output | Egress | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following example shows how to clear stats of global acl policer:

```
Switch# clear policy-map statistics global input policer
```

## Related Commands

None

# 11.10 COPP Commands

## 11.10.1 control-plane access-list

### Command Purpose

Use this command to create a control-plane access list.

Use the no form to delete the access list.

### Command Syntax

control-plane access-list *NAME*

no control-plane access-list *NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | Specify access list name | A string with up to 40 characters |

### Command Mode

Global Configuration

### Default

None

### Usage

None

### Examples

The following example shows how to create a control-plane access list.:

```
Switch # configure terminal
Switch (config)# control-plane access-list test
Switch (config-cp-acl)# quit
```

### Related Commands

match access-group

# 11.10.2 (deny | permit) exception any

## Command Purpose

Use deny command to discard any type of packets to the cpu.

Use permit command to let any type of packets to the cpu pass

## Command Syntax

( *SEQUENCE_NUM* | ) ( deny | permit ) exception any ( time-range *TIME_RANGE_NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SEQUENCE_NUM | The sequence number of the filter in CoPP ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| TIME_RANGE_NAME | The time-range used by the IP filter | A string with up to 40 characters |

## Command Mode

Config-cp-acl

## Default

None

## Usage

None

## Examples

The following example shows how to discard any type of packets to the cpu.:

```
Switch# configure terminal
Switch (config)# control-plane access-list test
Switch (config-cp-acl)#deny exception any
Switch (config-cp-acl)#
```

## Related Commands

Control-plane access-list

# 11.10.3 (deny | permit) exception ipda

## Command Purpose

Use deny command to discard ipda type of packets to the cpu.

Use permit command to let ipda type of packets to the cpu pass

## Command Syntax

( *SEQUENCE_NUM* | ) deny | permit exception ipda ( untag-vlan | { vlan *VLAN_ID* | cos *COS* } | ) ( time-range *NAME* | )

( *SEQUENCE_NUM* | ) deny | permit exception ipda ( untag-vlan | { vlan *VLAN_ID* | cos *COS* } | ) ( ipv4 ) ( <0-255> | any ) ( *IP_ADDR IP_MASK* | any | host *IP_ADDR* ) ( any ) ( time-range *NAME* | )

( *SEQUENCE_NUM* | ) deny | permit exception ipda ( untag-vlan | { vlan *VLAN_ID* | cos *COS* } | ) ( ipv4 ) ( icmp ) ( *IP_ADDR IP_MASK* | any | host *IP_ADDR* ) ( any ) ( icmp-type *IGMP_TYPE* ( icmp-code *ICMP_CODE* | ) | ) ( time-range *NAME* | )

( *SEQUENCE_NUM* | ) deny | permit exception ipda ( untag-vlan | { vlan *VLAN_ID* | cos *COS* } | ) ( ipv4 ) ( udp ) ( *IP_ADDR IP_MASK* | any | host *IP_ADDR* ) ( any ) ( src-port ( eq *L4_PORT* ) | ) ( dst-port ( eq *L4_PORT* ) | ) ( time-range *NAME* | )

( *SEQUENCE_NUM* | ) deny | permit exception ipda ( untag-vlan | { vlan *VLAN_ID* | cos *COS* } | ) ( ipv4 ) ( gre ) ( *IP_ADDR IP_MASK* | any | host *IP_ADDR* ) ( any ) ( time-range *NAME* | )

( *SEQUENCE_NUM* | ) deny | permit exception ipda ( untag-vlan | { vlan *VLAN_ID* | cos *COS* } | ) ( ipv6 ) ( <0-255> | any ) ( any ) ( any ) ( time-range *NAME* | )

( *SEQUENCE_NUM* | ) deny | permit exception ipda ( untag-vlan | { vlan *VLAN_ID* | cos *COS* } | ) ( ipv6 ) ( icmp ) ( any ) ( any ) ( icmp-type *IGMP_TYPE* ( icmp-code *ICMP_CODE* | ) | ) ( time-range *NAME* | )

( *SEQUENCE_NUM* | ) deny | permit exception ipda ( untag-vlan | { vlan *VLAN_ID* | cos *COS* } | ) ( ipv6 ) ( udp ) ( any ) ( any ) ( src-port ( eq *L4_PORT* ) | ) ( dst-port ( eq *L4_PORT* ) | ) ( time-range *NAME* | )

( *SEQUENCE_NUM* | ) ( deny | permit ) exception ipda ( untag-vlan | { vlan *VLAN_ID* | cos *COS* } | ) ( ipv6 ) ( gre ) ( any ) ( any ) ( time-range *NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SEQUENCE_NUM | The sequence number of the filter in CoPP ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| VLAN_ID | VLAN ID | 1-4094 |
| COS | The range of cos is from 0 to 7 | 0-7 |
| any | Any source host | - |
| host IP_ADDR | The source IP address of a host | IPv4 Address |
| eq | Equal to | - |
| ICMP_TYPE | Icmp type | 0-255 |

## Command Mode

Config-cp-acl

## Default

None

## Usage

None

## Examples

The following example shows how to discard ipda type of packets to the cpu.:

```
Switch# configure terminal
Switch (config)# control-plane access-list test
Switch (config-cp-acl)#deny exception ipda
Switch (config-cp-acl)#
```

## Related Commands

Control-plane access-list

# 11.10.4 (deny | permit) exception fwd-to-cpu

## Command Purpose

Use deny command to discard fwd-to-cpu type of packets to the cpu.

Use permit command to let fwd-to-cpu type of packets to the cpu pass

## Command Syntax

( *SEQUENCE_NUM* | ) deny | permit exception fwd-to-cpu ( untag-vlan | { vlan *VLAN_ID* | cos *COS* } | ) ( time-range *NAME* | )

( *SEQUENCE_NUM* | ) deny | permit exception fwd-to-cpu ( untag-vlan | { vlan *VLAN_ID* | cos *COS* } | ) ( ipv4 ) ( <0-255> | any ) ( *IP_ADDR IP_MASK* | any | host *IP_ADDR* ) ( any ) ( time-range *NAME* | )

( *SEQUENCE_NUM* | ) deny | permit exception fwd-to-cpu ( untag-vlan | { vlan *VLAN_ID* | cos *COS* } | ) ( ipv4 ) ( icmp ) ( *IP_ADDR IP_MASK* | any | host *IP_ADDR* ) ( any ) ( icmp-type *IGMP_TYPE* ( icmp-code *ICMP_CODE* | ) | ) ( time-range *NAME* | )

( *SEQUENCE_NUM* | ) deny | permit exception fwd-to-cpu ( untag-vlan | { vlan *VLAN_ID* | cos *COS* } | ) ( ipv4 ) ( tcp ) ( *IP_ADDR IP_MASK* | any | host *IP_ADDR* ) ( any ) ( src-port ( eq *L4_PORT* ) | ) ( dst-port ( eq *L4_PORT* ) | ) ( time-range *NAME* | )

( *SEQUENCE_NUM* | ) deny | permit exception fwd-to-cpu ( untag-vlan | { vlan *VLAN_ID* | cos *COS* } | ) ( ipv4 ) ( udp ) ( *IP_ADDR IP_MASK* | any | host *IP_ADDR* ) ( any ) ( src-port ( eq *L4_PORT* ) | ) ( dst-port ( eq *L4_PORT* ) | ) ( time-range *NAME* | )

( *SEQUENCE_NUM* | ) deny | permit exception fwd-to-cpu ( untag-vlan | { vlan *VLAN_ID* | cos *COS* } | ) ( ipv4 ) ( gre ) ( *IP_ADDR IP_MASK* | any | host *IP_ADDR* ) ( any ) ( time-range *NAME* | )

( *SEQUENCE_NUM* | ) deny | permit exception fwd-to-cpu ( untag-vlan | { vlan *VLAN_ID* | cos *COS* } | ) ( ipv6 ) ( <0-255> | any ) ( any ) ( any ) ( time-range *NAME* | )

( *SEQUENCE_NUM* | ) deny | permit exception fwd-to-cpu ( untag-vlan | { vlan *VLAN_ID* | cos *COS* } | ) ( ipv6 ) ( icmp ) ( any ) ( any ) ( icmp-type *IGMP_TYPE* ( icmp-code *ICMP_CODE* | ) | ) ( time-range *NAME* | )

( *SEQUENCE_NUM* | ) deny | permit exception fwd-to-cpu ( untag-vlan | { vlan *VLAN_ID* | cos *COS* } | ) ( ipv6 ) ( tcp ) ( any ) ( any ) ( src-port ( eq *L4_PORT* ) | ) ( dst-port ( eq *L4_PORT* ) | ) ( time-range *NAME* | )

( *SEQUENCE_NUM* | ) deny | permit exception fwd-to-cpu ( untag-vlan | { vlan *VLAN_ID* | cos *COS* } | ) ( ipv6 ) ( udp ) ( any ) ( any ) ( src-port ( eq *L4_PORT* ) | ) ( dst-port ( eq *L4_PORT* ) | ) ( time-range *NAME* | )

( *SEQUENCE_NUM* | ) deny | permit exception fwd-to-cpu ( untag-vlan | { vlan *VLAN_ID* | cos *COS* } | ) ( ipv6 ) ( gre ) ( any ) ( any ) ( time-range *NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SEQUENCE_NUM | The sequence number of the filter in CoPP ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| VLAN_ID | The range of vlan id is from 1 to 4094 | 1-4094 |
| COS | The range of cos is from 0 to 7 | 0-7 |
| IP_ADDR IP_MASK | The source IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any source host | - |
| host IP_ADDR | The source IP address of a host | IPv4 Address |
| eq | Equal to | - |
| ICMP_TYPE | ICMP type | 0-255 |
| ICMP_CODE | The range of icmp-code is from 0-255 | 0-255 |

## Command Mode

Config-cp-acl

### Default

None

### Usage

None

### Examples

The following example shows how to discard fwd-to-cpu type of packets to the cpu.:

```
Switch# configure terminal
Switch (config)# control-plane access-list test
Switch (config-cp-acl)#deny exception fwd-to-cpu
Switch (config-cp-acl)#
```

### Related Commands

Control-plane access-list

## 11.10.5 (deny | permit) exception slow-protocol

### Command Purpose

Use deny command to discard slow-protocol type of packets to the cpu.

Use permit command to let slow-protocol type of packets to the cpu pass

### Command Syntax

( *SEQUENCE_NUM* | ) deny | permit exception slow-protocol ( time-range *NAME* | )

( *SEQUENCE_NUM* | ) deny | permit exception slow-protocol ( sub-type *TYPE* ) ( time-range *NAME* | )

( *SEQUENCE_NUM* | ) deny | permit exception slow-protocol ( efm | lacp | synce ) ( time-range *NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SEQUENCE_NUM | The sequence number of the filter in CoPP ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| TYPE | The range of sub-type is from 0 to 255 | 0-255 |
| efm | efm type message | - |
| lacp | lacp type message | - |
| synce | synce type message | - |

## Command Mode

Config-cp-acl

## Default

None

## Usage

None

## Examples

The following example shows how to discard slow-protocol type of packets to the cpu.:

```
Switch# configure terminal
Switch (config)# control-plane access-list test
Switch (config-cp-acl)#deny exception slow-protocol
Switch (config-cp-acl)#
```

## Related Commands

Control-plane access-list

# 11.10.6 (deny | permit) exception dhcp

## Command Purpose

Use deny command to discard dhcp type of packets to the cpu.

Use permit command to let dhcp type of packets to the cpu pass

## Command Syntax

( *SEQUENCE_NUM* | ) deny | permit exception dhcp ( time-range *NAME* | ) ( *SEQUENCE_NUM* | ) deny | permit exception dhcp ( dhcp ) ( *IP_ADDR IP_MASK* | any | host *IP_ADDR* ) ( any ) ( client | server | ) ( time-range *NAME* | )

( *SEQUENCE_NUM* | ) deny | permit exception dhcp ( dhcpv6 ) ( any ) ( any ) ( reply | request | ) ( time-range *NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SEQUENCE_NUM | The sequence number of the filter in CoPP ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| IP_ADDR IP_MASK | The source IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any IP address | - |
| host IP_ADDR | The source IP address of a host | IPv4 Address |
| client | dhcp request type message | - |
| server | dhcp reply type message | - |
| request | dhcp client type message | - |
| reply | dhcp server type message | - |

## Command Mode

Config-cp-acl

## Default

None

## Usage

None

## Examples

The following example shows how to discard dhcp type of packets to the cpu.:

```
Switch# configure terminal
Switch (config)# control-plane access-list test
Switch (config-cp-acl)#deny exception dhcp dhcp any any
Switch (config-cp-acl)#
```

## Related Commands

Control-plane access-list

# 11.10.7 (deny | permit) exception rip

## Command Purpose

Use deny command to discard rip type of packets to the cpu.

Use permit command to let rip type of packets to the cpu pass

## Command Syntax

( *SEQUENCE_NUM* | ) deny | permit exception rip ( time-range *NAME* | )

( *SEQUENCE_NUM* | ) deny | permit exception rip ( rip ) ( *IP_ADDR IP_MASK* | any | host *IP_ADDR* ) ( any ) ( time-range *NAME* | )

( *SEQUENCE_NUM* | ) deny | permit exception rip ( ripng ) ( any ) ( any ) ( time-range *NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SEQUENCE_NUM | The sequence number of the filter in CoPP ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| IP_ADDR IP_MASK | The source IP[ address and its wildcard bits | IPv4 Address and Mask |

| | | |
|---|---|---|
| any | Any IP address | - |
| host IP_ADDR | The source IP address of a host | IPv4 Address |

## Command Mode

Config-cp-acl

## Default

None

## Usage

None

## Examples

The following example shows how to discard rip type of packets to the cpu.:

```
Switch# configure terminal
Switch (config)# control-plane access-list test
Switch (config-cp-acl)#deny exception rip rip any any
Switch (config-cp-acl)#
```

## Related Commands

Control-plane access-list

# 11.10.8 (deny | permit) exception ospf

## Command Purpose

Use deny command to discard ospf type of packets to the cpu.

Use permit command to let ospf type of packets to the cpu pass

## Command Syntax

( *SEQUENCE_NUM* | ) deny | permit exception ospf ( time-range *NAME* | )

( *SEQUENCE_NUM* | ) deny | permit exception ospf ( ospfv2 ) ( *IP_ADDR IP_MASK* | any | host *IP_ADDR* ) ( any ) ( time-range *NAME* | )

( *SEQUENCE_NUM* | ) deny | permit exception ospf ( ospfv3 ) ( any ) ( any ) ( time-range *NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SEQUENCE_NUM | The sequence number of the filter in CoPP ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| IP_ADDR IP_MASK | The source IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any IP address | - |
| host IP_ADDR | The source IP address of a host | IPv4 Address |
| ospfv2 | ospfv2 type message | - |
| ospfv3 | ospfv3 type message | - |

## Command Mode

Config-cp-acl

## Default

None

## Usage

None

## Examples

The following example shows how to discard ospf type of packets to the cpu.:

```
Switch# configure terminal
Switch (config)# control-plane access-list test
Switch (config-cp-acl)#deny exception ospf ospfv2 any any
Switch (config-cp-acl)#
```

## Related Commands

Control-plane access-list

# 11.10.9 (deny | permit) exception pim

## Command Purpose

Use deny command to discard pim type of packets to the cpu.

Use permit command to let pim type of packets to the cpu pass

## Command Syntax

( *SEQUENCE_NUM* | ) deny | permit exception pim ( time-range *NAME* | )

( *SEQUENCE_NUM* | ) deny | permit exception pim ( pim ) ( *IP_ADDR IP_MASK* | any | host *IP_ADDR* ) ( any ) ( time-range *NAME* | )

( *SEQUENCE_NUM* | ) deny | permit exception pim ( pimv6 ) ( any ) ( any ) ( time-range *NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SEQUENCE_NUM | The sequence number of the filter in CoPP ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| IP_ADDR IP_MASK | The source IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any IP address | - |
| host IP_ADDR | The source IP address of a host | IPv4 Address |
| pimv6 | pimv6 type message | - |

## Command Mode

Config-cp-acl

## Default

None

## Usage

None

## Examples

The following example shows how to discard pim type of packets to the cpu.:

```
Switch# configure terminal
Switch (config)# control-plane access-list test
Switch (config-cp-acl)#deny exception pim pim any any
Switch (config-cp-acl)#
```

## Related Commands

Control-plane access-list

# 11.10.10 (deny | permit) exception bgp

## Command Purpose

Use deny command to discard bgp type of packets to the cpu.

Use permit command to let bgp type of packets to the cpu pass

## Command Syntax

( *SEQUENCE_NUM* | ) deny | permit exception bgp ( time-range *NAME* | )

( *SEQUENCE_NUM* | ) deny | permit exception bgp ( bgp ) ( *IP_ADDR IP_MASK* | any | host *IP_ADDR* ) ( any ) ( time-range *NAME* | )

( *SEQUENCE_NUM* | ) deny | permit exception bgp ( bgp4plus ) ( any ) ( any ) ( time-range *NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SEQUENCE_NUM | The sequence number of the filter in CoPP ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| IP_ADDR IP_MASK | The source IP address and its wildcard bits | IPv4 Address and Mask |

| | | |
|---|---|---|
| any | Any IP address | - |
| host IP_ADDR | The source IP address of a host | IPv4 Address |
| bgp4plus | bgp4plus type message | - |

### Command Mode

Config-cp-acl

### Default

None

### Usage

None

### Examples

The following example shows how to discard bgp type of packets to the cpu.:

```
Switch# configure terminal
Switch (config)# control-plane access-list test
Switch (config-cp-acl)#deny exception bgp bgp any any
Switch (config-cp-acl)#
```

### Related Commands

Control-plane access-list

## 11.10.11 (deny | permit) exception vrrp

### Command Purpose

Use deny command to discard vrrp type of packets to the cpu.

Use permit command to let vrrp type of packets to the cpu pass

### Command Syntax

( *SEQUENCE_NUM* | ) deny | permit exception vrrp ( time-range *NAME* | )

( *SEQUENCE_NUM* | ) deny | permit exception vrrp ( vrrp ) ( *IP_ADDR IP_MASK* | any | host *IP_ADDR* ) ( any ) ( time-range *NAME* | )

( *SEQUENCE_NUM* | ) deny | permit exception vrrp ( vrrpv6 ) ( any ) ( any ) ( time-range *NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SEQUENCE_NUM | The sequence number of the filter in CoPP ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| IP_ADDR IP_MASK | The source IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any IP address | - |
| host IP_ADDR | The source IP address of a host | IPv4 Address |
| vrrpv6 | vrrpv6 type message | - |

## Command Mode

Config-cp-acl

## Default

None

## Usage

None

## Examples

The following example shows how to discard vrrp type of packets to the cpu.:

```
Switch# configure terminal
Switch (config)# control-plane access-list test
Switch (config-cp-acl)#deny exception vrrp vrrp any any
Switch (config-cp-acl)#
```

## Related Commands

Control-plane access-list

# 11.10.12 (deny | permit) exception ssh

## Command Purpose

Use deny command to discard ssh type of packets to the cpu.

Use permit command to let ssh type of packets to the cpu pass

## Command Syntax

( *SEQUENCE_NUM* | ) deny | permit exception ssh ( untag-vlan | { vlan *VLAN_ID* | cos *COS* } | ) ( time-range *NAME* | )

( *SEQUENCE_NUM* | ) deny | permit exception ssh ( untag-vlan | { vlan *VLAN_ID* | cos *COS* } | ) ( ipv4 ) ( tcp ) ( *IP_ADDR IP_MASK* | any | host *IP_ADDR* ) ( any ) ( src-port ( eq *L4_PORT* ) | ) ( time-range *NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SEQUENCE_NUM | The sequence number of the filter in CoPP ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| IP_ADDR IP_MASK | The source IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any IP address | - |
| host IP_ADDR | The source IP address of a host | IPv4 Address |

## Command Mode

Config-cp-acl

## Default

None

## Usage

None

## Examples

The following example shows how to discard ssh type of packets to the cpu.:

```
Switch# configure terminal
Switch (config)# control-plane access-list test
Switch (config-cp-acl)#deny exception ssh
Switch (config-cp-acl)#
```

## Related Commands

Control-plane access-list

# 11.10.13 (deny | permit) exception telnet

## Command Purpose

Use deny command to discard telnet type of packets to the cpu.

Use permit command to let telnet type of packets to the cpu pass

## Command Syntax

( *SEQUENCE_NUM* | ) deny | permit exception telnet ( untag-vlan | { vlan *VLAN_ID* | cos *COS* } | ) ( time-range *NAME* | )

( *SEQUENCE_NUM* | ) deny | permit exception telnet ( untag-vlan | { vlan *VLAN_ID* | cos *COS* } | ) ( ipv4 ) ( tcp ) ( *IP_ADDR IP_MASK* | any | host *IP_ADDR* ) ( any ) ( src-port ( eq *L4_PORT* ) | ) ( time-range *NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SEQUENCE_NUM | The sequence number of the filter in CoPP ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| IP_ADDR IP_MASK | The source IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any IP address | - |
| host IP_ADDR | The source IP address of a host | IPv4 Address |

## Command Mode

Config-cp-acl

## Default

None

## Usage

None

## Examples

The following example shows how to discard telnet type of packets to the cpu.:

```
Switch# configure terminal
Switch (config)# control-plane access-list test
Switch (config-cp-acl)#deny exception telnet
Switch (config-cp-acl)#
```

## Related Commands

Control-plane access-list

# 11.10.14 (deny | permit) exception tcp

## Command Purpose

Use deny command to discard tcp type of packets to the cpu.

Use permit command to let tcp type of packets to the cpu pass

## Command Syntax

( *SEQUENCE_NUM* | ) deny | permit exception tcp ( untag-vlan | { vlan *VLAN_ID* | cos *COS* } | ) ( time-range *NAME* | )

( *SEQUENCE_NUM* | ) deny | permit exception tcp ( untag-vlan | { vlan *VLAN_ID* | cos *COS* } | ) ( ipv4 ) ( tcp ) ( *IP_ADDR IP_MASK* | any | host *IP_ADDR* ) ( any ) ( src-port ( eq *L4_PORT* ) | ) ( dst-port ( eq *L4_PORT* ) | ) ( time-range *NAME* | )

( *SEQUENCE_NUM* | ) deny | permit exception tcp ( untag-vlan | { vlan *VLAN_ID* | cos *COS* } | ) ( ipv6 ) ( tcp ) ( any ) ( any ) ( src-port ( eq *L4_PORT* ) | ) ( dst-port ( eq *L4_PORT* ) | ) ( time-range *NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SEQUENCE_NUM | The sequence number of the filter in CoPP ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| IP_ADDR IP_MASK | The source IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any IP address | - |
| host IP_ADDR | The source IP address of a host | IPv4 Address |

## Command Mode

Config-cp-acl

## Default

None

## Usage

None

## Examples

The following example shows how to discard tcp type of packets to the cpu.:

```
Switch# configure terminal
Switch (config)# control-plane access-list test
Switch (config-cp-acl)#deny exception tcp
Switch (config-cp-acl)#
```

## Related Commands

Control-plane access-list

# 11.10.15 (deny | permit) exception mlag

## Command Purpose

Use deny command to discard mlag type of packets to the cpu.

Use permit command to let mlag type of packets to the cpu pass

## Command Syntax

( *SEQUENCE_NUM* | ) deny | permit exception mlag ( untag-vlan | { vlan *VLAN_ID* | cos *COS* } | ) ( time-range *NAME* | )

( *SEQUENCE_NUM* | ) deny | permit exception mlag ( untag-vlan | { vlan *VLAN_ID* | cos *COS* } | ) ( ipv4 ) ( tcp ) ( *IP_ADDR IP_MASK* | any | host *IP_ADDR* ) ( any ) ( src-port ( eq *L4_PORT* ) | ) ( time-range *NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SEQUENCE_NUM | The sequence number of the filter in CoPP ACL. An auto-generated sequence number will be assigned to the filter if this field is not presented. | 1-131071 |
| IP_ADDR IP_MASK | The source IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any IP address | - |
| host IP_ADDR | The source IP address of a host | IPv4 Address |

## Command Mode

Control plane Configuration

## Default

None

## Usage

None

## Examples

The following example shows how to discard mlag type of packets to the cpu.:

```
Switch# configure terminal
Switch (config)# control-plane access-list test
Switch (config-cp-acl)#deny exception mlag
Switch (config-cp-acl)#
```

## Related Commands

Control-plane access-list

# 11.10.16 (deny | permit) exception arp

## Command Purpose

Use deny command to discard arp type of packets to the cpu.

Use permit command to let arp type of packets to the cpu pass

## Command Syntax

( *SEQUENCE_NUM* | ) deny | permit exception arp ( untag-vlan | { vlan *VLAN_ID* | cos *COS* } | ) ( arp-op-code *ARP_OP_CODE* | ) ( sender-ip ( *IP_ADDR IP_MASK* | any | host *IP_ADDR* ) | ) ( time-range *NAME* | )

( *SEQUENCE_NUM* | ) deny | permit exception arp ( untag-vlan | { vlan *VLAN_ID* | cos *COS* } | ) ( garp ) ( time-range *NAME* | )

( *SEQUENCE_NUM* | ) deny | permit exception arp ( untag-vlan | { vlan *VLAN_ID* | cos *COS* } | ) ( arp-reply | arp-request ) ( time-range *NAME* | )

( *SEQUENCE_NUM* | ) deny | permit exception arp ( untag-vlan | { vlan *VLAN_ID* | cos *COS* } | ) ( rarp-reply | rarp-request ) ( time-range *NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IP_ADDR IP_MASK | The source IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any IP address | - |
| host IP_ADDR | The source IP address of a host | IPv4 Address |
| VLAN_ID | The range of vlan id is from 1 to 4094 | 1-4094 |

| | | |
|---|---|---|
| COS | The range of cos is from 0 to 7 | 0-7 |
| ARP_OP_CODE | The range of arp-op-code is from 0 to 65535 | 0-65535 |
| arp-request | Arp request type message | - |
| arp-reply | Arp reply type message | - |
| rarp-request | Rarp request type message | - |
| rarp-reply | Rarp reply type message | - |

## Command Mode

Config-cp-acl

## Default

None

## Usage

None

## Examples

The following example shows how to discard arp type of packets to the cpu.:

```
Switch# configure terminal
Switch (config)# control-plane access-list test
Switch (config-cp-acl)#deny exception arp arp-op-code 1 any
Switch (config-cp-acl)#
```

## Related Commands

Control-plane access-list

# 11.10.17 (deny | permit) exception igmp

## Command Purpose

Use deny command to discard igmp type of packets to the cpu.

Use permit command to let igmp type of packets to the cpu pass

## Command Syntax

( *SEQUENCE_NUM* | ) ( deny | permit ) exception igmp ( untag-vlan | { vlan *VLAN_ID* | cos *COS* } | ) ( igmp ) ( *IP_ADDR IP_MASK* | any | host *IP_ADDR* ) ( any ) ( dvmrp | host-query | host-report | mtrace | mtrace-response | pim | precedence | trace | v2-leave | v2-report | v3-report | ) ( time-range *NAME* | )

( *SEQUENCE_NUM* | ) deny | permit exception igmp ( untag-vlan | { vlan *VLAN_ID* | cos *COS* } | ) ( igmp ) ( *IP_ADDR IP_MASK* | any | host *IP_ADDR* ) ( any ) ( igmp-type *IGMP_TYPE* ) ( time-range *NAME* | )

( *SEQUENCE_NUM* | ) deny | permit exception igmp ( untag-vlan | { vlan *VLAN_ID* | cos *COS* } | ) ( mld ) ( any ) ( any ) ( mld-query | mld-report | mld-done | mldv2-report | ) ( time-range *NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IP_ADDR IP_MASK | The source IP address and its wildcard bits | IPv4 Address and Mask |
| any | Any IP address | - |
| host IP_ADDR | The source IP address of a host | IPv4 Address |
| VLAN_ID | The range of vlan id is from 1 to 4094 | 1-4094 |
| COS | The range of cos is from 0 to 7 | 0-7 |
| IGMP_TYPE | The range of icmp-type is from 0 to 255 | 0-255 |
| dvmrp | Dvmrp type message | - |
| host-query | host-query type message | - |
| host-report | host-report type message | - |
| mtrace | mtrace type message | - |
| mtrace-response | mtrace-response type message | - |
| pim | pim type message | - |
| trace | trace type message | - |
| v2-leave | v2-leave type message | - |
| v2-report | v2-report type message | - |
| v3-report | v3-report type message | - |
| mld-query | Multicast Listener Query(130) | - |
| mld-report | Multicast Listener Report(131) | - |

| | | |
|---|---|---|
| mld-done | Multicast Listener Done(132) | - |
| mldv2-report | MLDv2 Multicast Listener Report(143) | - |

## Command Mode

Config-cp-acl

## Default

None

## Usage

None

## Examples

The following example shows how to discard igmp type of packets to the cpu.:

```
Switch# configure terminal
Switch (config)# control-plane access-list test
Switch (config-cp-acl)#deny exception igmp igmp any any
Switch (config-cp-acl)#
```

## Related Commands

Control-plane access-list

# 11.10.18 (deny | permit) exception

## Command Purpose

Use deny command to discard specified type of packets to the cpu.

Use permit command to let specified type of packets to the cpu pass

## Command Syntax

( *SEQUENCE_NUM* | ) deny | permit exception ( bpdu | erps | eapol | smart-link | ldp | ptp | rsvp | icmp-redirect | mcast-rpf-fail | macsa-mismatch | vlan-security-

discard | port-security-discard | ip-option | udld | dot1x-mac-bypass | l2protocol-tunnel ) ( time-range *NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IP_ADDR IP_MASK | The source IP address and its wildcard bits | IPv4 Address and Mask |

## Command Mode

Config-cp-acl

## Default

None

## Usage

None

## Examples

The following example shows how to discard pbdu type of packets to the cpu.:

```
Switch# configure terminal
Switch (config)# control-plane access-list test
Switch (config-cp-acl)#deny exception bpdu
Switch (config-cp-acl)#
```

## Related Commands

Control-plane access-list

# 11.10.19 class-map type (control-plane)

## Command Purpose

Use this command to create a control-plane class map.

Use the no form to delete the class map.

## Command Syntax

class-map type ( control-plane ) *NAME*

no class-map *NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | Specify class map name | A string with up to 40 characters |

## Command Mode

Global Configuration

## Default

None

## Usage

None

## Examples

The following example shows how to create a control-plane class map.:

```
Switch # configure terminal
Switch (config)# class-map type control-plane test
Switch (config-cmap-cp)
```

## Related Commands

class type control-plane

# 11.10.20 match access-group

## Command Purpose

Use this command to add access group to the class map.

Use the no form of this command to unbind it.

## Command Syntax

match access-group *NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | Specify access list name | A string with up to 40 characters |

## Command Mode

Class-map Configuration

## Default

None

## Usage

None

## Examples

The following example shows how to add access group to the class map:

```
Switch# configure terminal
Switch (config)# class-map type control-plane test
Switch (config-cmap-cp)# match access-group test
```

## Related Commands

Class-map type control-plane

# 11.10.21 policy-map type (control-plane)

## Command Purpose

Use this command to create a control-plane policy map.

Use the no form to delete the policy map.

## Command Syntax

policy-map type ( control-plane ) *NAME*

no policy-map *NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | Specify policy map name | A string with up to 40 characters |

## Command Mode

Global Configuration

## Default

None

## Usage

None

## Examples

The following example shows how to create a control-plane policy map.:

```
Switch # configure terminal
Switch (config)# policy-map type control-plane test
Switch (config-pmap-cp)#
```

## Related Commands

service-policy type control-plane input

# 11.10.22 class type control-plane

## Command Purpose

Use this command to add the class map to the policy map

Use the no form of this command to unbind it.

## Command Syntax

class type control-plane ( *NAME* | class-default )

no class type control-plane ( *NAME* | class-default )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | Specify class map name | A string with up to 40 characters |

## Command Mode

Config-pmap-c Configuration

## Default

None

## Usage

None

## Examples

The following example shows how to add the class map to the policy map:

```
Switch# configure terminal
Switch (config)# policy-map type control-plane test
Switch (config-pmap-cp)# class type control-plane test
Switch (config-pmap-cp-c)#
```

## Related Commands

class-map type (control-plane)

# 11.10.23 statistics enable

## Command Purpose

Use this command to enable statistics.

Use the no form to disable it.

### Command Syntax

statistics enable

no statistics enable

### Command Mode

Global Configuration

### Default

None

### Usage

None

### Examples

The following example shows how to enable statistics.:

```
Switch# configure terminal
Switch (config)# policy-map type control-plane test
Switch (config-pmap-cp)# class type control-plane test
Switch (config-pmap-cp-c)# statistics enable
```

### Related Commands

class-map type (control-plane)

## 11.10.24 control-plane

### Command Purpose

Use this command to enter global control plane mode.

### Command Syntax

control-plane

### Command Mode

Global Configuration

### Default

None

### Usage

None

### Examples

The following example shows how to enter global control plane mode:

```
Switch# configure terminal
Switch (config)# control-plane
Switch (Config-control-plain)#
```

### Related Commands

service-policy type control-plane input

## 11.10.25 service-policy type control-plane input

### Command Purpose

Use this command to apply the flow policy to Control plane

Use the 'no' command to delete the flow policy applied to the Control plane

### Command Syntax

service-policy type control-plane input *NAME*

no service-policy type control-plane input

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | Name of flow policy | A string with up to 40 characters |

## Command Mode

Control plane Configuration

Interface Configuration

## Default

none

## Usage

none

## Examples

Here is an example of how to use this command to apply flow strategy

```
Switch# configure terminal
Switch (Config-control-plain)# service-policy type control-plane input test
Switch (Config-control-plain)#
Switch# configure terminal
Switch(config)# interface eth-0-2
Switch(config-if)# service-policy type control-plane input p1
```

## Related Commands

policy-map type control-plane

# 11.10.26 show policy-map type control-plane statistics input ace

## Command Purpose

Use this command to show stats of copp policer

## Command Syntax

show policy-map type control-plane statistics input ace ( class-based | ace-based ) ( class *NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | Specify class map name | A string with up to 40 characters |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following example shows how to show stats of copp policer:

```
Switch # show policy-map type control-plane statistics input policer
```

## Related Commands

clear policy-map type control-plane statistics input

# 11.10.27 policer cir

## Command Purpose

To Specify a policer for the classified traffic, config CIR CBS and enable policer statistics

## Command Syntax

policer cir *CIR* ( cbs *CBS* | ) ( statistics | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| CIR | CIR Commit Information Rate (pps) | 0-148809523 |
| CBS | CBS - Commit Burst Size (packets) (default value is 4400)", | 0-7600 |
| statistics | enable policer stat | - |

## Command Mode

Config-pmap-c Configuration

## Default

Policer cir is not configured by default

If CBS is not specified, the default value is 4400

## Usage

limit the rate of some exception traffic to cpu

## Examples

config the traffic rate of ARP exception and enable policer stat:

```
Switch# configure terminal
Switch(config)#control-plane access-list testacl
Switch(config-cp-acl)#10 permit exception arp
Switch(config-cp-acl)#class-map type control-plane testclass
Switch(config-cmap-cp)#match access-group testacl
Switch(config-cmap-cp)#policy-map type control-plane testpolicy
Switch(config-pmap-cp)#class type control-plane testclass
Switch(config-pmap-cp-c)#policer cir 100 statistics
Switch(config-pmap-cp-c)#control-plane
Switch(Config-control-plain)service-policy type control-plane input testpolicy
```

## Related Commands

show policy-map type control-plane statistics input

# 11.10.28 show policy-map type control-plane statistics input policer

## Command Purpose

To show statistics of any policy, class name can be specified

## Command Syntax

show policy-map type control-plane statistics input policer ( class *NAME* | )

clear policy-map type control-plane statistics input policer

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | Specify class map name | A string with up to 40 characters |

## Command Mode

Global Configuration

## Default

None

## Usage

To show statistics of any policy, class name can be specified

## Examples

To show statistics of any policy, class name can be specified:

```
Switch#show policy-map type control-plane statistics input policer
```

## Related Commands

policer cir

# 11.11 IEEE 802.1x Commands

## 11.11.1 dot1x system-auth-ctrl

### Command Purpose

Use the dot1x system-auth-ctrl to globally start the dot1x authenticate control feature.

To remove this configure, use no form of this command.

### Command Syntax

dot1x system-auth-ctrl

no dot1x system-auth-ctrl

### Command Mode

Global Configuration

### Default

Disable

### Usage

Use this command to globally start the dot1x feature. To make the dot1x configures on each port work normally, this command should be used.

### Examples

The following is sample output from the dot1x system-auth-ctrl command:

```
Switch# configure terminal
Switch(config)# dot1x system-auth-ctrl
Switch(config)# no dot1x system-auth-ctrl
```

### Related Commands

show dot1x

dot1x port-control

## 11.11.2 dot1x initialize

### Command Purpose

Use the dot1x initialize privileged EXEC command on the switch to manually return the specified IEEE 802.1x-enabled port to an unauthorized state before initiating a new authentication session on the port.

### Command Syntax

dot1x initialize interface *IFNAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | Specify the interface name to be initialized | This function supports routed port and access port, and Does not Support trunk port |

### Command Mode

Privileged EXEC

### Default

None

### Usage

Use this command to initialize the IEEE 802.1x state machines and to set up a fresh environment for authentication. After you enter this command, the port status becomes unauthorized.

### Examples

The following is sample output from the dot1x initialize command:

```
Switch# dot1x initialize interface eth-0-1
```

## Related Commands

show dot1x

# 11.11.3 dot1x max-req

## Command Purpose

Use the dot1x max-reauth-req interface configuration command on the switch to set the maximum number of times that the switch restarts the authentication process before a port changes to the unauthorized state. Use the no form of this command to return to the default setting.

## Command Syntax

dot1x max-req *COUNT*

no dot1x max-req

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| COUNT | Number of times that the switch restarts the authentication process before the port changes to the unauthorized state. | 1-10 |

## Command Mode

Interface Configuration

## Default

The default value of dot1x max-reauth-req is 2 times.

## Usage

You should change the default value of this command only to adjust for unusual circumstances such as unreliable links or specific behavioral problems with certain clients and authentication servers.

## Examples

The following is sample output from the dot1x max-reauth-req command:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# dot1x max-req 4
```

## Related Commands

show dot1x

# 11.11.4 dot1x port-control

## Command Purpose

Use the dot1x port-control interface configuration command on the switch to enable manual control of the authorization state of the port. Use the no form of this command to return to the default setting.

Support config dot1x in routed port, while can't config it in a logical port such as agg, and so on.

## Command Syntax

dot1x port-control ( auto | force-authorized | force-unauthorized | dir ( both | in ) )

no dot1x port-control

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| auto | Enable IEEE 802.1x authentication on the port and cause the port to change to the authorized or unauthorized state based on the IEEE 802.1x authentication exchange between the switch and the client | - |

| | | |
|---|---|---|
| force-authorized | Disable IEEE 802.1x authentication on the port and cause the port to transition to the authorized state without an authentication exchange. The port sends and receives normal traffic without IEEE 802.1x-based authentication of the client | - |
| force-unauthorized | Deny all access through this port by forcing the port to change to the unauthorized state, ignoring all attempts by the client to authenticate. The switch cannot provide authentication services to the client through the port | - |
| dir | Specify the dot1x control direction | - |
| both | Discard received and transmitted packets | - |
| in | Discard received packets only | - |

## Command Mode

Interface Configuration

## Default

Dot1x port control is disabled by default.

The default value of the control direction is “in”.

## Usage

You must globally enable IEEE 802.1x authentication on the switch by using the dot1x system-auth-control global configuration command before enabling IEEE 802.1x authentication on a specific port.

### Examples

The following is sample output from the dot1x port-control command:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# dot1x port-control auto
```

### Related Commands

show dot1x

## 11.11.5 dot1x protocol-version

### Command Purpose

Use the dot1x protocol-version interface configuration command on the switch to set the version of EAPOL packets. Use the no form of this command to return to the default setting.

### Command Syntax

dot1x protocol-version *VER*

no dot1x protocol-version

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VER | The EAPOL version | 1-2 |

### Command Mode

Interface Configuration

### Default

The default value of EAPOL version is 2.

### Usage

You must specify the control of the authorization state of the port by the dot1x port-control command, before setting the EAPOL version.

## Examples

The following is sample output from the dot1x protocol-version command:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# dot1x protocol-version 1
```

## Related Commands

show dot1x

# 11.11.6 dot1x timeout quiet-period

## Command Purpose

Use the dot1x timeout quiet-period interface configuration command on the switch to set the quiet time interval. Use the no form of this command to return to the default setting.

## Command Syntax

dot1x timeout quiet-period *SECONDS*

no dot1x timeout quiet-period

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SECONDS | The time interval (in seconds) between the retrials of authentication | 1-65535 seconds |

## Command Mode

Interface Configuration

## Default

The default value of dot1x quite-period is 60 seconds.

### Usage

During the quiet period, the switch does not accept or initiate any authentication requests. If you want to provide a faster response time to the user, enter a number smaller than the default.

### Examples

The following is sample output from the dot1x quiet-period command:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# dot1x timeout quiet-period 100
```

### Related Commands

show dot1x

## 11.11.7 dot1x handshake

### Command Purpose

Use the dot1x handshake interface configuration command on the switch to enable periodic handshake of the client. Use the no form of this command to return to the default setting.

### Command Syntax

dot1x handshake

no dot1x handshake

### Command Mode

Interface Configuration

### Default

None

## Usage

The default setting of dot1x handshake is disabled. when the hanshake is disabled, the configuration of the handshake timeout should not take effect.

## Examples

The following is sample output from the dot1x handshake command:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# dot1x handshake
```

## Related Commands

dot1x timeout

dot1x max-req

# 11.11.8 dot1x timeout handshake-period

## Command Purpose

Use the dot1x timeout handshake-period interface configuration command on the switch to set the handshake time interval. Use the no form of this command to return to the default setting.

## Command Syntax

dot1x timeout handshake-period *SECONDS*

no dot1x timeout handshake-period

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SECONDS | The time interval (in seconds) between the retrials of handshake for online uses | 5-7200 seconds |

## Command Mode

Interface Configuration

### Default

The default value of dot1x handshake-period is 60 seconds.

### Usage

If handshake period was changed when handshake was already enabled, it will take into effect immediately for online users.

### Examples

The following is sample output from the dot1x handshake-period command:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# dot1x timeout handshake-period 100
```

### Related Commands

dot1x handshake

dot1x max-req

## 11.11.9 dot1x reauthentication

### Command Purpose

Use the dot1x reauthentication interface configuration command on the switch to enable periodic re-authentication of the client. Use the no form of this command to return to the default setting.

### Command Syntax

dot1x reauthentication

no dot1x reauthentication

### Command Mode

Interface Configuration

## Default

None

## Usage

The default setting of dot1x re-authentication is disabled. when the re-authentication is disabled, the configuration of the re-authenticate timeout should not take effect.

## Examples

The following is sample output from the dot1x reauthentication command:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# dot1x reauthentication
```

## Related Commands

show dot1x

dot1x timeout

# 11.11.10 dot1x re-authenticate

## Command Purpose

Use the dot1x re-authenticate privileged EXEC command on the switch stack to manually initiate a re-authentication of the specified IEEE 802.1x-enabled port.

## Command Syntax

dot1x re-authenticate interface *IFNAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | The interface to re-authenticate | This function supports routed port and access port, and Does not Support trunk port |

## Command Mode

Privileged EXEC

## Default

None

## Usage

You can use this command to re-authenticate a client without waiting for the configured number of seconds between re-authentication attempts (re-authperiod) and automatic re-authentication.

## Examples

The following is sample output from the dot1x re-authenticate command:

```
Switch# dot1x re-authenticate interface eth-0-1
```

## Related Commands

show dot1x

# 11.11.11 dot1x timeout

## Command Purpose

Use the dot1x timeout interface configuration command on the switch stack or on a standalone switch to set IEEE 802.1x timers. Use the no form of this command to return to the default setting.

## Command Syntax

dot1x timeout ( re-authperiod *SECONDS* | server-timeout *SECONDS* | supp-timeout *SECONDS* | tx-period *SECONDS* )

no dot1x timeout ( reauth-period | server-timeout | supp-timeout | tx-period )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| re-authperiod SECONDS | Set the number of seconds between reauthentication attempts. | 60-65535 seconds |
| server-timeout SECONDS | Number of seconds that the switch waits for the retransmission of packets by the switch to the authentication server. | 1-65535 seconds |
| supp-timeout SECONDS | Number of seconds that the switch waits for the retransmission of packets by the switch to the IEEE 802.1x client. | 1-65535 seconds |
| tx-period SECONDS | Number of seconds that the switch waits for a response to an EAP-request/identity frame from the client before retransmitting the request. | 1-65535 seconds |

## Command Mode

Interface Configuration

## Default

None

## Usage

You should change the default value of this command only to adjust for unusual circumstances such as unreliable links or specific behavioral problems with certain clients and authentication servers.

The dot1x timeout re-authperiod interface configuration command affects the behavior of the switch only if you have enabled periodic re-authentication by using the dot1x reauthentication interface configuration command.

The default value of re-authperiod is 3600 seconds.

The default value of tx-period is 30 seconds.

The default value of supp-timeout is 30 seconds.

The default value of server-timeout is 30 seconds.

## Examples

The following is sample output from the dot1x timeout command:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# dot1x reauthentication
Switch(config-if)# dot1x timeout reauth-period 4000
```

## Related Commands

dot1x reauthentication

show dot1x

# 11.11.12 dot1x guest-vlan

## Command Purpose

Use the dot1x guest-vlan interface configuration command to specify an active VLAN as an 802.1x guest VLAN. Use the no form of this command to return to the default setting.

## Command Syntax

dot1x guest-vlan *VLAN_ID*

no dot1x guest-vlan

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Specify an active VLAN as an 802.1x guest VLAN. | 2-4094 |

## Command Mode

Interface Configuration

## Default

No guest VLAN is configured.

## Usage

When you configure a guest VLAN, clients that are not 802.1x-capable are put into the guest VLAN when the server does not receive a response to its Extensible Authentication Protocol over LAN (EAPOL) request/identity frame. Clients that are 802.1x-capable but fail authentication are not granted access to the network.

The guest VLAN feature is not supported on internal VLANs (routed ports) or trunk ports; it is supported only on access ports

## Examples

This example shows how to specify VLAN 5 as an 802.1x guest VLAN:

```
Switch# configure terminal
Switch(config)#vlan database
Switch(config-vlan)#vlan 5
Switch(config-vlan)#exit
Switch(config)# interface eth-0-1
Switch(config-if)#switchport mode access
Switch(config-if)#dot1x port-control auto
Switch(config-if)#dot1x guest-vlan 5
```

## Related Commands

show dot1x

# 11.11.13 dot1x auth-fail-vlan

## Command Purpose

Use this command to configure the auth-fail-vlan that the authentication failed user joined on the authentication interface.

Use the 'no' format to delete the configuration.

## Command Syntax

dot1x auth-fail-vlan *VLAN_ID*

no dot1x auth-fail-vlan

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| VLAN_ID | Specify an existing VLAN as the dot1x auth-fail-vlan | 2-4094 |

## Command Mode

interface Configuration

## Default

None

## Usage

Use this command to configure auth-fail-vlan on the interface that enables dot1x authentication. If the client authentication fails, it will be temporarily assigned to this valn and can communicate within the vlan. When the quiet period timer expires, the user will be assigned to Guest VLAN. The VLAN must be a VLAN that has already been created.

## Examples

Configure auth fail vla 50 for the interface

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# dot1x port-control auto
Switch(config-if)# dot1x auth-fail-vlan 50
```

## Related Commands

dot1x port-control auto

dot1x timeout quiet-period

# 11.11.14 dot1x critical-vlan

## Command Purpose

Use this command to configure the critical-vlan on the dot1x interface. When the authentication server is unreachable, newly connected users will be added to this vlan.

Use the 'no' format to delete the configuration.

## Command Syntax

dot1x critical-vlan *VLAN_ID*

no dot1x critical-vlan

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Specify an existing VLAN as the dot1x critical vlan. | 2-4094 |

## Command Mode

interface Configuration

## Default

None

## Usage

Use this command to configure critical-vlan for the interface that enables dot1x authentication. When the client authentication cannot be completed due to server unreachable, the client will be temporarily assigned to this valn. When the quiet period timer expires, the user will be assigned to Guest VLAN. The critical-vlan configured must be a VLAN that has already been created.

### Examples

To configure Critical-VLAN 100 for the dot1x interface, if authentication cannot be performed due to unreachable authentication servers, the client will be temporarily assigned to that VLAN

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# dot1x port-control auto
Switch(config-if)# dot1x critical-vlan 100
```

### Related Commands

dot1x port-control auto

dot1x timeout quiet-period

## 11.11.15 debug dot1x

### Command Purpose

Use this command to turn on the debug switches of dot1x module.

To restore the default, use the no form of this command

### Command Syntax

debug dot1x ( event | timer | packet | all )

no debug dot1x ( event | timer | packet | all )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| event | put out the debug message of dot1x events | - |
| timer | put out the debug message of dot1x timer information | - |
| packet | put out the debug message of dot1x packets information, include sent and received | - |
| all | put out all debug message mentioned above | - |

### Command Mode

Privileged EXEC

### Default

None

### Usage

Use command “terminal monitor” to make debug messages print on the VTY immediately.

Use command “show logging buffer” to check the debug messages in the logging buffer.

### Examples

The following is sample to open dot1x debug switches:

```
Switch# debug dot1x all
```

### Related Commands

terminal monitor

show logging buffer

## 11.11.16 clear dot1x statistics

### Command Purpose

Use the clear dot1x user EXEC command to clear the IEEE 802.1x statistics for the switch or for the specified port.

### Command Syntax

clear dot1x statistics ( all | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| all | Display IEEE 802.1x information of all interfaces | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

Use the command “clear dot1x” to clear the IEEE 802.1x statistics for the switch or for the specified port.

Use the command “show dot1x” to display the IEEE 802.1x statistics.

## Examples

The following is sample to using the clear dot1x command:

```
Switch# clear dot1x statistics
Switch# clear dot1x session-statistics
```

## Related Commands

dot1x system-auth-ctrl

dot1x port-control

show dot1x

# 11.11.17 dot1x port-mode

## Command Purpose

Use the “dot1x port-mode” command to set control mode of the interface.

Use the no form of this command to restore the default value.

## Command Syntax

dot1x port-mode ( port | mac )

no dot1x port-mode

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| port | Set dot1x port based | - |
| mac | Set dot1x mac based | - |

## Command Mode

Interface Configuration

## Default

By default the mode is port based.

## Usage

Use the “dot1x port-mode” command to set control mode of the interface.

Use the no form of this command to restore the default value.

dot1x port-control must be enabled before set the control mode.

The control mode cannot be changed if there are users on line.

## Examples

The following is a sample to use the dot1x port-mode command:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# dot1x port-mode mac
```

## Related Commands

dot1x port-control

# 11.11.18 dot1x max-user

## Command Purpose

Use the “dot1x max-user” command to set max user of the interface.

Use the no form of this command to restore the default value.

## Command Syntax

dot1x max-user *COUNT*

no dot1x max-user

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| COUNT | Max user number of the port | 1-255 |

## Command Mode

Interface Configuration

## Default

By default the user number is uncontrolled on port. The max number is according to the system hardware profile.

## Usage

Use the “dot1x max-user” command to set max user of the interface.

Use the no form of this command to restore the default value.

dot1x port-control must be enabled before set the max value.

If there are users online, the set value should be larger than or at least be same as the users count.

The set value cannot be larger than the hardware resource count.

This count should limit the number of dot1x mac based user in state “accept” , “reject” and “reauth”, which should use hardware table for forwarding or

discarding. The total number of users include “waiting” states should be 2 times as this configuration.

## Examples

The following is a sample to use the dot1x max-user command:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# dot1x max-user 10
```

## Related Commands

dot1x port-control

# 11.11.19 dot1x re-active radius-server

## Command Purpose

Use the “dot1x re-active” command to active the specified radius servers.

## Command Syntax

dot1x re-active radius-server ( host *HOST_IP_ADDR* ( auth-port *PORT* | ) | interface *IFNAME* | all )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| host HOST_IP_ADDR | Re-active the radius-server by server ip | IPv4 Address |
| PORT | Re-active the radius-server by server ip and udp port. If the auth port is not specified the default port is 1812. | 1-65535 |
| IFNAME | Re-active the radius-servers by IEEE 802.1x client’s interface | This function supports routed port and access port, and Does not Support trunk port |
| all | Re-active all radius-servers | - |

## Command Mode

Privileged EXEC

### Default

None

### Usage

Use this command to active the radius server. Users do not need the wait for the radius-server dead time with this command.

### Examples

The following is samples to use the dot1x re-active radius-server command:

```
Switch# dot1x re-activate radius-server
Switch# dot1x re-activate radius-server host 3.3.3.3 auth-port 1812
Switch# dot1x re-activate radius-server interface eth-0-9
```

### Related Commands

radius-server host

radius-server deadtime

show radius-server

## 11.11.20 dot1x accounting-mode radius

### Command Purpose

Use the dot1x accounting-mode radius to globally start the dot1x accounting feature.

To remove this configure, use no form of this command.

### Command Syntax

dot1x accounting-mode radius

no dot1x accounting-mode

### Command Mode

Global Configuration

## Default

Disable

## Usage

Use this command to globally start the dot1x accounting feature. This command does not take effect immediately for users who are already online.

## Examples

The following is a sample to use the dot1x accounting-mode radius command:

```
Switch# configure terminal
Switch(config)# dot1x accounting-mode radius
Switch(config)# no dot1x accounting-mode
```

## Related Commands

None

# 11.11.21 dot1x accounting start-fail

## Command Purpose

Use the dot1x accounting start-fail to globally configure the policy when start accounting fail.

To restore the default, use no form of this command.

## Command Syntax

dot1x accounting start-fail ( offline | online )

no dot1x accounting start-fail

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| offline | Confiure start-fail policy: reject user to be online after start fail. | - |
| online | Confiure start-fail policy: accept user to be online after start fail. | - |

## Command Mode

Global Configuration

## Default

offline

## Usage

Device sends accounting start packet to accounting server after user is online, start-fail policy will be performed when received no response from accoungting server. This command does not take effect immediately for users who are already online.

## Examples

The following is a sample to use the dot1x accounting start-fail command:

```
Switch# configure terminal
Switch(config)# dot1x accounting start-fail online
Switch(config)# no dot1x start-fail
```

## Related Commands

dot1x accounting-mode radius

# 11.11.22 dot1x accounting realtime

## Command Purpose

Use the dot1x accounting realtime to globally start the dot1x realtime accounting feature and set realtime accounting interval.

To remove this configure, use no form of this command.

## Command Syntax

dot1x accounting realtime *INTERVAL*

no dot1x accounting realtime

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| INTERVAL | To set interval for sending realtime accounting packet | 1-65535 minute |

## Command Mode

Global Configuration

## Default

The default interval of dot1x realtime accounting is not configuerd, which means realtime is disabled.

## Usage

Use this command to globally start the dot1x realtime accounting feature or modify realtime accounting interval. This command does not take effect immediately for users who are already online.

## Examples

The following is a sample to use the dot1x accounting realtime radius command:

```
Switch# configure terminal
Switch(config)# dot1x accounting realtime 1
Switch(config)# no dot1x accounting realtime
```

## Related Commands

dot1x accounting-mode radius

# 11.11.23 dot1x accounting interim-fail

## Command Purpose

Use the dot1x accounting interim-fail to globally configure max accepted periods of no response for the dot1x realtime accounting request, and set policy for realtime accounting fail.

To restore the default, use no form of this command.

## Command Syntax

dot1x accounting interim-fail ( max-times *TIMES* | ) ( offline | online )

no dot1x accounting interim-fail

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| TIMES | Configure accepted max times for no response for accounting realtime request | 1-255 |
| offline | Confiure interim-fail policy: reject user to be online after interim fail. | - |
| online | Confiure interim-fail policy: accept user to be online after interim fail. | - |

## Command Mode

Global Configuration

## Default

The default policy is max-times 3 online for interim-fail

## Usage

Only continuous interim-fails will be counted. This command does not take effect immediately for users who are already online.

## Examples

The following is a sample to use the dot1x accounting interim-fail command:

```
Switch# configure terminal
Switch(config)# dot1x accounting interim-fail max-times 2 offline
Switch(config)# no dot1x accounting interim-fail
```

## Related Commands

dot1x accounting-mode radius

dot1x accounting realtime

# 11.11.24 dot1x mac-auth-bypass

## Command Purpose

Use the "dot1x mac-auth-bypass" command to enable mac-auth-bypass on the interface.

Use the no form of this command to restore the default value.

## Command Syntax

dot1x mac-auth-bypass

no dot1x mac-auth-bypass

## Command Mode

Interface Configuration

## Default

Disable

## Usage

You must specify the control of the authorization state of the port by the dot1x port-control command, before enable mac-auth-bypass.

## Examples

The following is a sample to use dot1x mac-auth-bypass command:

```
Switch# configure terminal

Switch(config)# interface eth-0-1
Switch(config-if)# dot1x mac-auth-bypass
```

## Related Commands

show dot1x

dot1x port-control

# 11.11.25 dot1x mac-auth-bypass username fixed

## Command Purpose

Use the "dot1x mac-auth-bypass username fixed" command to set fixed username for mac-auth-bypass request.

Use the no form of this command to restore the default value.

## Command Syntax

dot1x mac-auth-bypass username fixed *WORD* password ( 8 | ) *STRING*

no dot1x mac-auth-bypass username fixed

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| WORD | Specify fixed username for mac-auth-bypass users | the first character should be a-z or A-Z， can only include 0-9A-Za-z.-_ and the max len is 63 |
| 8 | Specify fixed hidden password for mac-auth-bypass users | - |
| STRING | Specify fixed password for mac-auth-bypass users | String with up to 127 characters when 8 is specified, or it is up to 63 characters |

## Command Mode

Global Configuration

## Default

By default, username for mac-auth-bypass user is set as mac address.

## Usage

Use fixed username and password for mac-auth-bypass user.

## Examples

The following is a sample to use dot1x mac-auth-bypass username fixed command

```
Switch# configure terminal

Switch(config)# dot1x mac-auth-bypass username fixed username admin password
admin123
```

## Related Commands

dot1x mac-auth-bypass username mac-address format

# 11.11.26 dot1x mac-auth-bypass username mac-address format

## Command Purpose

Use the "dot1x mac-auth-bypass username mac-address format" command to set mac address as username for mac-auth-bypass user , and the format of mac address is specified.

Use the no form of this command to restore the default value.

## Command Syntax

dot1x mac-auth-bypass username mac-address format ( with-separator-hyphen | without-separator ) ( password ( 8 | ) *Word* |same-as-uername )

no dot1x mac-auth-bypass username mac-address format

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| with-separator | Use colon ":" delimiter to separate groups. | - |
| without-separator | Indicates that the user name does not contain delimiter | - |
| password (8\|) STRING | Specify fixed hidden password or plain text password for mac-auth-bypass users | String with up to 127 characters when 8 is specified, or it is up to 63 characters |
| same-as-uername | The password is the same as the username. | |

## Command Mode

Global Configuration

## Default

By default, username for mac-auth-bypass user is set as mac address without separator and with lowercase hex digits.

## Usage

Use mac address with specified format as username for mac-auth-bypass users.

## Examples

The following is a sample to use dot1x mac-auth-bypass username mac-address format command

```
Switch# configure terminal

Switch(config)# dot1x mac-auth-bypass username mac-address format with-separator-
hyphen password same-as-username
```

## Related Commands

dot1x mac-auth-bypass username fixed

# 11.11.27 device-sensor lldp tlv

## Command Purpose

Use this command to enable LLDP device-sensor and select the reported tlv information.

Use the 'no' format to delete the configuration.

## Command Syntax

device-sensor lldp tlv [ all | chassis-id | management-address | port-description | port-id | system-capabilities | system-description | system-name | time-to-live ]

no device-sensor lldp tlv [ all | chassis-id | management-address | port-description | port-id | system-capabilities | system-description | system-name | time-to-live ]

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| all | All supported types。 | - |

| | | |
|---|---|---|
| chassis-id (Type = 1) | The ID of the device that sent the LLDP message. Generally, it is the MAC address of the device. | - |
| Port ID (Type = 2) | The name of the port that sends LLDPDU. | - |
| Time To Live(Type = 3) | LLDP's survival time in neighbors. | - |
| Port Description(Type = 4) | Description information of the local device port. | - |
| System Name(Type = 5) | The complete domain name of the local device. | - |
| System Description (Type = 6) | The full name of the local device, version number of the system , hardware type, operating system, network software, etc. | - |
| System Capabilities (Type = 7) | The supported functions of the device and the enabled functions. | - |
| Management Address(Type = 8) | Manage the address, along with the corresponding interface number and OID. | - |

## Command Mode

Global Configuration

## Default

Disable

## Usage

Enable this feature and specify the uploaded information. After the client on the port is authenticated, the switch will select the corresponding information from the LLDP information collected on the port and upload it to the server through a radius accounting packets.

## Example

Enable device-sensor, upload information including device ID, port ID, and system description of the connected device:

```
Switch# configure terminal
Switch(config)#
Switch(config)# device-sensor lldp tlv chassis-id port-id system-description
```

### Related Commands

device-sensor lldp enable

## 11.11.28 device-sensor lldp

### Command Purpose

Use this command to enable/disable the device-sensor function on the interface.When in the enabled state, the interface will send the LLDP information of authenticated clients to the Radius server based on the globally configured TLV.

### Command Syntax

device-sensor lldp [ enable | disable ]

### Command Mode

interface Configuration

### Default

Disable

### Usage

After enabling this function on the interface, when the 802.1X client on the interface has be authenticated, the switch will upload the specified part of the LLDP neighbor information collected by the interface to the server through a radius accounting message.

### Example

Enable the device-sensor on the interface, upload information including device ID, port ID, and system description of the connected device to the Radius Server:

```
Switch# configure terminal
Switch(config)#
Switch(config)# device-sensor lldp tlv chassis-id port-id system-description
Switch(config-if)# device-sensor lldp enable
```

### Related Commands

device-sensor lldp tlv

## 11.11.29 radius-server host manual-detect

### Command Purpose

Use this command to trigger the switch to perform reachability detection for RADIUS Server.

### Command Syntax

radius-server host manual-detect interface *IFNAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | An interface with dot1x enabled | |

### Command Mode

Privileged EXEC

### Default

None

### Usage

Use this command to trigger reachability detection for the Radius Server. The switch will send an authentication request packet to the server, and determine whether the server is reachable based on whether a reply message has been received. Each detection will be sent multiple times at certain intervals (the interval time and frequency are limited by radius-server retransmit and radius-server timeout), with a default of 3 times and an interval of 5 seconds.

## Example

Trigger a RADAUS Server reachability check:

```
Switch(config)# radius-server host manual-detect interface eth-0-22
```

## Related Commands

radius-server retransmit

radius-server timeout

# 11.11.30 clear dot1x mac-auth-bypass interface

## Command Purpose

Use the dot1x clear mac-auth-bypass EXEC command to clear the MAB sessions for for the specified port or mac.

## Command Syntax

clear dot1x mac-auth-bypass interface *IFPHYSICAL* ( mac *MACADDR* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| interface IFPHYSICAL | Specify an interface | - |
| mac MACADDR | Specify a mac address in HHHH.HHHH.HHHH format | MAC Address in HHHH.HHHH.HHHH format |

## Command Mode

Privileged EXEC

## Default

None

## Usage

Use this command to clear mac-auth-bypass users in all state.

## Examples

The following is a sample to use clear dot1x session mac-auth-bypass command:

```
Switch# clear dot1x mac-auth-bypass interface eth-0-1
```

## Related Commands

None

# 11.11.31 show dot1x

## Command Purpose

Use the show dot1x user EXEC command to display IEEE 802.1x session configuration, administrative status, and operational status for the switch or for the specified port.

## Command Syntax

show dot1x interface *IFNAME*

show dot1x session brief ( ( interface *IFPHYSICAL* ( mac *MACADDR* | ) ) | )

show dot1x ( all | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | Specify an interface | Support physical ports |
| MACADDR | Specify mac address | MAC Address in HHHH.HHHH.HHHH format |
| all | Display IEEE 802.1x information of all interfaces | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

N/A

## Examples

The following is sample output from the show dot1x command:

```
Switch# show dot1x all
DUT1# show dot1x all
802.1X Port-Based Authentication Enabled
=======================================
802.1X info for interface eth-0-2
  portEnabled             : false
  portControl             : Auto
  portMode                : Port based
  portStatus              : Unauthorized
  Mac Auth bypass         : disabled
  reAuthenticate          : enabled
  reAuthPeriod            : 3600
  Max user number         : 255
  Current session number  : 0
  Accept user number      : 0
  Reject user number      : 0
  Guest VLAN              : N/A
  Assign VLAN             : N/A
  QuietPeriod             : 60
  ReqMax                  : 2
  TxPeriod                : 30
  SuppTimeout             : 30
  ServerTimeout           : 30
  CD: adminControlledDirections : in
  CD: operControlledDirections  : in
  CD: bridgeDetected            : false
=======================================
```

## Related Commands

dot1x system-auth-ctrl

dot1x port-control

# 11.11.32 show dot1x mac-auth-bypass

## Command Purpose

Use the show dot1x user EXEC command to display MAC Radius users (including authenticated and unauthenticated customers) for the switch or for the specified port.

## Command Syntax

show dot1x mac-auth-bypass ( interface *IFNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | Specify an interface | Support physical ports |

## Command Mode

Privileged EXEC

## Default

None

## Usage

N/A

## Examples

The following is sample output from the show dot1x mac-auth-bypass command:

```
Switch# show dot1x mac-auth-bypass
System user count (include waiting entries): 0/512
------------------------------------------------------------------------------
interface  mac address    state    bypass   timer  in guest vlan
------------------------------------------------------------------------------
Switch#
```

## Related Commands

dot1x mac-auth-bypass

# 11.11.33 show dot1x statistics

## Command Purpose

Use the show dot1x user EXEC command to display IEEE 802.1x EAPOL packets statistics,for the switch or for the specified port.

## Command Syntax

show dot1x statistics interface *IFNAME*

show dot1x statistics ( all | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | Specify an interface | Support physical ports |
| all | Display IEEE 802.1x information of all interfaces | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

N/A

## Examples

The following is sample output from the show dot1x command:

```
Switch# show dot1x statistics interface eth-0-1
802.1X statistics for interface eth-0-1
  EAPOL Frames Rx: 0 - EAPOL Frames Tx: 323
  EAPOL Start Frames Rx: 0 - EAPOL Logoff Frames Rx: 0
  EAP Rsp/Id Frames Rx: 0 - EAP Response Frames Rx: 0
  EAP Req/Id Frames Tx: 241 - EAP Request Frames Tx: 0
  Invalid EAPOL Frames Rx: 0 - EAP Length Error Frames Rx: 0
  EAPOL Last Frame Version Rx: 0 - EAPOL Last Frame Src: 0000.0000.0000
```

### Related Commands

dot1x system-auth-ctrl

dot1x port-control

## 11.11.34 show dot1x device-sensor

### Command Purpose

Use this command to display device sensor information for all interfaces.

### Command Syntax

show dot1x device-sensor

### Command Mode

Privileged EXEC

### Default

None

### Usage

Display device-sensor information for each interface. Executing this command can display the global status of the device-sensor, the interface that enables this feature, and the device information already collected on the interface.

### Example

Display device-sensor functionality status and collected information:

```
Switch# show dot1x device-sensor
Device-Sensor is enabled(flag = 0x142)

Interface eth-0-22 device-sensor info:
  Chassid ID:          f4:a4:d6:25:d4:b0
  System Description:  Huawei AirEngine8760-X1-PRO
Huawei Versatile Routing Platform Software
VRP(R) software, Version 5.170 (AirEngine8760-X1-PRO V200R020C00SPC300)
Copyright (C) 2011-2021 Huawei Technologies Co., Ltd
```

```
 Management Address:  192.168.1.1

Switch#
```

### Related Commands

device-sensor lldp tlv

device-sensor lldp enable

## 11.11.35 show lldp device-sensor

### Command Purpose

Use this command to display the tlv information selected by LLDP and the port that enables device-sensor.

### Command Syntax

show lldp device-sensor

### Command Mode

Privileged EXEC

### Default

None

### Usage

Use this command to display the selected LLDP tlv information and the interface（s）where device-sensor functionality is enabled.

### Example

Display the LLDP tlv information selected for upload and the interface to enable this feature:

```
Switch# show lldp device-sensor
The following LLDP tlv has enabled the device sensor:
  chassis-id
  system-description
  management-address

The following interfaces has enabled the device sensor:
  eth-0-22

Switch#
```

### Related Commands

device-sensor lldp tlv

device-sensor lldp enable

## 11.12 Arp Inspection Commands

### 11.12.1 show ip arp inspection

#### Command Purpose

Use this command to display the configuration of arp inspection.

#### Command Syntax

show ip arp inspection

#### Command Mode

Privileged EXEC

#### Default

None

#### Usage

This command is used to show the general configuration of arp inspection.

## Examples

This example shows how to display the information of arp inspection:

```
Switch# show ip arp inspection
Source Mac Validation      : Disabled
Destination Mac Validation : Disabled
IP Address Validation      : Disabled
Vlan     Configuration     ACL Match     Static ACL
================================================================
1        enabled           acl
Vlan     ACL Logging     DHCP Logging
================================================================
1        deny            deny
Vlan     Forwarded      Dropped     DHCP Drops     ACL Drops
================================================================
1        0              0           0              0
Vlan     DHCP Permits     ACL Permits     Source MAC Failures
================================================================
1        0                0               0
Vlan     Dest MAC Failures     IP Validation Failures     Invalid Protocol Data
================================================================
1        0                     0                         0
```

## Related Commands

ip arp inspection vlan

# 11.12.2 show ip arp inspection interfaces

## Command Purpose

Use this command to display the arp inspection configuration of specified interface.

## Command Syntax

show ip arp inspection interfaces ( *IFNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | Interface name | Support physical/aggregation/loopback/vlan/tunnel ports |

## Command Mode

Privileged EXEC

## Default

No default is defined.

## Usage

This command is used to show the arp inspection configuration on interface.

## Examples

This example shows how to display all the arp inspection configuration of all interface.:

```
Switch# show ip arp inspection interfaces
Interface       Trust State
================================
eth-0-1         untrusted
eth-0-2         untrusted
eth-0-3         untrusted
eth-0-4         untrusted
eth-0-5         untrusted
eth-0-6         untrusted
eth-0-7         untrusted
eth-0-8         untrusted
eth-0-9         untrusted
eth-0-10        untrusted
eth-0-11        untrusted
eth-0-12        untrusted
eth-0-13        untrusted
eth-0-14        untrusted
eth-0-15        untrusted
eth-0-16        untrusted
eth-0-17        untrusted
eth-0-18        untrusted
eth-0-19        untrusted
eth-0-20        untrusted
eth-0-21        untrusted
eth-0-22        untrusted
eth-0-23        untrusted
eth-0-24        untrusted
eth-0-25        untrusted
eth-0-26        untrusted
eth-0-27        untrusted
eth-0-28        untrusted
eth-0-29        untrusted
eth-0-30        untrusted
eth-0-31        untrusted
eth-0-32        untrusted
eth-0-33        untrusted
eth-0-34        untrusted
eth-0-35        untrusted
```

```
eth-0-36        untrusted
eth-0-37        untrusted
eth-0-38        untrusted
eth-0-39        untrusted
eth-0-40        untrusted
eth-0-41        untrusted
eth-0-42        untrusted
eth-0-43        untrusted
eth-0-44        untrusted
eth-0-45        untrusted
eth-0-46        untrusted
eth-0-47        untrusted
eth-0-48        untrusted
```

### Related Commands

ip arp inspection trust

## 11.12.3 show ip arp inspection log

### Command Purpose

Use this command to display the log configuration and log information in arp inspection log buffer. The default number is 32.

### Command Syntax

show ip arp inspection log ( *NUMBER* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NUMBER | Specify the number of message | 1-1024 |

### Command Mode

Privileged EXEC

### Default

No default is defined.

### Usage

This command is used to verify arp inspection log settings.

## Examples

This example shows how to display the log information in arp inspection log buffer.:

```
Switch# show ip arp inspection log
Total Log Buffer Size : 32
Syslog rate : 5 entries per 1 seconds.
No entries in log buffer
```

## Related Commands

ip arp inspection log-buffer

# 11.12.4 show ip arp inspection statistics

## Command Purpose

Use this command to displays statistics for forwarded, dropped, MAC validation failure, IP validation failure, ACL permitted and denied, and DHCP permitted and denied packets for the specified vlan. If no vlans are specified or if a range is specified, displays information only for vlans with ARP Inspection enabled.

## Command Syntax

show ip arp inspection statistics ( vlan *VLAN_RNG_STR* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| vlan VLAN_RNG_STR | Selected vlan range | valid vlan ID range is 1-4094.Use short bar(-) to describe continuous VLANs, use comma(,) to describe non-continuous VLANs. For example:1，3-5，7，9-11 |

## Command Mode

Privileged EXEC

## Default

No default is defined.

## Usage

Displays statistics for forwarded, dropped, MAC validation failure, IP validation failure, ACL permitted and denied, and DHCP permitted and denied packets for the specified VLAN.

## Examples

This example shows how to display the arp inspection statistics:

```
Switch# show ip arp inspection statistics vlan 1
Vlan     Forwarded      Dropped     DHCP Drops     ACL Drops
=============================================================
1        0              0           0              0
Vlan     DHCP Permits     ACL Permits     Source MAC Failures
=============================================================
1        0                0               0
Vlan     Dest MAC Failures     IP Validation Failures     Invalid Protocol Data
=============================================================
1        0                     0                          0
```

## Related Commands

clear ip arp inspection statistics

# 11.12.5 show ip arp inspection vlan

## Command Purpose

Use this command to displays the configuration and the operating state of ARP Inspection for the specified vlan.

## Command Syntax

show ip arp inspection vlan *VLAN_RNG_STR*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| vlan VLAN_RNG_STR | Selected vlan range | valid vlan ID range is 1-4094.Use short bar(-) to describe continuous VLANs, use comma(,) to describe non-continuous VLANs. For example:1，3-5，7，9-11 |

## Command Mode

Privileged EXEC

## Default

No default is defined.

## Usage

If no vlans are specified or if a range is specified, displays information only for vlans with ARP Inspection enabled.

## Examples

This example shows how to display the arp inspection statistics:

```
Switch# show ip arp inspection vlan 1
Source Mac Validation      : Disabled
Destination Mac Validation : Disabled
IP Address Validation      : Disabled
Vlan    Configuration      ACL Match     Static ACL
================================================================
1        enabled           acl
Vlan     ACL Logging     DHCP Logging
================================================================
1        deny            deny
```

## Related Commands

ip arp inspection vlan

# 11.12.6 show debugging arp inspection

## Command Purpose

Use this command to display the debug information of ARP Inspection.

## Command Syntax

show debugging arp inspection

### Command Mode

Privileged EXEC

### Default

No default is defined.

### Usage

This command is used to show the general configuration of arp inspection.

### Examples

This example shows how to display the debug information of ARP Inspection:

```
Switch# show debugging arp inspection
arp inspection debugging status:
  packet debugging is on
  error debugging is on
```

### Related Commands

debug arp inspection

## 11.12.7 debug arp inspection

### Command Purpose

Use this command to configure ARP Inspection debug.

### Command Syntax

debug arp inspection ( all | packet | events | error )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| all | Turn all debugging on | - |
| packet | ARP message fields | - |
| events | ARP Inspection events | - |
| error | Error DHCP message | - |

### Command Mode

Privileged EXEC

### Default

All debug disabled.

### Usage

This command is used to debug arp inspection, including all, error, events, packet.

### Examples

This example shows how to use this command to debug all error ARP packet:

```
Switch# debug ip arp inspection error
```

### Related Commands

show debugging arp inspection

## 11.12.8 ip arp inspection filter vlan

### Command Purpose

Use this command to applies the ARP ACL to a VLAN.

### Command Syntax

ip arp inspection filter acl vlan *VLAN_RNG_STR* ( static | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| acl | ARP acl name | - |
| VLAN_RNG_STR | Selected vlan range | valid vlan ID range is 1-4094.Use short bar(-) to describe continuous VLANs, use comma(,) to describe non-continuous VLANs. For example:1，3-5，7，9-11 |
| static | Apply the ACL statically | - |

### Command Mode

Global Configuration

### Default

No default is defined.

### Usage

This command is used to show the general configuration of arp inspection.

### Examples

This example shows how to apply the ARP ACL to a vlan 2:

```
Switch# configure terminal
Switch(config)# ip arp inspection filter acl vlan 2 static
```

### Related Commands

arp access-list

## 11.12.9 ip arp inspection log-buffer entries

### Command Purpose

Use this command to set log-buffer size.

### Command Syntax

ip arp inspection log-buffer entries *NUMBER*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NUMBER | Number of log buffer | 10-1024 |

### Command Mode

Global Configuration

## Default

None

## Usage

The no command reverts the log-buffer to the default buffer size (32).

## Examples

This example shows how to set log-buffer size to 10:

```
Switch# configure terminal
Switch(config)# ip arp inspection log-buffer entries 10
```

## Related Commands

show ip arp inspection log

# 11.12.10 ip arp inspection log-buffer logs interval

## Command Purpose

Use this command to configure the DAI logging system messages. The no command reverts the default system message configuration.

## Command Syntax

ip arp inspection log-buffer logs *NUMBER* interval *INTERVAL*

no ip arp inspection log-buffer logs

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NUMBER | Number of log buffer | 0-1024 |
| INTERVAL | Interval (seconds) | 0-86400 seconds |

## Command Mode

Global Configuration

## Default

Default number of log buffer is 5, default interval is 1

## Usage

An interval of 0 indicates that the log will be recorded into syslog immediately.

If the interval is not 0,a logs of 0 indicates that the log will not be recorded into syslog;if logs is not 0,the logs log will be recorded into syslog every interval time.

## Examples

This example shows how to configure logging to send 12 messages every 2 seconds:

```
Switch# configure terminal
Switch(config)# ip arp inspection log-buffer logs 12 interval 2
```

## Related Commands

None

# 11.12.11 ip arp inspection validate

## Command Purpose

Use this command to enable additional validation on the destination MAC address, the sender and target IP addresses, and the source MAC address.

## Command Syntax

[ no ] ip arp inspection validate ( dst-mac | ip | src-mac )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| dst-mac | Validate destination MAC address | - |
| ip | Validate IP addresses | - |
| src-mac | Validate source MAC address | - |

## Command Mode

Global Configuration

## Default

No default is defined.

## Usage

For src-mac, check the source MAC address in the Ethernet header against the sender MAC address in the ARP body. This check is performed on both ARP requests and responses. When enabled, packets with different MAC addresses are classified as invalid and are dropped.

For dst-mac, check the destination MAC address in the Ethernet header against the target MAC address in ARP body. This check is performed for ARP responses. When enabled, packets with different MAC addresses are classified as invalid and are dropped.

For ip, check the ARP body for invalid and unexpected IP addresses. Addresses include 0.0.0.0, 255.255.255.255, and all IP multicast addresses. Sender IP addresses are checked in all ARP requests and responses, and target IP addresses are checked only in ARP responses.

## Examples

This example shows how to enable additional validation on the destination MAC address.:

```
Switch# configure terminal
Switch(config)# ip arp inspection validate dst-mac
```

## Related Commands

show ip arp inspection

# 11.12.12 ip arp inspection vlan

## Command Purpose

Use this command to enable ARP Inspection on vlans.

## Command Syntax

[ no ] ip arp inspection vlan *VLAN_ID*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan range | valid vlan ID range is 1-4094.Use short bar(-) to describe continuous VLANs, use comma(,) to describe non-continuous VLANs. For example:1，3-5，7，9-11 |

## Command Mode

Global Configuration

## Default

No default is defined.

## Usage

Enable ARP Inspection on vlans.

## Examples

This example shows how to enable ARP Inspection on VLAN 2.:

```
Switch# configure terminal
Switch(config)# ip arp inspection vlan 2
```

## Related Commands

show ip arp inspection vlan 2

# 11.12.13 ip arp inspection vlan logging acl-macth

## Command Purpose

Use this command to configure ARP Inspection log filtering.

## Command Syntax

[ no ] ip arp inspection vlan *VLAN_ID* logging acl-macth ( matchlog | none )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan range | valid vlan ID range is 1-4094.Use short bar(-) to describe continuous VLANs, use comma(,) to describe non-continuous VLANs. For example:1，3-5，7，9-11 |
| matchlog | Log packets on ACE logging configuration | - |
| none | Do not log packets that match ACLs | - |

## Command Mode

Global Configuration

## Default

No default is defined.

## Usage

If you specify the matchlog keyword in this command and the log keyword in the permit or deny ARP access-list configuration command, ARP packets permitted or denied by the ARP Inspection are logged.

## Examples

This example shows how to log permitted ARP packets on vlan 2:

```
Switch# configure terminal
Switch(config)# ip arp inspection vlan 2 logging acl-match matchlog
```

### Related Commands

ip arp inspection vlan

## 11.12.14 ip arp inspection vlan logging dhcp-bindings

### Command Purpose

Use this command to configure ARP Inspection log filtering.

### Command Syntax

[ no ] ip arp inspection vlan *VLAN_ID* logging dhcp-bindings ( all | none | permit )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan range | valid vlan ID range is 1-4094.Use short bar(-) to describe continuous VLANs, use comma(,) to describe non-continuous VLANs. For example:1，3-5，7，9-11 |
| all | Log all packets that match DHCP bindings | - |
| permit | Log DHCP Binding Permitted packets | - |
| none | Do not log packets that match DHCP bindings | - |

### Command Mode

Global Configuration

### Default

No default is defined.

### Usage

If the command is set, the information that match the dhcp-bings will be loged.

### Examples

This example shows how to Logs all packets that match DHCP bindings on vlan 2:

```
Switch# configure terminal
Switch(config)# ip arp inspection vlan 2 logging dhcp-bindings all
```

### Related Commands

show ip arp inspection vlan

## 11.12.15 clear ip arp inspection log-buffer

### Command Purpose

Use this command to delete all log in log-buffer.

### Command Syntax

clear ip arp inspection log-buffer

### Command Mode

Privileged EXEC

### Default

No default is defined.

### Usage

This command is used to delete all log in log-buffer.

### Examples

This example shows how to delete all log in log-buffer:

```
Switch# clear ip arp inspection log-buffer
```

### Related Commands

ip arp inspection log-buffer logs

## 11.12.16 clear ip arp inspection statistics

### Command Purpose

Use this command to delete all statistics of ARP Inspection.

### Command Syntax

clear ip arp inspection statistics

### Command Mode

Global Configuration

### Default

No default is defined.

### Usage

This command is used to delete all statistics of ARP Inspection.

### Examples

This example shows how to delete all statistics of ARP Inspection:

```
Switch(config)# clear ip arp inspection statistics
```

### Related Commands

show ip arp inspection statistics

## 11.12.17 ip arp inspection trust

### Command Purpose

Use this command to configure the ARP Inspection interface trust state.

### Command Syntax

ip arp inspection trust

no ip arp inspection trust

### Command Mode

Interface Configuration

### Default

No default is defined.

### Usage

In a typical network configuration, you configure all switch ports connected to host ports as untrusted and configure all switch ports connected to switches as trusted.

### Examples

This example shows how to configure the ARP Inspection interface eth-0-2 untrusted state:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no ip arp inspection trust
```

### Related Commands

show ip arp inspection interfaces

## 11.12.18 arp access-list

### Command Purpose

Use this command to configure a ARP ACL

### Command Syntax

arp access-list *ACL_NAME*

no arp access-list *ACL_NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ACL_NAME | A arp access-list name | String with up to 40 characters |

## Command Mode

Global Configuration

## Default

No default is defined.

## Usage

In non-DHCP environments, dynamic ARP inspection can validate ARP packets against user-configured ARP access control lists (ACLs) for hosts with statically configured IP addresses.

## Examples

This example shows how to configure a ARP ACL:

```
Switch# configure terminal
Switch(config)# arp access-list acl1
```

## Related Commands

show access-list arp

# 11.12.19 ip mac

## Command Purpose

Use this command to configure ARP ACEs.

## Command Syntax

( deny | permit ) ( request | response | ) ip ( *IP_ADDR IP_ADDR_MASK* | any | host *IP_ADDR* ) mac ( *MAC_ADDR MAC_ADDR_MASK* | any | host *MAC_ADDR* ) ( log | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| deny | Specify packets to reject | - |
| permit | Log all packets that match DHCP bindings | - |
| request | Log DHCP Binding Permitted packets | - |
| response | Do not log packets that match DHCP bindings | - |
| IP_ADDR | Sender address | IPv4 address |
| IP_ADDR_MASK | Sender wildcard bits | IPv4 wildcard |
| any | Any sender host | - |
| host | A single Sender host | - |
| MAC_ADDR | Sender host's MAC address | MAC address in HHHH.HHHH.HHHH format |
| MAC_ADDR_MASK | Sender wildcard | MAC wildcard in HHHH.HHHH.HHHH format |
| log | Log at match | - |

## Command Mode

ARP ACL Configuration

## Default

No default is defined.

## Usage

Use this command to add ARP ACE to ARP ACL.

## Examples

This example shows how to configure a ARP ACE:

```
Switch# configure terminal
Switch(config)# arp access-list acl1
Switch(config-arp-acl)# permit ip host 192.168.1.1 mac any
```

## Related Commands

show access-list arp

# 11.12.20 no sequence-num

## Command Purpose

Use this command to delete a ARP ACE.

## Command Syntax

no sequence-num *NUMBER*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NUMBER | Specify a sequence number | 1-131071 |

## Command Mode

ARP ACL Configuration

## Default

No default is defined.

## Usage

This command is used to delete ARP ACE configured.

## Examples

This example shows how to delete a ARP ACE:

```
Switch# configure terminal
Switch(config)# arp access-list acl1
Switch(config-arp-acl)# no sequence-num 10
```

## Related Commands

show access-list arp

# 11.12.21 show access-list arp

## Command Purpose

Use this command to display the arp acl configuration.

## Command Syntax

show access-list arp ( *ACL_NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ACL_NAME | A arp access-list name | String with up to 40 characters |

## Command Mode

Privileged EXEC

## Default

No default is defined.

## Usage

This command is used to display the arp acl configured by arp acl.

## Examples

This example shows how to display arp ace:

```
Switch# show access-list arp
arp access-list acl
 10 permit request ip 1.1.1.1 0.255.255.255 mac any
```

## Related Commands

arp access-list

# 11.13 DHCP Snooping Commands

## 11.13.1 clear dhcp snooping

### Command Purpose

Use the clear dhcp snooping global configuration command on the switch to clear dynamic entries in DHCP binding database or the DHCP snooping statistics counters.

### Command Syntax

clear dhcp snooping ( bindings ( learning | manual ) ( ipv4 *IP_ADDR* | mac *MAC_ADDR* | vlan *VLAN_ID* | interface *IFNAME* | ) | statistics )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| bindings | Clear the DHCP snooping binding database | - |
| IP_ADDR | Clear the binding entry by IP address | IPv4 Address |
| MAC_ADDR | Clear the binding entry by MAC address | MAC Address |
| VLAN_ID | Clear the binding entry by VLAN | 1-4094 |
| IFNAME | Clear the binding entry by interface | Support physical and AGG interfaces |
| statistics | Clear the DHCP snooping statistics counter | - |

### Command Mode

Global Configuration

### Default

No default is defined.

### Usage

This command is used to clear DHCP snooping binding or statistics.

### Examples

This example shows how to clear the DHCP snooping statistics counters:

```
Switch(config)# clear dhcp snooping statistics
```

### Related Commands

show dhcp snooping binding

show dhcp snooping statistics

## 11.13.2 dhcp snooping

### Command Purpose

Use the dhcp snooping global configuration command on the switch to globally enable DHCP snooping. Use the no form of this command to return to the default setting.

### Command Syntax

dhcp snooping

no dhcp snooping

### Command Mode

Global Configuration

### Default

DHCP snooping is disabled.

### Usage

For any DHCP snooping configuration to take effect, you must globally enable DHCP snooping. DHCP snooping is not active until you enable snooping on a VLAN by using the dhcp snooping vlan vlan-id global configuration command.

You can verify your settings by entering the show dhcp snooping config privileged EXEC command.

### Examples

This example shows how to enable DHCP snooping:

```
Switch# configure terminal
Switch(config)# dhcp snooping
```

### Related Commands

dhcp snooping vlan

show dhcp snooping config

## 11.13.3 dhcp snooping binding

### Command Purpose

Use the dhcp snooping binding global configuration command on the switch to configure the DHCP snooping binding database and to add binding entries to the database.

### Command Syntax

dhcp snooping binding mac *MAC_ADDR* vlan *VLAN_ID* ipv4 *IP_ADDR* interface *IFNAME* expiry *SECONDS*

no dhcp snooping bindings ( ipv4 *IP_ADDR* | mac *MAC_ADDR* | vlan *VLAN_ID* | interface *IFNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MAC_ADDR | Specify a MAC address | MAC Address |
| VLAN_ID | Specify a VLAN number. | 1-4094 |
| IP_ADDR | Specify an IP address | IPv4 Address |
| IFNAME | Specify an interface on which to add or delete a binding entry | Support physical and AGG interfaces |
| expiry SECONDS | Specify the interval (in seconds) after which the binding entry is no longer valid. | 0 - 86400 |

## Command Mode

Global Configuration

## Default

No default database is defined.

## Usage

Use this command when you are testing or debugging the switch.

In the DHCP snooping binding database, each database entry, also referred to a binding, has an IP address, an associated MAC address, the lease time, the interface to which the binding applies, and the VLAN to which the interface belongs.

Use the show dhcp snooping binding privileged EXEC command to display the configured bindings.

## Examples

This example shows how to generate a DHCP binding configuration with an expiration time of 1000 seconds on a port in VLAN 1:

```
Switch# configure terminal
Switch(config)# dhcp snooping binding mac 0001.000c.01ef vlan 1 ipv4 10.10.1.1
interface eth-0-1 expiry 1000
```

## Related Commands

dhcp snooping

show dhcp snooping binding

# 11.13.4 dhcp snooping no-binding vlan

## Command Purpose

Use the dhcp snooping no-binding vlan global configuration command on the switch to enable DHCP snooping do not record dynamic binding table of specified VLAN. Use the no form of this command to return to the default setting.

## Command Syntax

dhcp snooping no-binding vlan *VLAN-RANGE*

no dhcp snooping no-binding vlan *VLAN-RANGE*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN-RANGE | Specify a VLAN ID or a range of VLANs on which to enable DHCP snooping no-binding. | 1-4094 |

## Command Mode

Global Configuration

## Default

DHCP snooping no-binding is disabled on all VLANs.

## Usage

You can enter a single VLAN ID identified by VLAN ID number, a series of VLAN IDs separated by commas, a range of VLAN IDs separated by hyphens, or a range of VLAN IDs separated by entering the starting and ending VLAN IDs separated by a space.Existed dhcp snooping dynamic recording tables of a VLAN will be deleted when no-binding is enabled on this VLAN.

## Examples

This example shows how to enable DHCP snooping no-binding on VLAN 10:

```
Switch# configure terminal
Switch(config)# dhcp snooping no-binding vlan 10
```

## Related Commands

show dhcp snooping config

# 11.13.5 dhcp snooping database

## Command Purpose

Use the dhcp snooping database global configuration command on the switch to configure the DHCP snooping binding database agent.

Use the no form of this command to disable the agent, to reset the timeout value, or to reset the write-delay value.

## Command Syntax

dhcp snooping database auto-save interval *SECONDS*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| interval SECONDS | Specify the interval (in seconds) that how long to save the binding database. | 15 - 1200 seconds |

## Command Mode

Global Configuration

## Default

Default interval is 600 seconds.

## Usage

The DHCP snooping database is save as flash:/dhcpsnooping.

## Examples

The following is sample output from the dhcp snooping database command:

```
Switch# configure terminal
Switch(config)# dhcp snooping database auto-save interval 120
```

## Related Commands

dhcp snooping

dhcp snooping binding

## 11.13.6 dhcp snooping information option

### Command Purpose

Use the dhcp snooping information option global configuration command on the switch to enable DHCP option-82 data insertion. Use the no form of this command to disable DHCP option-82 data insertion.

### Command Syntax

dhcp snooping information option

no dhcp snooping information option

### Command Mode

Global Configuration

### Default

DHCP option-82 data is not inserted.

### Usage

You must globally enable DHCP snooping by using the dhcp snooping global configuration command for any DHCP snooping configuration to take effect.

When the option-82 feature is enabled and a switch receives a DHCP request from a host, it adds the option-82 information in the packet. The option-82 information contains the switch MAC address (the remote ID suboption) and the port identifier, vlan-mod-port, from which the packet is received (circuit ID suboption). The switch forwards the DHCP request that includes the option-82 field to the DHCP server.

When the DHCP server receives the packet, it can use the remote ID, the circuit ID, or both to assign IP addresses and implement policies, such as restricting the number of IP addresses that can be assigned to a single remote ID or a circuit ID. Then the DHCP server echoes the option-82 field in the DHCP reply.

The DHCP server unicasts send the reply to the switch if the request has been relayed to the server by the switch. When the client and server are on the same subnet, the server broadcasts the reply. The switch inspects the remote ID and possibly the circuit ID fields to verify that it originally inserted the option-82 data. The switch removes the option-82 field and forwards the packet to the switch port that connects to the DHCP host that sent the DHCP request.

## Examples

This example shows how to enable DHCP option-82 data insertion:

```
Switch# configure terminal
Switch(config)# dhcp snooping information option
```

You can verify your settings by entering the show dhcp snooping config privileged EXEC command.:

```
Switch# show dhcp snooping config
dhcp snooping service: enabled
dhcp snooping switch: enabled
Verification of hwaddr field: enabled
Insertion of relay agent information (option 82): enabled
Relay agent information (option 82) on untrusted port: not allowed
dhcp snooping vlan 1
```

## Related Commands

show dhcp snooping config

show dhcp snooping binding

# 11.13.7 dhcp snooping information option allow-untrusted

## Command Purpose

Use the dhcp snooping information option allow-untrusted global configuration command on an aggregation switch to configure it to accept DHCP packets with option-82 information that are received on untrusted ports that might be connected to an edge switch. Use the no form of this command to return to the default setting.

## Command Syntax

dhcp snooping information option allow-untrusted

no dhcp snooping information option allow-untrusted

## Command Mode

Global Configuration

## Default

The switch drops DHCP packets with option-82 information that are received on untrusted ports that might be connected to an edge switch.

## Usage

You might want an edge switch to which a host is connected to insert DHCP option-82 information at the edge of your network. You might also want to enable DHCP security features, such as DHCP snooping, IP source guard, or dynamic Address Resolution Protocol (ARP) inspection, on an aggregation switch. However, if DHCP snooping is enabled on the aggregation switch, the switch drops packets with option-82 information that are received on an untrusted port and does not learn DHCP snooping bindings for connected devices on a trusted interface.

If the edge switch to which a host is connected inserts option-82 information and you want to use DHCP snooping on an aggregation switch, enter the dhcp snooping information option allow-untrusted command on the aggregation switch. The aggregation switch can learn the bindings for a host even though the aggregation switch receives DHCP snooping packets on an untrusted port. You can also enable DHCP security features on the aggregation switch. The port on the edge switch to which the aggregation switch is connected must be configured as a trusted port.

## Examples

This example shows how to configure an access switch to not check the option-82 information in untrusted packets from an edge switch and to accept the packets:

```
Switch# configure terminal
Switch(config)# dhcp snooping information option allow-untrusted
```

### Related Commands

show dhcp snooping config

## 11.13.8 dhcp snooping information option allow-untrusted (interface)

### Command Purpose

Use the dhcp snooping information option allow-untrusted interface configuration command on an aggregation switch to configure it to accept DHCP packets with option-82 information that are received on untrusted ports that might be connected to an edge switch. Use the no form of this command to return to the default setting.

### Command Syntax

dhcp snooping information option allow-untrusted

no dhcp snooping information option allow-untrusted

### Command Mode

Interface Configuration

### Default

Allow-untrusted is not configured on interface.DHCP packets with Option-82 will be processed according to global configuration.

### Usage

You might want an edge switch to which a host is connected to insert DHCP option-82 information at the edge of your network. You might also want to enable DHCP security features, such as DHCP snooping, IP source guard, or dynamic Address Resolution Protocol (ARP) inspection, on an aggregation switch. However, if DHCP snooping is enabled on the aggregation switch, the switch drops packets with

option-82 information that are received on an untrusted port and does not learn DHCP snooping bindings for connected devices on a trusted interface.

If the edge switch to which a host is connected inserts option-82 information and you want to use DHCP snooping on an aggregation switch, enter the dhcp snooping information option allow-untrusted command on the aggregation switch. The aggregation switch can learn the bindings for a host even though the aggregation switch receives DHCP snooping packets on an untrusted port. You can also enable DHCP security features on the aggregation switch. The port on the edge switch to which the aggregation switch is connected must be configured as a trusted port.

### Examples

This example shows how to configure an interface to not check the option-82 information in untrusted packets from an edge switch and to accept the packets:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# dhcp snooping information option allow-untrusted
```

### Related Commands

show dhcp snooping config

## 11.13.9 dhcp snooping trust

### Command Purpose

Use the dhcp snooping trust interface configuration command on the switch to configure a port as trusted for DHCP snooping purposes. Use the no form of this command to return to the default setting.

### Command Syntax

dhcp snooping trust

no dhcp snooping trust

### Command Mode

Interface Configuration

### Default

DHCP snooping trust is disabled.

### Usage

Configure as trusted ports those that are connected to a DHCP server or to other switches or routers. Configure as untrusted ports those that are connected to DHCP clients.

### Examples

This example shows how to enable DHCP snooping trust on a port:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# dhcp snooping trust
```

### Related Commands

show dhcp snooping config

## 11.13.10 dhcp snooping no-binding

### Command Purpose

Use the dhcp snooping no-binding interface configuration command on the switch to configure a port do not record dynamic recording table for DHCP snooping. Use the no form of this command to return to the default setting.

### Command Syntax

dhcp snooping no-binding

no dhcp snooping no-binding

### Command Mode

Interface Configuration

### Default

DHCP snooping no-binding is disabled.

### Usage

Existed DHCP snooping dynamic recordings on a port will be deleted when no-binding enabled on this port.

### Examples

This example shows how to enable DHCP snooping no-binding on a port:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# dhcp snooping no-binding
```

### Related Commands

None

## 11.13.11 dhcp snooping verify

### Command Purpose

Use the dhcp snooping verify global configuration command on the switch to configure the switch to verify on an untrusted port that the source MAC address in a DHCP packet matches the client hardware address. Use the no form of this command to configure the switch to not verify the MAC addresses.

### Command Syntax

dhcp snooping verify mac-address

no dhcp snooping verify mac-address

### Command Mode

Global Configuration

## Default

The switch verifies the source MAC address in a DHCP packet that is received on untrusted ports matches the client hardware address in the packet.

## Usage

In a service-provider network, when a switch receives a packet from a DHCP client on an untrusted port, it automatically verifies that the source MAC address and the DHCP client hardware address match. If the addresses match, the switch forwards the packet. If the addresses do not match, the switch drops the packet.

## Examples

This example shows how to disable the MAC address verification:

```
Switch# configure terminal
Switch(config)# no dhcp snooping verify mac-address
```

## Related Commands

show dhcp snooping config

# 11.13.12 dhcp snooping vlan

## Command Purpose

Use the dhcp snooping vlan global configuration command on the switch to enable DHCP snooping on a VLAN. Use the no form of this command to return to the default setting.

## Command Syntax

dhcp snooping vlan *VLAN-RANGE*

no dhcp snooping vlan *VLAN-RANGE*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN-RANGE | Specify a VLAN ID or a range of VLANs on which to enable DHCP snooping. | 1-4094 |

### Command Mode

Global Configuration

### Default

DHCP snooping is disabled on all VLANs.

### Usage

You can enter a single VLAN ID identified by VLAN ID number, a series of VLAN IDs separated by commas, a range of VLAN IDs separated by hyphens, or a range of VLAN IDs separated by entering the starting and ending VLAN IDs separated by a space.

You must first globally enable DHCP snooping before enabling DHCP snooping on a VLAN.

### Examples

This example shows how to enable DHCP snooping on VLAN 10:

```
Switch# configure terminal
Switch(config)# dhcp snooping vlan 10
```

### Related Commands

show dhcp snooping config

## 11.13.13 dhcp snooping vlan information option format-type circuit-id string

### Command Purpose

Use this interface configuration command on the switch stack or on a standalone switch to configure the option-82 circuit-ID suboption. Use the no form of this command to configure the default circuit-ID suboption.

## Command Syntax

dhcp snooping vlan *VLAN_ID* information option format-type circuit-id string *STRING*

no dhcp snooping vlan *VLAN_ID* information option format-type circuit-id string

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Specify a VLAN ID. | 1-4094 |
| STRING | ASCII string for circuit id | ASCII string with up to 63 characters |

## Command Mode

Interface Configuration

## Default

None

## Usage

User must globally enable DHCP snooping configuration command for any DHCP snooping configuration to take effect.

## Examples

This example shows how configure the option-82 circuit-ID suboption:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# dhcp snooping vlan 2 information option format-type circuit-id
string vlan2
```

## Related Commands

None

# 11.13.14 dhcp snooping information option format remote-id

## Command Purpose

Use the dhcp snooping information option format remote-id global configuration command on the switch stack or on a standalone switch to configure the option-82 remote-ID suboption. Use the no form of this command to configure the default remote-ID suboption.

## Command Syntax

dhcp snooping information option format remote-id ( string *NAME* | hostname )

no dhcp snooping information option format remote-id

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | Specify a remote ID | ASCII string with up to 63 characters(no spaces) |
| hostname | Specify the switch hostname as the remote ID | - |

## Command Mode

Global Configuration

## Default

None

## Usage

You must globally enable DHCP snooping configuration command for any DHCP snooping configuration to take effect.

## Examples

This example shows how configure the option-82 remote-ID suboption:

```
Switch# configure terminal
Switch(config)# dhcp snooping information option format remote-id hostname
```

## Related Commands

None

# 11.13.15 dhcp snooping information option format remote-id(interface)

## Command Purpose

Use the dhcp snooping information option format remote-id interface configuration command on the switch stack or on a standalone switch to configure the option-82 remote-ID suboption. Use the no form of this command to configure the default remote-ID suboption.

## Command Syntax

dhcp snooping information option format remote-id ( string *NAME* | hostname )

no dhcp snooping information option format remote-id

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | Specify a remote ID | ASCII string with up to 63 characters(no spaces) |
| hostname | Specify the switch hostname as the remote ID | - |

## Command Mode

Interface Configuration

## Default

None

## Usage

You must globally enable DHCP snooping configuration command for any DHCP snooping configuration to take effect.The port configuration takes precedence over the global configuration.

## Examples

This example shows how configure the option-82 remote-ID on interface:

```
Switch# configure terminal
Switch(config)# interface eth-0-17
Switch(config-if)# dhcp snooping information option format remote-id hostname
```

## Related Commands

None

# 11.13.16 dhcp snooping vlan information option format circuit-id

## Command Purpose

Use this interface configuration command on the switch stack or on a standalone switch to configure the option-82 circuit-ID suboption. Use the no form of this command to configure the default circuit-ID suboption.

## Command Syntax

dhcp snooping ( vlan *VLAN_ID* | ) information option format circuit-id { vlan-id | ifname | hostname | mac | string *STRING* }

no dhcp snooping vlan *VLAN_ID* information option format circuit-id

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Specify a VLAN ID. | 1-4094 |
| STRING | ASCII string for circuit id | ASCII string with up to 63 characters |
| hostname | Switch hostname | - |
| ifname | Interface name | - |
| mac | Interface mac | - |
| vlan-id | Vlan ID | - |

## Command Mode

Interface Configuration

## Default

None

## Usage

User must globally enable DHCP snooping configuration command for any DHCP snooping configuration to take effect.

## Examples

This example shows how configure the option-82 circuit-ID suboption:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# dhcp snooping vlan 2 information option format-type circuit-id
string vlan2
```

## Related Commands

None

# 11.13.17 dhcp snooping information option format circuit-id vlan

## Command Purpose

Use this global configuration command on the switch stack or on a standalone switch to configure the option-82 circuit-ID suboption. Use the no form of this command to configure the default circuit-ID suboption.

## Command Syntax

dhcp snooping information option format circuit-id ( vlan *VLAN_ID* | ) { vlan-id | ifname | hostname | mac | string *STRING* }

no dhcp snooping information option format circuit-id ( vlan *VLAN_ID* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Specify a VLAN ID. | 1-4094 |
| STRING | ASCII string for circuit id | ASCII string with up to 63 characters |
| hostname | Switch hostname | - |

| | | |
|---|---|---|
| ifname | Interface name | - |
| mac | Interface mac | - |
| vlan-id | Vlan ID | - |

## Command Mode

Global Configuration

## Default

None

## Usage

User must globally enable DHCP snooping configuration command for any DHCP snooping configuration to take effect.

## Examples

This example shows how to configure the option82 circuit-id in all vlan:

```
Switch# configure terminal
Switch(config)# dhcp snooping information option format circuit-id ifname mac
hostname
Switch(config)#
```

## Related Commands

None

# 11.13.18 dhcp snooping information option format remote-id vlan

## Command Purpose

Use the dhcp snooping information option format remote-id global configuration command on the switch stack or on a standalone switch to configure the option-82 remote-ID suboption. Use the no form of this command to configure the default remote-ID suboption.

## Command Syntax

dhcp snooping information option format remote-id ( vlan *VLAN_ID* | ) { vlan-id | ifname | hostname | mac | string *STRING* }

no dhcp snooping information option format remote-id

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Specify a VLAN ID. | 1-4094 |
| STRING | ASCII string for circuit id | ASCII string with up to 63 characters |
| hostname | Switch hostname | - |
| ifname | Interface name | - |
| mac | Interface mac | - |
| vlan-id | Vlan ID | - |

## Command Mode

Global Configuration

## Default

None

## Usage

You must globally enable DHCP snooping configuration command for any DHCP snooping configuration to take effect.

## Examples

This example shows how configure the option-82 remote-ID suboption:

```
Switch# configure terminal
Switch(config)# dhcp snooping information option format remote-id hostname
```

## Related Commands

None

# 11.13.19 dhcp snooping vlan information option format remote-id

## Command Purpose

Use the dhcp snooping information option format remote-id interface configuration command on the switch stack or on a standalone switch to configure the option-82 remote-ID suboption. Use the no form of this command to configure the default remote-ID suboption.

## Command Syntax

dhcp snooping ( vlan *VLAN_ID* | ) information option format remote-id { vlan-id | ifname | hostname | mac | string *STRING* }

no dhcp snooping information option format remote-id

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Specify a VLAN ID. | 1-4094 |
| STRING | Specify a remote ID | ASCII string with up to 63 characters(no spaces) |
| hostname | Specify the switch hostname as the remote ID | - |
| ifname | Interface name | - |
| mac | Interface mac | - |
| vlan-id | Vlan ID | - |

## Command Mode

Interface Configuration

## Default

None

## Usage

You must globally enable DHCP snooping configuration command for any DHCP snooping configuration to take effect.The port configuration takes precedence over the global configuration.

## Examples

This example shows how configure the option-82 remote-ID on interface:

```
Switch# configure terminal
Switch(config)# interface eth-0-17
Switch(config-if)# dhcp snooping information option format remote-id hostname
```

## Related Commands

None

# 11.13.20 dhcp snooping information option policy(interface)

## Command Purpose

Use the dhcp snooping information option policy interface configuration command on the switch stack or on a standalone switch to configure reforwarding policy for DHCP message with option82 remote-id.

## Command Syntax

dhcp snooping information option policy ( drop | keep | replace )

no dhcp snooping information option policy

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| drop | Discard request message with option82 remote-id information | - |
| keep | Leave existing remote-id information alone | - |
| replace | Replace existing remote-id information | - |

## Command Mode

Interface Configuration

## Default

None

## Usage

Policy in the interface mode take precedence over those in the global mode.

## Examples

The following example shows how to configure the policy in interface mode to keep:

```
Switch# configure terminal
Switch(config)# interface eth-0-17
Switch(config-if)# dhcp snooping information option policy keep
Switch(config-if)#
```

## Related Commands

None

# 11.13.21 dhcp snooping information option policy

## Command Purpose

Use the dhcp snooping information option policy global configuration command on the switch stack or on a standalone switch to configure reforwarding policy for DHCP message with option82 remote-id.

## Command Syntax

dhcp snooping information option policy ( drop | keep | replace )

no dhcp snooping information option policy

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| drop | Discard request message with option82 remote-id information | - |
| keep | Leave existing remote-id information alone | - |
| replace | Replace existing remote-id information | - |

## Command Mode

Global Configuration

## Default

Replace

## Usage

Policy in the interface mode take precedence over those in the global mode.

## Examples

The following example shows how to configure the policy in global mode to keep:

```
Switch# configure terminal
Switch(config)# dhcp snooping information option policy keep
Switch(config)#
```

## Related Commands

None

# 11.13.22 dhcp snooping database ftp

## Command Purpose

Use this command to configure the dhcp snooping binding item upload to ftp server.Use the no form of this command to close upload.

## Command Syntax

dhcp snooping database ftp file *NAME* ( host ( mgmt-if | vrf *WORD* | ) *A.B.C.D* ) ( port <0-65535> | ) ( username *STRING* ) ( ( password ( 8 | ) | secret ) *STRING* ) ( interval <300-864000> | )

no dhcp snooping database ftp

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | The file name on the server | - |
| mgmt-if | Management port | - |
| vrf WORD | VPN Routing/Forwarding instance | A string with 1-31 characters |

| | | |
|---|---|---|
| A.B.C.D | The remote server IP address | - |
| port | The remote server port number | <1-65535>,default is 21 |
| username STRING | User name | - |
| password | Password for user | - |
| (8\|) | Specifies a hidden password will follow | - |
| secret | Specify the secret for the user | - |
| STRING | User password string | - |
| interval | Upload interval | range is 300-864000,uint is second,default is 300s |

## Command Mode

Global Configuration

## Default

None

## Usage

This configuration support only one, and the second configuration will override the previous configuration.

## Examples

The following example shows how to configure the local item upload to ftp server:

```
Switch(config)# dhcp snooping database ftp file test_ftp_202107132041 host mgmt-if
10.10.25.33 username admin secret admin interval 500
Switch(config)#
```

## Related Commands

dhcp snooping database ftp load

# 11.13.23 dhcp snooping database ftp load

## Command Purpose

Use this command to download the backup file on the ftp server to the local and load it to local item.

## Command Syntax

dhcp snooping database ftp load file *NAME* ( host ( mgmt-if | vrf *WORD* | ) *A.B.C.D* ) ( port <0-65535> | ) ( username *STRING* ) ( password ( 8 | ) *STRING* )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | The file name on the server | - |
| mgmt-if | Management port | - |
| vrf WORD | VPN Routing/Forwarding instance | A string with 1-31 characters |
| A.B.C.D | The remote server IP address | - |
| port | The remote server port number | <1-65535>,default is 21 |
| username STRING | User name | - |
| password | Password for user | - |
| (8\|) | Specifies a hidden password will follow | - |
| STRING | User password string | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

This command is used if the DHCP service is already on.At least the following three command are configured simultaneously to enable the DHCP service, service dhcp enable, dhcp snooping, dhcp snooping vlan VLANID.

## Examples

The following is example shows how to download backup from sever and load to local item:

```
Switch# dhcp snooping database ftp load file test_ftp_202107171555 host mgmt-if
10.10.25.33 username admin password admin
Download from URL to temporary file.
Get file from ftp://admin@10.10.25.33:21/test_ftp_202107171555
Connected to 10.10.25.33 (10.10.25.33).
220 Hello
Name (10.10.25.33:admin):
331 User name okay, need admin.
230 User logged in, proceed.
Remote system type is UNIX.
Using binary mode to transfer files.
200 Type set to I.
local: /tmp/recv20700 remote: test_ftp_202107171555
200 PORT command successful.
150 Opening BINARY mode data connection for test_ftp_202107171555 (259 Bytes).
.
226 Transfer complete. 259 bytes transferred. 0.25 KB/sec.
259 bytes received in 0.00205 secs (1.2e+02 Kbytes/sec)
Copy the temporary file to its destination.
.
259 bytes in 0.0 seconds, inf kbytes/second
-------------------------------------------------
Total number of binding item in remote file: 2
2 successful, 0 failed.
-------------------------------------------------
Invalid interfaces            :0
Invalid vlans                 :0
Invalid leases                :0
Invalid macs                  :0
Invalid ip address            :0
Invalid type                  :0
Expired leases                :0
Exceeds max limits            :0
Duplication items             :0
Out of memory                 :0
Parse failures                :0
-------------------------------------------------
```

## Related Commands

dhcp snooping database ftp

# 11.13.24 dhcp snooping database tftp

## Command Purpose

Use this command to configure the dhcp snooping binding item upload to tftp server.Use the no form of this command to close upload.

## Command Syntax

dhcp snooping database tftp file *NAME* ( host ( mgmt-if | vrf *WORD* | ) *A.B.C.D* ) ( port <0-65535> | ) ( interval <300-864000> | )

no dhcp snooping database tftp

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | The file name on the server | - |
| mgmt-if | Management port | - |
| vrf WORD | VPN Routing/Forwarding instance | A string with 1-31 characters |
| A.B.C.D | The remote server IP address | - |
| port | The remote server port number | <1-65535>,default is 69 |
| interval | Upload interval | range is 300-864000,uint is second,default is 300s |

## Command Mode

Global Configuration

## Default

None

## Usage

This configuration support only one, and the second configuration will override the previous configuration.

## Examples

The following example shows how to configure the local item upload to tftp server:

```
Switch(config)# dhcp snooping database tftp file test_tftp_202107131558 host mgmt-
if 10.10.38.160
Switch(config)#
```

## Related Commands

dhcp snooping database tftp load

# 11.13.25 dhcp snooping database tftp load

## Command Purpose

Use this command to download the backup file on the tftp server to the local and load it to local item.

## Command Syntax

dhcp snooping database tftp load file *NAME* ( host ( mgmt-if | vrf *WORD* | ) *A.B.C.D* ) ( port <0-65535> | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | The file name on the server | - |
| mgmt-if | Management port | - |
| vrf WORD | VPN Routing/Forwarding instance | A string with 1-31 characters |
| A.B.C.D | The remote server IP address | - |
| port | The remote server port number | <1-65535>,default is 69 |

## Command Mode

Privileged EXEC

## Default

None

## Usage

This command is used if the DHCP service is already on.At least the following three command are configured simultaneously to enable the DHCP service, service dhcp enable, dhcp snooping, dhcp snooping vlan VLANID.

## Examples

The following is example shows how to download backup from tftp sever and load to local item:

```
Switch#dhcp snooping database tftp load file test_tftp_202107171439 host mgmt-if
10.10.38.160
Download from URL to temporary file.
Get file from tftp://10.10.38.160/test_tftp_202107171439
.
Received 259 bytes in 0.0 seconds
Copy the temporary file to its destination.
.
259 bytes in 0.0 seconds, inf kbytes/second
-------------------------------------------------
Total number of binding item in remote file: 2
0 successful, 2 failed.
-------------------------------------------------
Invalid interfaces            :0
Invalid vlans                 :0
Invalid leases                :0
Invalid macs                  :0
Invalid ip address            :0
Invalid type                  :0
Expired leases                :0
Exceeds max limits            :0
Duplication items             :2
Out of memory                 :0
Parse failures                :0
-------------------------------------------------
```

## Related Commands

dhcp snooping database tftp

# 11.13.26 debug dhcp snooping

## Command Purpose

Use this command to turn on the debug switches of dhcp snooping module.

To restore the default, use the no form of this command

## Command Syntax

debug dhcp snooping ( events | error | dump | packet | all )

no debug dhcp snooping ( events | error | dump | packet | all )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| events | Snooping events | - |
| error | Error DHCP message | - |
| packet | DHCP message fields | - |
| dump | Dump message in hex format | - |
| all | Turn all debugging on | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

Use command "terminal monitor" to make debug messages print on the VTY immediately.

Use command "show logging buffer" to check the debug messages in the logging buffer.

## Examples

The following is sample to open dhcp snooping debug switches:

```
Switch# debug dhcp snooping all
```

## Related Commands

terminal monitor

show logging buffer

# 11.13.27 show dhcp snooping binding

## Command Purpose

Use the show dhcp snooping binding privileged EXEC command to display the DHCP snooping binding database and configuration information for all interfaces on a switch.

## Command Syntax

show dhcp snooping binding ( （all | manual | learning ） ( ipv4 *IP_ADDR* | mac *MAC_ADDR* | vlan *VLAN_ID* | interface *IFNAME* | ) summary | database )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| all | Display all entries | - |
| manual | Display static entries | - |
| learning | Display dynamic entries | - |
| MAC_ADDR | Specify MAC address | MAC Address |
| VLAN_ID | Specify a VLAN number. | 1-4094 |
| IP_ADDR | Specify an IP address | IPv4 Address |
| IFNAME | Specify an interface on which to add or delete a binding entry | Support physical and aggregation interfaces |
| summary | Display summary information of DHCP snooping bindings | - |
| database | Display stored information of DHCP snooping bindings | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

If DHCP snooping is enabled and an interface changes to the down state, the switch does not delete the statically configured bindings.

### Examples

The following is sample output from the show dhcp snooping binding command:

```
Switch# show dhcp snooping binding all
DHCP snooping binding table:
VLAN MAC Address    Interface  Lease(s)   IP Address
============================================================
1    0001.0001.0001 eth-0-2    static     1.1.1.1
```

### Related Commands

dhcp snooping binding

## 11.13.28 show dhcp snooping config

### Command Purpose

Use the show dhcp snooping privileged EXEC command to display the DHCP snooping configuration.

### Command Syntax

show dhcp snooping config

### Command Mode

Privileged EXEC

### Default

None

### Usage

This command is used to display the configuration of DHCP snooping.

### Examples

The following is sample output from the show dhcp snooping config command:

```
Switch# show dhcp snooping config
dhcp snooping service: enabled
dhcp snooping switch: enabled
Verification of hwaddr field: enabled
Insertion of relay agent information (option 82): enabled
Relay agent information (option 82) on untrusted port: not allowed
dhcp snooping vlan 1
```

### Related Commands

dhcp snooping binding

## 11.13.29 show dhcp snooping statistics

### Command Purpose

Use the show dhcp snooping statistics privileged EXEC command to display DHCP snooping statistics.

### Command Syntax

show dhcp snooping statistics

### Command Mode

Privileged EXEC

### Default

None

### Usage

This command is used to display the statistics of DHCP snooping.

### Examples

The following is sample output from the show dhcp snooping statistics command:

```
Switch# show dhcp snooping statistics
DHCP snooping statistics:
============================================================
DHCP packets                                11257
```

```
BOOTP packets                              0
Packets forwarded                          10381
Packets invalid                            844
Packets MAC address verify failed          354
Packets dropped                            516
```

### Related Commands

clear dhcp snooping statistics

## 11.13.30 show dhcp snooping trusted-sources

### Command Purpose

Use the show dhcp snooping trusted-sources command to display DHCP snooping trusted interfaces.

### Command Syntax

show dhcp snooping trusted-sources

### Command Mode

Privileged EXEC

### Default

None

### Usage

This command is used to display the trusted interfaces of DHCP snooping.

### Examples

The following is sample output from the show dhcp snooping trusted-sources command:

```
Switch# show dhcp snooping trusted-sources
List of DHCP snooping trusted interface(s):
============================================================
eth-0-2
```

### Related Commands

dhcp snooping trust

## 11.14 IP Source Guard Commands

### 11.14.1 ip source binding

### Command Purpose

Use the ip source binding global configuration command on the switch to configure static IP source bindings on the switch. Use the no form of this command to delete static bindings.

### Command Syntax

ip source binding mac *MAC_ADDR* vlan *VLAN_ID* ip *IP_ADDR* interface *IFNAME*

no ip source binding mac *MAC_ADDR* vlan *VLAN_ID* ip *IP_ADDR* interface *IFNAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MAC_ADDR | Specify a MAC address | MAC Address |
| VLAN_ID | Specify a VLAN number | 1-4094 |
| IP_ADDR | Specify an IPv4 address | IPv4 Address |
| IFNAME | Specify an interface on which to add or delete a binding entry | Support physical and aggregation interfaces |

### Command Mode

Global Configuration

### Default

None

### Usage

A static IP source binding entry has an IP address, its associated MAC address, and its associated VLAN number.

The same MAC and IP can only be bound in one binding entry. Duplication of MAC or IP in binding entries is not allowed.

No IP source bindings are configured by default.

### Examples

The following is sample output from the ip source binding command:

```
Switch# configure terminal
Switch(config)# ip source binding mac 0001.1234.1234 vlan 1 ip 172.20.50.5
interface eth-0-1
```

### Related Commands

show ip source binding

no ip source binding

## 11.14.2 ipv6 source binding

### Command Purpose

Use the ip source binding global configuration command on the switch to configure static IP source bindings on the switch. Use the no form of this command to delete static bindings.

### Command Syntax

ip source binding mac *MAC_ADDR* vlan *VLAN_ID* ipv6 *IPV6_ADDR* interface *IFNAME*

no ip source binding mac *MAC_ADDR* vlan *VLAN_ID* ipv6 *IPV6_ADDR* interface *IFNAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MAC_ADDR | Specify a MAC address | MAC Address |
| VLAN_ID | Specify a VLAN number | 1-4094 |
| IPV6_ADDR | Specify an IPv6 address | IPv6 Address |
| IFNAME | Specify an interface on which to add or delete a binding entry | Support physical and aggregation interfaces |

### Command Mode

Global Configuration

### Default

None

### Usage

A static IP source binding entry has an IP address, its associated MAC address, and its associated VLAN number.

The same MAC and IP can only be bound in one binding entry. Duplication of MAC or IP in binding entries is not allowed.

No IP source bindings are configured by default.

### Examples

The following is sample output from the ip source binding command:

```
Switch# configure terminal
Switch(config)# ip source binding mac 0001.1234.1234 vlan 1 ipv6 1::12:11 interface
eth-0-1
```

### Related Commands

show ip source binding

no ip source binding

## 11.14.3 no ip source binding entries

### Command Purpose

Use this command to delete one or more ip source binding entries.

### Command Syntax

no ip source binding entries

no ip source binding entries vlan *VLAN_ID*

no ip source binding entries interface *IFNAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Specify a VLAN number | 1-4094 |
| IFNAME | Specify an interface on which to add or delete a binding entry | Support physical and aggregation interfaces |

## Command Mode

Global Configuration

## Default

None

## Usage

If neither vlan-id nor interface-id is specified, all static ip source binding entries will be deleted.

## Examples

clear the entries of eth-0-1:

```
Switch# configure terminal
Switch(config)# no ip source binding entries interface eth-0-1
```

clear the entries of vlan2:

```
Switch# configure terminal
Switch(config)# no ip source binding entries vlan 2
```

## Related Commands

ip source binding

show ip source binding

# 11.14.4 ip source maximal binding

## Command Purpose

To specify the maximum number of bindings for each interface, use the ip source maximal binding command in global configuration mode. To restore to the default value, use the no form of this command.

## Command Syntax

ip source maximal binding number per-port *NUMBER*

no ip source maximal binding number per-port

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NUMBER | Specify maximum number of bindings | 0-30 |

## Command Mode

Global Configuration

## Default

10

## Usage

Using for configuring maximal binding number, and default value is 10. The number 0 indicates no limiation

## Examples

The following example shows how to restore the default maximum number of bindings:

```
Switch# configure terminal
Switch(config)# no ip source binding entries
```

The following example shows how to specify the maximum number of bindings:

```
Switch# configure terminal
Switch(config)# ip source maximal binding number per-port 20
```

### Related Commands

show ip source binding

## 11.14.5 ip verify source

### Command Purpose

Use the ip verify source interface configuration command on the switch stack or on a standalone switch to enable IP source guard on an interface. Use the no form of this command to disable IP source guard.

### Command Syntax

ip verify source ( ip | ip-mac | ip-vlan | ip-mac-vlan )

no ip verify source

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ip | Check only IP address | - |
| ip-mac | Check IP address and MAC address | - |
| ip-vlan | Check IP address and VLAN | - |
| ip-mac-vlan | Check IP address, MAC address, and VLAN | - |

### Command Mode

Interface Configuration

### Default

None

### Usage

When IP source guard is enabled on an access port, the ip-mac-vlan keyword is equivalent to the ip-mac keyword.

By default, IP source guard is disabled on interfaces.

## Examples

The following example shows how to enable IP source guard on an interface:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ip verify source ip-mac
```

## Related Commands

ip source binding

show ip source binding

# 11.14.6 show ip source binding

## Command Purpose

Use the show ip source binding privileged EXEC command to display the IP source bindings on the switch.

## Command Syntax

show ip source binding ( interface *IFNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | Display IP source bindings for a specified interface | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

If interface is not specified, all ip-source-binding entries should be shown.

### Examples

The following is sample output from the show ip source binding command:

```
Switch# show ip source binding
The total number of ip binding is 1, the max ip number limit is 127
The total number of ipv6 binding is 0, the max ipv6 number limit is 128
IP source guard binding table:
VLAN MAC Address     Type    Interface      State     IP Address
================================================================================
3    0001.0002.0003 static   eth-0-1     ip          10.0.0.2
```

### Related Commands

ip source binding

no ip source binding

## 11.15 AAA Commands

### 11.15.1 aaa new-model

### Command Purpose

Use this command to enable the authentication, authorization, accounting (AAA) access control model.

Use the no form of this command to disable AAA model

### Command Syntax

aaa new-model

no aaa new-model

### Command Mode

Global Configuration

### Default

None

## Usage

Enables the AAA access control model

## Examples

The following example shows how to enable AAA access control model:

```
Switch# configure terminal
Switch(config)# aaa new-model
```

## Related Commands

show aaa status

# 11.15.2 aaa authentication login

## Command Purpose

Use this command to set authentication, authorization, accounting (AAA) authentication at login.

Use the no form of this command to disable authentication at login

## Command Syntax

aaa authentication login ( default | *LISTNAME* ) { enable | line | none | radius | local | tacacs-plus }

no aaa authentication login ( default | *LISTNAME* )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| default | Default method list | - |
| LISTNAME | An authentication list with this name | String with up to 31 characters |
| enable | Enable password | - |
| line | Line password | - |
| none | No authentication | - |
| radius | RADIUS server | - |
| local | Local username | - |
| tacacs-plus | TACACS+ | - |

### Command Mode

Global Configuration

### Default

None

### Usage

Use the aaa authentication login global configuration command to specify one or more AAA methods for use on ports running IEEE 802.1x.

### Examples

The following example shows how to set authentication at login:

```
Switch# configure terminal
Switch(config)# aaa new-model
Switch(config)# aaa authentication login default local radius none
```

### Related Commands

show aaa method-lists authentication

## 11.15.3 aaa authorization exec

### Command Purpose

Set authentication, authorization, accounting (AAA) authorization at login.

### Command Syntax

aaa authorization exec ( default | *LISTNAME* ) { none | radius | local | tacacs-plus }

no aaa authorization exec ( default | *LISTNAME* )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| default | Default method list | - |
| LISTNAME | An authentication list with this name | String with up to 31 characters |
| none | No authentication | - |

| | | |
|---|---|---|
| radius | RADIUS server | - |
| local | Local username | - |
| tacacs-plus | TACACS+ | - |

### Command Mode

Global Configuration

### Default

None

### Usage

Use the aaa authorization exec global configuration command to specify one or more AAA authorization methods for use on ports running IEEE 802.1x.

### Examples

The following example shows how to set authorization at login:

```
Switch# configure terminal
Switch(config)# aaa new-model
Switch(config)# aaa authorization exec default local radius none
```

### Related Commands

None

## 11.15.4 aaa authorization command

### Command Purpose

Set command set authorization template.

### Command Syntax

aaa authorization command ( default | LISTNAME ) [local | tacacs-plus ]

no aaa authorization command ( default | *LISTNAME* )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| default | Default method list | - |
| LISTNAME | An authorization list with this name | String with up to 31 characters |
| local | Local username | - |
| tacacs-plus | TACACS+ | - |

## Command Mode

Global Configuration

## Default

None

## Usage

Use the aaa authorization command global configuration command to specify the authorization method for the user to execute commands.

## Examples

The following example shows how to set tacacs+ command authorization:

```
Switch# configure terminal
Switch(config)# aaa new-model
Switch(config)# aaa authorization commands fortest tacacs-plus local
```

## Related Commands

None

# 11.15.5 aaa accounting exec

## Command Purpose

Set authentication, authorization, accounting (AAA) accounting at login.

## Command Syntax

aaa accounting exec ( default | *LISTNAME* ) ( ( ( start-stop | stop-only ) { radius | tacacs-plus } ( none | ) ) | none )

no aaa accounting exec ( default | *LISTNAME* )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| default | Default method list | - |
| LISTNAME | An accounting list with this name | String with up to 31 characters |
| start-stop | Send exec accounting start and stop request while logining switch | - |
| stop-only | Only send exec accounting stop request while exit switch | - |
| none | No accounting | - |
| radius | RADIUS server | - |
| tacacs-plus | TACACS+ | - |

## Command Mode

Global Configuration

## Default

None

## Usage

Use the aaa accounting exec global configuration command to specify one or more AAA accounting methods for use on ports running IEEE 802.1x.

## Examples

The following example shows how to set accounting exec:

```
Switch# configure terminal
Switch(config)# aaa new-model
Switch(config)# aaa accounting exec default start-stop tacacs-plus none
```

## Related Commands

None

# 11.15.6 aaa accounting commands

## Command Purpose

Set authentication, authorization, accounting (AAA) accounting at login.

## Command Syntax

aaa accounting commands ( default | *LISTNAME* ) ( ( tacacs-plus ( none | ) ) | none )

no aaa accounting commands ( default | *LISTNAME* )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| default | Default method list | - |
| LISTNAME | An accounting list with this name | String with up to 32 characters |
| none | No accounting | - |
| tacacs-plus | TACACS+ | - |

## Command Mode

Global Configuration

## Default

None

## Usage

Use the aaa accounting commands global configuration command to specify one or more AAA accounting methods for use on ports running IEEE 802.1x.

## Examples

The following example shows how to set accounting commands:

```
Switch# configure terminal
Switch(config)# aaa new-model
Switch(config)# aaa accounting commands default tacacs-plus none
```

### Related Commands

None

## 11.15.7 aaa privilege mapping

### Command Purpose

Set the mapping range in AAA server and switch.

### Command Syntax

aaa privilege mapping *LEVEL1 LEVEL2 LEVEL3*

no aaa privilege mapping

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LEVEL1 | The max server privilege mapping to switch level 1, default 0 | 0-12 |
| LEVEL2 | The max server privilege mapping to switch level 2, default 1 | 1-13 |
| LEVEL3 | The max server privilege mapping to switch level 3, default 10 | 2-14 |

### Command Mode

Global Configuration

### Default

0: The server privilege 0 mapping to switch level 1

1: The server privilege 1 mapping to switch level 2

9: The server privilege 2~9 mapping to switch level 3

Other: The server privilege 10~15 mapping to switch level 4

## Usage

Use the aaa privilege mapping global configuration command to set the mapping range in AAA server and switch.

## Examples

The following example shows how to set accounting commands:

```
Switch# configure terminal
Switch(config)# aaa new-model
Switch(config)# aaa privilege mapping 0 1 14
```

## Related Commands

None

# 11.15.8 login authentication

## Command Purpose

Enable authentication, authorization, accounting (AAA) authentication for logins.

## Command Syntax

login authentication ( default | *LISTNAME* )

no login authentication

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| default | Default method list | - |
| LISTNAME | An authentication list with this name | String with up to 31 characters |

## Command Mode

Line Configuration

## Default

None

## Usage

None

## Examples

The following example shows how to enable authentication for logins:

```
Switch# configure terminal
Switch(config)# line vty 0 7
Switch(config-line)# login authentication default
```

## Related Commands

show aaa method-lists authentication

# 11.15.9 authorization exec

## Command Purpose

Enable authentication, authorization, accounting (AAA) authorization for logins.

## Command Syntax

authorization exec ( default | *LISTNAME* )

no authorization exec

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| default | Default method list | - |
| LISTNAME | An authorization list with this name | String with up to 31 characters |

## Command Mode

Line Configuration

## Default

None

## Usage

None

## Examples

The following example shows how to enable authorization for logins:

```
Switch# configure terminal
Switch(config)# line vty 0 7
Switch(config-line)# authorization exec default
```

## Related Commands

None

# 11.15.10 authorization command

## Command Purpose

Enable command authorization.

## Command Syntax

authorization command ( default | *LISTNAME* )

no authorization command

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| default | Default method list | - |
| LISTNAME | An authorization list with this name | String with up to 31 characters |

## Command Mode

Line Configuration

## Default

None

## Usage

None

## Examples

The following example shows how to enable authorization for command:

```
Switch# configure terminal
Switch(config)# line vty 0 7
Switch(config-line)# authorization command default
```

## Related Commands

None

# 11.15.11 accounting exec

## Command Purpose

Enable authentication, authorization, accounting (AAA) accounting for logins.

## Command Syntax

accounting exec ( default | *LISTNAME* )

no accounting exec

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| default | Default method list | - |
| LISTNAME | An accounting list with this name | String with up to 31 characters |

## Command Mode

Line Configuration

## Default

None

## Usage

None

## Examples

The following example shows how to enable accounting for logins:

```
Switch# configure terminal
Switch(config)# line vty 0 7
Switch(config-line)# accounting exec default
```

## Related Commands

None

# 11.15.12 accounting commands

## Command Purpose

Enable authentication, authorization, accounting (AAA) accounting for logins.

## Command Syntax

accounting commands ( default | *LISTNAME* )

no accounting commands

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| default | Default method list | - |
| LISTNAME | An accounting list with this name | String with up to 31 characters |

## Command Mode

Line Configuration

## Default

None

## Usage

None

## Examples

The following example shows how to enable accounting for logins:

```
Switch# configure terminal
Switch(config)# line vty 0 7
Switch(config-line)# accounting commands default
```

## Related Commands

None

# 11.15.13 show aaa method-lists authentication

## Command Purpose

Use this command to show authentication, authorization, accounting (AAA) authentication method lists.

## Command Syntax

show aaa method-lists authentication

## Command Mode

Privileged EXEC

## Default

None

## Usage

This command is used to show authentication, authorization, accounting (AAA) authentication method lists.

### Examples

The following example shows how to show authentication method lists:

```
Switch# show aaa method-lists authentication
authen queue = AAA_ML_AUTHEN_LOGIN
    name = default  state = ALIVE :   radius
authen queue = AAA_ML_AUTHEN_LOGIN
    name = group_a  state = ALIVE :   radius  local  line  enable  none
authen queue=AAA ML AUTHEN LOGIN
    name = group_b  state = ALIVE :   local  line  none
```

### Related Commands

aaa authentication login

## 11.15.14 show aaa status

### Command Purpose

Use this command to show authentication, authorization, accounting (AAA) status.

### Command Syntax

show aaa status

### Command Mode

Privileged EXEC

### Default

None

### Usage

This command is used to show authentication, authorization, accounting (AAA) status.

### Examples

The following example shows how to show authentication, authorization, accounting status:

```
Switch# show aaa status
aaa stats:
     Authentication enable
```

### Related Commands

aaa new-model

## 11.15.15 show aaa privilege mapping

### Command Purpose

Use this command to show privilege mapping relationship with server privilege.

### Command Syntax

show aaa privilege mapping

### Command Mode

Privileged EXEC

### Default

None

### Usage

This command is to show privilege mapping relationship with server privilege.

### Examples

The following example shows how to show authentication method lists:

```
Switch# show aaa privilege mapping
    Server     Switch     Server
=====================================
```

| | | |
|---|---|---|
| 0 | 1 | 0 |
| 1 | 2 | 1 |
| 2~10 | 3 | 10 |
| 11~15 | 4 | 15 |

### Related Commands

aaa privilege mapping

## 11.15.16 login-security enable

### Command Purpose

Use this command to enable or disable login security function.Use the no form of this command to disable login-security function.Use the no form of this command to recover to default value.

### Command Syntax

login-security enable

no login-security enable

### Command Mode

Global Configuration

### Default

Enable

### Usage

When disable login-secuirty function, all users record will be reset, that is, to clear fail counts of users in unlocked state and unlock users in locked state.

### Examples

The following example shows how to enable login-security function:

```
Switch# configure terminal
Switch(config)# login-security enable
```

The following example shows how to disable login-security function:

```
Switch# configure terminal
Switch(config)# no login-security enable
```

### Related Commands

None

## 11.15.17 login-security max-fail-num

### Command Purpose

Use this command to configure login security lock parameters of max fail times and lock statistic time.Use the no form of this command to recover it to default value.

### Command Syntax

login-security max-fail-num *MAX_FAIL_NUM PERIOD*

no login-security max-fail-num

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MAX_FAIL_NUM | Maximum number of login failure | 1-10 |
| PERIOD | Login failure record period | 1-120,uint is minute |

### Command Mode

Global Configuration

### Default

The default Maximum number of login failure is 5

The default login failure record period is 5 minutes

### Usage

None

## Examples

The following example shows how to configure maximum number of login failure and failure record period in login-security:

```
Switch# configure terminal
Switch(config)# login-security max-fail-num 7 9
```

The following example shows how to recover maximum number of login failure and failure record period to default value:

```
Switch# configure terminal
Switch(config)# no login-security max-fail-num
```

## Related Commands

None

# 11.15.18 login-security lock-duration

## Command Purpose

Use this command to confugure lock duration of login-security.Use the no form of this command to recover it to default value.

## Command Syntax

login-security lock-duration *LOCK_PEROID*

no login-security lock-duration

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LOCK_PEROID | Lock duration | 0-1000,uint is minute |

## Command Mode

Global Configuration

## Default

5

### Usage

Duration during which a user is locked, 0 means forever

### Examples

The following example shows how to configure lock duration:

```
Switch# configure terminal
Switch(config)#login-security lock-duration
```

The following example shows how to recover lock duration to default value:

```
Switch# configure terminal
Switch(config)# no login-security lock-duration
```

### Related Commands

None

## 11.15.19 show login-security

### Command Purpose

Use this command to show records of users which failed to login before.

### Command Syntax

show login-security

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

## Examples

The following example shows how to display information of login-security and login failure records:

```
Switch# show login-security
Switch# show login-security
 Login Security:             Enable
 Max Fail Number:            5
 Fail Period:                5 min
 Lock Duration:              5 min

Login Security Records:
User name                        Local   Locked    Resume Time(s)   Fail Count
================================================================================
admin                            1       0         0                1
abcdefg                          0       1         295              0
```

## Related Commands

None

# 11.15.20 clear login-security record

## Command Purpose

Use this command to clear users' failure records or unlock users in locked state.

## Command Syntax

clear login-security record ( *USERNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| USERNAME | username | the first character should be a-z or A-Z , can only include 0-9A-Za-z.-_ and the max len is 31 |

## Command Mode

Privileged EXEC

## Default

None

### Usage

If specify no username, clear all records. If a username is specified, clear the record for this username.

### Examples

The following example shows how to clear login failure records:

```
Switch#  clear login-security record admin1
```

### Related Commands

None

## 11.16 RADIUS Authentication Commands

### 11.16.1 radius-server deadtime

### Command Purpose

To improve RADIUS response times when some servers might be unavailable and cause the unavailable servers to be skipped immediately, use the radius-server deadtime command in global configuration mode. To set dead-time to default value, use the no form of this command.

### Command Syntax

radius-server deadtime *MINUTES*

no radius-server deadtime

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MINUTES | Length of time, in minutes, for which a RADIUS server is skipped over by transaction requests | 1-20 minutes |

### Command Mode

Global Configuration

### Default

5 minutes

### Usage

Use this command to cause the switch to mark as "dead" any RADIUS servers that fail to respond to authentication requests, thus avoiding the wait for the request to time out before trying the next configured server. A RADIUS server marked as "dead" is skipped by additional requests for the duration of minutes, unless there are no servers not marked "dead".

The default value of the radius deadtime is 5 minutes.

### Examples

The following is sample output from the radius deadtime command:

```
Switch# configure terminal
Switch(config)# radius deadtime 10
```

### Related Commands

radius-server host

## 11.16.2 radius-server host

### Command Purpose

To specify a RADIUS server host, use the radius-server host command in global configuration mode. To delete the specified RADIUS host, use the no form of this command.

### Command Syntax

radius-server host *HOST_IP_ADDR* ( source-interface *IFNAME* | source-ip *SRC_IP_ADDR* | )

radius-server host *HOST_IP_ADDR* { key ( 8 | secret | ) *STRING* | retransmit *RETRIES* | timeout *SEC* | mgmt-if *IPV4_ADDR* | auth-port *AUTH_PORT* | acct-port *ACCT_PORT* } ( source-interface *IFNAME* | source-ip *SRC_IP_ADDR* | )

radius-server host mgmt-if *IPV4_ADDR*

radius-server host mgmt-if *IPV4_ADDR* { key ( 8 | secret | ) *STRING* | retransmit *RETRIES* | timeout *SEC* | mgmt-if *IPV4_ADDRauth-port AUTH_PORT* }

no radius-server host ( mgmt-if | ) *IPV4_ADDR* ( mgmt-if *IPV4_ADDRauth-port AUTH_PORT* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| mgmt-if | Management port | - |
| IPV4_ADDR | IPv4 address of the RADIUS server host | IPv4 Address |
| IPV6_ADDR | IPv6 address of the RADIUS server host | - |
| AUTH_PORT | (Optional) Port number for authentication requests; the host is not used for authentication if set to 0. If unspecified, the port number defaults to 1812 | 1-65535 |
| ACCT_PORT | (Optional) Port number for accounting requests; the host is not used for accounting if set to 0. If unspecified, the port number defaults to 1813 | 1-65535 |
| SECONDS | (Optional) Specifies the timeout value.If no timeout value is specified, the global value is used. The default value should be 5 | 1-1000 seconds |
| RETRIES | (Optional) Specifies the retransmit value. If no retransmit value is specified, the global value is used. The default value should be 3 | 1-100 |
| STRING | (Optional) Specifies the authentication and encryption key for all RADIUS communications between the switch and the RADIUS server. This key must match the encryption used on the RADIUS daemon | Up to 256 characters |

| | | |
|---|---|---|
| IFNAME | Name of source interface | Support physical/aggregation/loopback/vlan/tunnel ports |
| SRC_IP_ADDR | Source IP address | IPv4 Address |

## Command Mode

Global Configuration

## Default

None

## Usage

You can use multiple radius-server host commands to specify multiple hosts. The software searches for hosts in the order in which you specify them.

If no host-specific timeout, retransmit, or key values are specified, the global values apply to each host.

If the source interface or source IP address is specified, the packet transmit will use the related IP address as source address.

## Examples

The following is sample output from the radius-server host command:

```
Switch# configure terminal
Switch(config)# radius-server host 10.10.1.1 key abcde
```

## Related Commands

radius-server key

radius-server timeout

## 11.16.3 radius-server retransmit

### Command Purpose

To specify the number of times the switch searches the list of RADIUS server hosts before giving up, use the radius-server retransmit command in global configuration mode. To disable retransmission, use the no form of this command.

### Command Syntax

radius-server retransmit *RETRIES*

no radius-server retransmit

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| RETRIES | Maximum number of retransmission attempts.The default is 3 | 1-100 |

### Command Mode

Global Configuration

### Default

3 attempts

### Usage

The switch tries all servers, allowing each one to time out before increasing the retransmit count.

If the RADIUS server is only a few hops from the switch, we recommend that you configure the RADIUS server retransmit rate to 5.

The default value of radius retransmit is 3 attempts.

### Examples

The following is sample output from the radius retransmit command:

```
Switch# configure terminal
Switch(config)# radius retransmit 5
```

### Related Commands

radius-server host

radius-server key

## 11.16.4 radius-server timeout

### Command Purpose

To set the interval for which a switch waits for a server host to reply, use the radius-server timeout command in global configuration mode. To restore the default, use the no form of this command.

### Command Syntax

radius-server timeout *SECONDS*

no radius-server timeout

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SECONDS | Number that specifies the timeout interval, in seconds. The default is 5 seconds. | 1-1000 seconds |

### Command Mode

Global Configuration

### Default

None

### Usage

Use this command to set the number of seconds a switch waits for a server host to reply before timing out.

If the RADIUS server is only a few hops from the switch, we recommend that you configure the RADIUS server timeout to 15 seconds.

The default value of radius timeout is 5 seconds.

## Examples

The following is sample output from the radius timeout command:

```
Switch# configure terminal
Switch(config)# radius retransmit 15
```

## Related Commands

radius-server host

radius-server key

# 11.16.5 radius-server key

## Command Purpose

To set the shared encryption key of RADIUS server, use the radius-server key command in global configuration mode. To restore the default, use the no form of this command.

## Command Syntax

radius-server key *KEY_STRING*

no radius-server key

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| KEY_STRING | RADIUS server key-string | - |

## Command Mode

Global Configuration

## Default

None

## Usage

Use this command to set the shared encryption key in a switch.

Shared encryption key is the foundation of communicate between switch and server. You need set a same shared encryption string in authentication server and switch.

## Examples

The following is sample output from the radius-server key command:

```
Switch# configure terminal
Switch(config)# radius-server key simple-key
```

## Related Commands

radius-server host

# 11.16.6 radius-server radsec host

## Command Purpose

Use this command to add a RADSEC server, and the switch will encrypt the Radius messages using TLS to enhance security. Use the 'no' form of this command to delete the configuration.

## Command Syntax

radius-server radsec host (mgmt-if | ) A.B.C.D {key (8|secret| ) STRING| retransmit RETRIES| timeout SEC}

no radius-server radsec host (mgmt-if | ) A.B.C.D

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| A.B.C.D | IPv4 address of RADIUS Server | - |
| STRING | The shared key used when the switch interacts with the Radius Server | - |
| RETRIES | Number of message retransmissions | <1-100>，default：3 |

| | | |
|---|---|---|
| SEC | timeout period | <1-1000>，default：5 seconds。 |

## Command Mode

Global Configuration

## Default

Disable

## Usage

Use this command to add a RADSEC server, and the switch will use Transport Layer Security (TLS) over TCP as the transport protocol when communicating with the configured RADSEC server, providing secure transmission of authentication and billing data over untrusted networks.

## Examples

Configure the switch to use RADSEC to communication with Radius Server 10.10.1.1.

```
Switch(config)# radius-server radsec host 10.10.1.1 key Radsec5600
```

## Related Commands

None

# 11.16.7 radius-server algorithm load-balance

## Command Purpose

Use this command to configure the radius server load balancing algorithm.

## Command Syntax

radius-server algorithm load-ballance (default | mac-hash-swrr | rr | strict-mac-sticky-swrr | swrr)

## Command Mode

Global Configuration

## Default

Disable

## Usage

Use this command to configure the load balancing algorithm for the radius server. In default mode, the switch selects the first available Radius Server.

mac-hash-swrr: Smooth Weighted Polling Algorithm for MAC Address Hash;

rr: round-robin algorithm;

strict-mac-sticky-swrr: a strict MAC address sticky smooth weighted round-robin algorithm;

swrr: smooth Weighted round-robin Algorithm.

## Examples

Configure the switch to enable the load balancing function of the Radius Server and use the mac-hash-swrr algorithm.

```
Switch(config)# radius-server algorithm load-balance mac-hash-swrr
```

## Related Commands

None

# 11.16.8 radius-server weight

## Command Purpose

Use this command to configure the weights for the radius server load balancing algorithm. Use the 'no' form of this command to restore to default values.

## Command Syntax

radius-server host <A.B.C.D> weight <VALUE>

no radius-server host <A.B.C.D> weight

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| A.B.C.D | IPv4 address RADIUS Server | - |
| VALUE | Weight of RADIUS Server | <1-10>，default：1 |

## Command Mode

Global Configuration

## Default

1.

## Usage

Use this command to configure the weight of the load balancing algorithm for the radius server. This parameter will affect the probability of the radius server being ultimately selected.

## Examples

Configure the weight of the Radius Server to be 5.

```
Switch(config)# radius-server host 10.10.1.1 weight 5
```

## Related Commands

show dot1x radius-server

# 11.16.9 show dot1x radius-server

## Command Purpose

Use this command to display the current server load balancing algorithm, the configuration weights of each server, and the number of times it has been selected.

## Command Syntax

show dot1x radius-server

## Command Mode

Privileged EXEC

## Default

None

## Usage

Use this command to view the current server load balancing algorithm, the configuration weights of each server, and the number of times it has been selected.

## Examples

display the current server load balancing algorithm, the configuration weights of each server, and the number of times it has been selected.

```
Switch# show dot1x radius-server
Load balance algorithm   : strict-mac-sticy-swrr
Total weight             : 15
rr_index                 : -1

Server                                  Weight Current-weight  Status    Count
-------------------------------------------------------------------------------
172.16.7.64                             3      0               UP        0
172.16.254.88                           10     0               UP        0
172.16.2.97                             1      0               UP        0
172.16.4.1                              1      0               UP        0
```

```
Switch#
```

### Related Commands

radius-server weight

radius-server algorithm load-balance

## 11.16.10 show dot1x radius-server status

### Command Purpose

Use the “show radius-server” command to display radius server states of each IEEE 802.1x session.

### Command Syntax

show dot1x radius-server status ( interface *IFNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | Specify an interface to show | Support Physical ports |

### Command Mode

Privileged EXEC

### Default

None

### Usage

Use this command to display the current radius-server and dead radius-servers of each IEEE 802.1 x sessions.

### Examples

The following is sample output from the show radius-server command:

```
Switch# show dot1x radius-server status
====================================
```

```
802.1X session on interface eth-0-9:
current radius server:
 retransmit count  : 3
 server address    : 3.3.3.3:1812
 socket descriptor : 15
 last state        :
radius servers in dead list:
 N/A
====================================
```

### Related Commands

radius-server host

## 11.16.11 show radius-server

### Command Purpose

Use the “show radius-server” command to display radius server states of each IEEE 802.1x session.

### Command Syntax

show radius-server

### Command Mode

Privileged EXEC

### Default

None

### Usage

Use this command to display the current radius-server and dead radius-servers of each IEEE 802.1 x sessions.

### Examples

The following is sample output from the show radius-server command:

```
Switch# show radius-server
====================================
802.1X session on interface eth-0-9:
current radius server:
 retransmit count  : 3
 server address    : 3.3.3.3:1812
 socket descriptor : 15
 last state        :
radius servers in dead list:
 N/A
====================================
```

### Related Commands

radius-server host

## 11.17 Tacacs+ Commands

### 11.17.1 tacacs-server host

### Command Purpose

Specifies and defines the IP address of the TACACS+ server host.

### Command Syntax

tacacs-server host *HOST_IP_ADDR* ( { key ( 8 | secret | ) *STRING* | timeout *SECONDS* | port *PORT* | single-connection | primary } | ) ( source-interface *IFNAME* | source-ip *SRC_IP_ADDR* | )

tacacs-server host mgmt-if *IP_ADDR* ( { key ( 8 | secret | ) *STRING* | timeout *SECONDS* | port *PORT* | single-connection | primary } | )

no tacacs-server host ( mgmt-if | ) *IP_ADDR* ( port *PORT* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| mgmt-if | Management port | - |
| IP_ADDR | TACACS+ server IP address | IPv4 address |
| single-connection | Maintains a single open connection | - |
| primary | TACACS+ primary server | - |
| PORT | TACACS server port number (default 49) | 1-65535 |

| | | |
|---|---|---|
| SECONDS | Time to wait for a TACACS server to reply, the range is 1 to 20, default 5s | 1-20 |
| STRING | Set TACACS+ encryption key | Up to 256 characters |
| 8 | Specifies a hidden password will follow | - |
| secret | Display the current shared key with cipher text | - |
| IFNAME | Name of source interface | Support physical/aggregation/loop back/vlan/tunnel ports |
| SRC_IP_ADDR | Source IP address | IPv4 address |

## Command Mode

Global Configuration

## Default

No Tacacs+ server is configured by default

## Usage

Add or delete a TACACS+ server host.

If the source interface or source IP address is specified, the packet transmit will use the related IP address as source address.

## Examples

The following example shows how to specify a TACACS+ primary server host:

```
Switch# configure terminal
Switch(config)# tacacs-server host 10.10.10.1 port 55 key my_key primary
```

## Related Commands

show tacacs

## 11.17.2 clear tacacs statistics

### Command Purpose

To reset statistics on TACACS+ servers, use the clear tacacs statistics EXEC command.

### Command Syntax

clear tacacs statistics

### Command Mode

Privileged EXEC

### Default

None

### Usage

Reset statistics on TACACS+ servers.

### Examples

The following example shows how to reset statistics on TACACS+ servers:

```
Switch# clear tacacs statistics
```

### Related Commands

show tacacs

## 11.17.3 show tacacs

### Command Purpose

To display statistics for a TACACS+ server, use the show tacacs command in EXEC configuration mode.

## Command Syntax

show tacacs

## Command Mode

Privileged EXEC

## Default

None

## Usage

This command is used to show TACACS+ servers statistics.

## Examples

The following example shows how to show TACACS+ servers:

```
Switch(config)# clear tacacs statistics

Switch# show tacacs
Tacacs+ Primary Server            : 10.10.33.29(mgmt-if) port 49
Tacacs+ Current Server            : 10.10.33.29(mgmt-if) port 49

Tacacs+ Primary Server            : 10.10.33.29(mgmt-if)
Server port               : 49
Socket opens              : 42
Socket closes             : 42
Socket aborts             : 0
Socket errors             : 0
Socket Timeouts           : 0
Failed Connect Attempts   : 3
Total Packets Sent        : 66
Total Packets Recv        : 66
```

## Related Commands

tacacs-server host

## 11.17.4 tacacs-server timeout quiet-time

### Command Purpose

Use this command to configure the silence time for the primary server to restore its active state.

Add the keyword 'no' before the command to restore the configuration to default.

### Command syntax

tacacs-server timeout quiet-time *MINUTES*

no tacacs-server timeout quiet-time

| Parameter | Parameter Description | **Parameter Value** |
|---|---|---|
| MINUTES | the silence time for the primary server to restore its active state | 1-255 |

### Command Mode

Global Configuration

### Default

5minutes

### Usage

When Tacacs+primary server does not respond, set a silent time to ensure that the primary server resumes its active state as soon as possible, while reducing the number of probes during server switching. Default 5 minutes

### Example

Set the time for Tacacs+primary server to restore activation status

```
Switch# configure terminal
Switch(config)# tacacs-server timeout quiet-time 10
```

### Related Commands

tacacs-server host

## 11.18 Port Isolate Commands

### 11.18.1 port-isolate group

#### Command Purpose

Use the port-isolate group interface configuration command on the switch to set the isolate group of a interface.

Use the no form of this command to return to the default setting.

#### Command Syntax

port-isolate group *GROUP*

no port-isolate group

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| GROUP | Port isolate group id | 1-30 |

#### Command Mode

Interface Configuration

#### Default

None

#### Usage

The ports in the same isolate-group can not communicate with each other.

The ports in different isolate-groups should not be affected by this feature.

The isolate-groups can only be configured on physical port and Link Aggregation.

### Examples

The following is sample output from the port-isolate group command:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# port-isolate group 4
```

### Related Commands

port-isolate mode

## 11.18.2 port-isolate mode

### Command Purpose

Use the port-isolate mode global configuration command on the switch to set isolate mode.

Use the no form of this command to return to the default setting.

### Command Syntax

port-isolate mode ( all | l2 )

no port-isolate mode

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| all | Isolate bridged packets and routed packets | - |
| l2 | Isolate bridged packets | - |

### Command Mode

Global Configuration

### Default

None

### Usage

If configure “port-isolate mode l2”, all routed packets should not obey the port isolate rules.

If configure “port-isolate mode all”, all packets should obey the port isolate rules.

The default setting is “l2”

### Examples

The following is sample output from the port-isolate mode command:

```
Switch# configure terminal
Switch(config)# port-isolate mode all
```

### Related Commands

port-isolate group

## 11.18.3 show port-isolate

### Command Purpose

Use the show port-isolate command on the switch to check the port-isolate configuration.

### Command Syntax

show port-isolate ( group *GROUP* )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| GROUP | Port isolate group id | 1-30 |

### Command Mode

Privileged EXEC

### Default

None

## Usage

None

## Examples

The following is sample output from the show port-isolate command:

```
switch # show port-isolate group 12
Port Isolate Mode  : L2
------------------------------------------------------------------
 Port Isolate Groups:
------------------------------------------------------------------
 Groups ID: 12
eth-0-1   eth-0-2   eth-0-3   eth-0-4   eth-0-5
eth-0-6
------------------------------------------------------------------
```

## Related Commands

port-isolate group

# 11.18.4 port-isolate am

## Command Purpose

Use this command to enable unidirectional isolation.

Use the no form of this command to disable it.

## Command Syntax

port-isolate am interface *IFNAME*

port-isolate am interface range *IFRNG*

no port-isolate am interface *IFNAME*

no port-isolate am interface range *IFRNG*

no port-isolate am

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | port name | Support physical/aggregation ports |

| | | |
|---|---|---|
| IFRNG | string to defing port range | Support physical/aggregation ports. Use comma and short bar to describe a range of ports. |

### Command Mode

Interface Configuration

### Default

None

### Usage

Unidirectional isolation can not co-work with isolate group on a same interface.

### Examples

The following example shows how to deny the packet received from eth-0-9 and send to eth-0-10:

```
Switch# configure terminal
Switch(config)# interface eth-0-9
Switch(config-if)# port-isolate am interface eth-0-10
```

### Related Commands

show port-isolate

## 11.19 Private Vlan Commands

### 11.19.1 switchport mode private-vlan

### Command Purpose

To configure the switch port's mode as private vlan, use the "switchport mode private-vlan" command in interface mode.

## Command Syntax

switchport mode private-vlan ( host | promiscuous )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| host | Set the port as private vlan, host port | - |
| promiscuous | Set the port as private vlan, promiscuous port | - |

## Command Mode

Interface Configuration

## Default

By default the switch port's mode is access vlan.

## Usage

To configure the switch port's mode as private vlan, use the "switchport mode private-vlan" command in interface mode.

This can only be configured on a switchport.

## Examples

The following example shows how to configure the switch port mode:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# switchport mode private-vlan host
Switch(config-if)# switchport mode private-vlan promiscuous
```

## Related Commands

switchport private-vlan

## 11.19.2 switchport private-vlan

### Command Purpose

To configure the primary and secondary vlan of a private vlan, use the “switchport private-vlan” command in interface mode.

Use the “no” form of this command to restore the default value.

### Command Syntax

switchport private-vlan *VLAN_ID* ( isolate | community-vlan *VLAN_ID* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| private-vlan VLAN_ID | Set private primary vlan | 1-4094 |
| isolate | Set as isolate mode | - |
| community-vlan VLAN_ID | Set communtiy vlan | 1-4094 |

### Command Mode

Interface Configuration

### Default

By default, the primary vlan is 1.

If the switchport mode is private-vlan host, the default mode is isolate; Or else the switchport mode is promiscuous

### Usage

To configure the primary and secondary vlan of a private vlan, use the “switchport private-vlan” command in interface mode.

This can only be configured on a switchport.

### Examples

The following example shows how to configure the private vlan:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
```

```
Switch(config-if)# switchport mode private-vlan host
Switch(config-if)# switchport private-vlan 1 isolate
Switch(config-if)# quit
Switch(config)# interface eth-0-2
Switch(config-if)# switchport mode private-vlan host
Switch(config-if)# switchport private-vlan 1 community-vlan 2
Switch(config-if)# quit
Switch(config)# interface eth-0-3
Switch(config-if)# switchport mode private-vlan promiscuous
Switch(config-if)# switchport private-vlan 1
```

### Related Commands

switchport mode private-vlan

## 11.19.3 show private-vlan

### Command Purpose

To display the private-vlan configure, use the show private-vlan command in privileged Privileged EXEC.

### Command Syntax

show private-vlan ( vlan *VLAN_ID* | interface *IFNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Show by primary vlan | 1-4094 |
| IFNAME | Show by interface | Support physical/aggregation ports |

### Command Mode

Privileged EXEC

### Default

N/A

### Usage

None

### Examples

The following example shows the result of this command:

```
Switch# show private-vlan
Primary   Secondary Type           Ports
------------------------------------------------------------------------------
1         N/A       promiscuous    eth-0-3
1         N/A       isloate        eth-0-1
1         2         community      eth-0-2
DUT1# show private-vlan vlan 1
Primary   Secondary Type           Ports
------------------------------------------------------------------------------
1         N/A       promiscuous    eth-0-3
1         N/A       isloate        eth-0-1
1         2         community      eth-0-2
DUT1# show private-vlan interface eth-0-1
------------------------------------------------------------------------------
 Private vlan mode: isolate
 Primary vlan id  : 1
```

### Related Commands

switchport mode private-vlan

switchport private-vlan

## 11.20 DDOS Commands

### 11.20.1 ip icmp intercept

### Command Purpose

To configure the system to resist ICMP flood attack, use the ip icmp intercept command in global configuration mode. To disable this capability, use the no form of this command.

### Command Syntax

ip icmp intercept ( maxcount *NUMBER* | )

no ip icmp intercept

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NUMBER | Specify max counter of received packets per second | 0-1000 |

## Command Mode

Global Configuration

## Default

By default, ip icmp intercept is unset.

If the maxcount is not specified , the default count is 500.

## Usage

Use this command if you want to set the system to limit the ICMP packet rate.

## Examples

The following example shows how to configure the ip icmp intercept:

```
Switch# configure terminal
Switch(config)# ip icmp intercept maxcount 100
```

The following example unset the ip icmp intercept:

```
Switch# configure terminal
Switch(config)# no ip icmp intercept
```

## Related Commands

show ip-intercept config

# 11.20.2 ip smurf intercept

## Command Purpose

To configure the system to resist smurf attack, use the ip smurf intercept command in global configuration mode. To disable this capability, use the no form of this command.

### Command Syntax

ip smurf intercept

no ip smurf intercept

### Command Mode

Global Configuration

### Default

By default, ip smurf intercept is set.

### Usage

Use this command if you want to set the system to resist smurf attack.

### Examples

The following example shows how to configure the ip sumrf intercept:

```
Switch# configure terminal
Switch(config)# ip smurf intercept
```

The following example unset the ip smurf intercept::

```
Switch# configure terminal
Switch(config)# no ip smurf intercept
```

### Related Commands

show ip-intercept config

## 11.20.3 ip fraggle intercept

### Command Purpose

To configure the system to resist fraggle attack, use the ip fraggle intercept command in global configuration mode. To disable this capability, use the no form of this command.

### Command Syntax

ip fraggle intercept

no ip fraggle intercept

### Command Mode

Global Configuration

### Default

By default, ip fraggle intercept is unset.

### Usage

Use this command if you want to set the system to resist fraggle attack.

### Examples

The following example shows how to configure the ip fraggle intercept:

```
Switch# configure terminal
Switch(config)# ip fraggle intercept
```

The following example unset the ip fraggle intercept:

```
Switch# configure terminal
Switch(config)# no ip fraggle intercept
```

### Related Commands

show ip-intercept config

## 11.20.4 ip udp intercept

### Command Purpose

To configure the system to resist UDP flood attack, use the ip udp intercept command in global configuration mode. To disable this capability, use the no form of this command.

## Command Syntax

ip udp intercept ( maxcount *NUMBER* | )

no ip udp intercept

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NUMBER | Specify max counter of received packets per second | 0-1000 |

## Command Mode

Global Configuration

## Default

By default, ip udp intercept is unset.

If the maxcount is not specified , the default count is 500.

## Usage

Use this command if you want to set the system to limit the UDP packet rate.

## Examples

The following example shows how to configure the ip udp intercept:

```
Switch# configure terminal
Switch(config)# ip udp intercept maxcount 100
```

The following example unset the ip udp intercept:

```
Switch# configure terminal
Switch(config)# no ip udp intercept
```

## Related Commands

show ip-intercept config

## 11.20.5 ip tcp intercept

### Command Purpose

To configure the system to resist SYN flood attack, use the ip tcp intercept command in global configuration mode. To disable this capability, use the no form of this command.

### Command Syntax

ip tcp intercept ( maxcount number | )

no ip tcp intercept

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NUMBER | Specify max counter of received packets per second | 0-1000 |

### Command Mode

Global Configuration

### Default

By default, ip tcp intercept is unset.

If the maxcount is not specified , the default count is 500.

### Usage

Use this command if you want to set the system to limit the TCP packet rate with only SYN bit set.

### Examples

The following example shows how to configure the ip tcp intercept:

```
Switch# configure terminal
Switch(config)# ip tcp intercept maxcount 100
```

The following example unset the ip tcp intercept:

```
Switch# configure terminal
Switch(config)# no ip tcp intercept
```

### Related Commands

show ip-intercept config

## 11.20.6 ip small-packet intercept

### Command Purpose

To configure the system to filter the small packet, use the ip small-packet command in global configuration mode. To disable this capability, use the no form of this command.

### Command Syntax

ip small-packet intercept ( length number | )

no ip small-packet intercept

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NUMBER | Specify length of small packet | 28-65535 |

### Command Mode

Global Configuration

### Default

By default, ip small-packet intercept is unset.

If the length is not specified , the default value is 28 bytes.

### Usage

Use this command if you want to set the system to drop the packet which length is less than the configured value.

### Examples

The following example configures the ip small-packet intercept:

```
Switch# configure terminal
Switch(config)# ip small-packet intercept length 32
```

The following example unset the ip small-packet intercept:

```
Switch# configure terminal
Switch(config)# no small-packet intercept
```

### Related Commands

show ip-intercept config

## 11.20.7 ip maceq intercept

### Command Purpose

To configure the system to intercept the packet whose source MAC equals to destination MAC, use the ip maceq intercept command in global configuration mode. To disable this capability, use the no form of this command.

### Command Syntax

ip maceq intercept

no ip maceq intercept

### Command Mode

Global Configuration

### Default

By default, ip mac equal intercept is unset.

### Usage

Use this command if you want to set the system to drop the packet whose source MAC equals to destination MAC.

### Examples

The following example configures the ip intercept mac equals:

```
Switch# configure terminal
Switch(config)# ip maceq intercept
```

The following example unset the ip intercept mac equals:

```
Switch# configure terminal
Switch(config)# no ip maceq intercept
```

### Related Commands

show ip-intercept config

## 11.20.8 ip ipeq intercept

### Command Purpose

To configure the system to intercept the packet whose source IP address equals to destination IP address, use the ip ipeq intercept command in global configuration mode. To disable this capability, use the no form of this command.

### Command Syntax

ip ipeq intercept

no ip ipeq intercept

### Command Mode

Global Configuration

### Default

By default, ip ip equal intercept is unset.

### Usage

Use this command if you want to set the system to drop the packet whose source IP address equals to destination IP address.

### Examples

The following example configures the ip intercept ip equal:

```
Switch# configure terminal
Switch(config)# ip ipeq intercept
```

The following example unset the ip intercept ip equal:

```
Switch# configure terminal
Switch(config)# no ip ipeq intercept
```

### Related Commands

show ip-intercept config

## 11.20.9 show ip-intercept config

### Command Purpose

To display the ip intercept configurations, use the show ip-intercept config command in privileged Privileged EXEC.

### Command Syntax

show ip-intercept config

### Command Mode

Privileged EXEC

### Default

None

### Usage

Use this command to display ip intercept configurations.

### Examples

The following example shows the configuration of ip intercept:

```
Switch# show ip-intercept config
Current DDoS Prevent configuration:
============================================================
ICMP Flood Intercept             :Enable  Maxconut:100
UDP Flood Intercept              :Enable  Maxconut:100
SYN Flood Intercept              :Enable  Maxconut:100
Small-packet Attack Intercept    :Enable  Packet Length:32
Sumrf Attack Intercept           :Enable
Fraggle Attack Intercept         :Enable
MAC Equal Intercept              :Disable
IP Equal Intercept               :Disable
```

### Related Commands

show ip-intercept config

## 11.20.10 show ip-intercept statistics

### Command Purpose

To display the statistics of the intercept packets, use the show ip-intercept statistics command in privileged Privileged EXEC.

### Command Syntax

show ip-intercept statistics

### Command Mode

Privileged EXEC

### Default

None

### Usage

Use this command to display ip intercept statistics.

### Examples

The following is sample output from the show ip-intercept statistics command:

```
Switch# show ip-intercept statistics
Current DDoS Prevent statistics:
============================================================
Resist Small-packet Attack packets number    :  17307
Resist ICMP Flood packets number             :  0
Resist SYN Flood packets number              :  0
Resist Fraggle Attack packets number         :  0
Resist UDP Flood packets number              :  0

Current DDoS Prevent mgmt-if statistics:
============================================================
Resist ICMP Flood packets number             :  0
Resist SYN Flood packets number              :  0
Resist Fraggle Attack packets number         :  0
Resist UDP Flood packets number              :  0
```

### Related Commands

clear ip-intercept statistics

## 11.20.11 clear ip-intercept statistics

### Command Purpose

To clear the statistics of the intercept packets, use the clear ip-intercept statistics command in privileged Privileged EXEC.

### Command Syntax

clear ip-intercept statistics

### Command Mode

Privileged EXEC

### Default

None

### Usage

Use this command to clear ip intercept statistics.

### Examples

The following example displays how to use clear ip-intercept statistics command:

```
Switch# clear ip-intercept statistics
Switch# show ip-intercept statistics
Current DDoS Prevent statistics:
============================================================
Resist Small-packet Attack packets number    :  0
Resist ICMP Flood packets number             :  0
Resist SYN Flood packets number              :  0
Resist Fraggle Attack packets number         :  0
Resist UDP Flood packets number              :  0

Current DDoS Prevent mgmt-if statistics:
============================================================
Resist ICMP Flood packets number             :  0
Resist SYN Flood packets number              :  0
Resist Fraggle Attack packets number         :  0
Resist UDP Flood packets number              :  0
```

### Related Commands

show ip-intercept statistics

## 11.21 Key Chain Commands

### 11.21.1 key chain

### Command Purpose

To create a keychain, use the key chain command in global configuration mode. To delete a keychain, use the no form of this command.

### Command Syntax

key chain *WORD*

no key chain *WORD*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| WORD | The name of keychain | String with up to 20 characters |

### Command Mode

Global Configuration

### Default

No keychain is created.

### Usage

Routing protocols and network management applications often use keychain to enhance security while communicating with peers. For the detail of these configurations, see relevant chapters of user guide.

### Examples

The following example shows how to create a keychain:

```
Switch# configure terminal
Switch(config)# key chain test
Switch(config-keychain)#
```

### Related Commands

key

key-string

show key chain

## 11.21.2 key

### Command Purpose

To create a key in a keychain, use the key command in keychain configuration mode. To delete a key from a keychain, use the no form of this command.

### Command Syntax

key *KEY_ID*

no key *KEY_ID*

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| KEY_ID | key id | 0-31 |

## Command Mode

Key Chain Configuration

## Default

There is no key in a keychain.

## Usage

The key will not be used unless key string was configured.

## Examples

The following example shows how to create a key:

```
Switch# configure terminal
Switch(config)# key chain test
Switch(config-keychain)# key 1
```

## Related Commands

key chain

key-string

accept-lifetime

send-lifetime

# 11.21.3 key-string

## Command Purpose

To configure key string for a key, use key-string command in key configuration mode. To delete configuration, use the no form of this command.

## Command Syntax

key-string *LINE*

no key-string *LINE*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LINE | Key string | String with up to 255 characters |

## Command Mode

Key Configuration

## Default

The key string is not be configured.

## Usage

This command is used to configure key string for a key and then this key will be valid for ever if there is no lifetime set.

## Examples

The following example shows how to configure key-string:

```
Switch# configure terminal
Switch(config)# key chain test
Switch(config-keychain)# key 2
Switch(config-keychain-key)# key-string ##test_keywords##
```

## Related Commands

key

accept-lifetime

send-lifetime

## 11.21.4 accept-lifetime

### Command Purpose

To configure the accept lifetime for a key, use accept-lifetime command in key configuration mode. To delete this configuration, use the no form of this command.

### Command Syntax

accept-lifetime *START-TIME EXPIRE-TIME*

no accept-lifetime

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| START-TIME | The start of accept lifetime | The start of accept lifetime,its format should like “HH:MM:SS <1-31> MONTH <1993-2035>” or “HH:MM:SS MONTH <1-31> <1993-2035>” and MONTH should be First three letters of the month |
| EXPIRE-TIME | The end of accept lifetime | The end of accept lifetime,its format should like “HH:MM:SS <1-31> MONTH <1993-2035>”, “HH:MM:SS MONTH <1-31> <1993-2035>”, “Infinite” or “duration <1-2147483646>” and MONTH should be First three letters of the month |

### Command Mode

Key Configuration

### Default

No accept lifetime is configured

### Usage

This command is used to configure accept lifetime for a key which will be invalid after lifetime expired.

### Examples

The following example shows how to configure accept-lifetime:

```
Switch# configure terminal
Switch(config)# key chain test
Switch(config-keychain)# key 2
Switch(config-keychain-key)# accept-lifetime 0:0:1 2 jan 2012 infinite
```

### Related Commands

key

key-string

## 11.21.5 send-lifetime

### Command Purpose

To configure the send lifetime for a key, use send-lifetime command in key configuration mode. To delete this configuration, use the no form of this command.

### Command Syntax

send-lifetime *START-TIME EXPIRE-TIME*

no send-lifetime

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| START-TIME | The start of send lifetime | The start of send lifetime,its format should like "HH:MM:SS <1-31> MONTH <1993-2035>" or "HH:MM:SS MONTH <1-31> <1993-2035>" and MONTH should be First three letters of the month |
| EXPIRE-TIME | The end of send lifetime | The end of send lifetime,its format should like "HH:MM:SS <1-31> MONTH <1993-2035>", "HH:MM:SS MONTH <1-31> <1993-2035>", "Infinite" or "duration <1-2147483646>" and MONTH should be First three letters of the month |

## Command Mode

Key Configuration

## Default

No send lifetime is configured

## Usage

This command is used to configure send lifetime for a key which will be invalid after lifetime expired.

## Examples

The following example shows how to configure send-lifetime:

```
Switch# configure terminal
Switch(config)# key chain test
Switch(config-keychain)# key 2
Switch(config-keychain-key)# send-lifetime 0:0:1 2 jan 2012 infinite
```

## Related Commands

key

key-string

# 11.21.6 show key chain

## Command Purpose

To show information of keychain, use show key chain command.

## Command Syntax

show key chain ( *WORD* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| WORD | The name of keychain | String with up to 20 characters |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following example shows how to display keychain:

```
Switch# show key chain test
key chain test:
    key 1 -- text "key-string ##test_keywords_1##"
      accept-lifetime <00:00:01 Jan 01 2012> - <infinite>
      send-lifetime <always valid> - <always valid> [valid now]
    key 2 -- text "key-string ##test_keywords_2##"
      accept-lifetime <always valid> - <always valid> [valid now]
      send-lifetime <00:00:01 Jan 02 2012> - <infinite>
```

### Related Commands

key chain

## 11.22 Port-block Commands

### 11.22.1 port-block

### Command Purpose

To configure port block, use the port-block command in interface configuration mode. To delete this configuration, use the no form of this command.

### Command Syntax

port-block ( known-unicast | known-multicast | unknown-unicast | unknown-multicast | broadcast )

no port-block ( known-unicast | known-multicast | unknown-unicast | unknown-multicast | broadcast )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| known-unicast | Specify that known unicast traffic should be blocked | - |
| known-multicast | Specify that known multicast traffic should be blocked | - |
| unknown-unicast | Specify that unknown unicast traffic should be blocked | - |
| unknown-multicast | Specify that unknown multicast traffic should be blocked | - |
| broadcast | Specify that broadcast traffic should be blocked | - |

## Command Mode

Interface Configuration

## Default

Unknown or known multicast and unicast traffic is not blocked.

Broadcast traffic is not blocked.

## Usage

By default, all traffic with unknown MAC addresses is sent to all ports. You can block unknown multicast or unicast traffic on protected or non protected ports. If unknown multicast or unicast traffic is not blocked on a protected port, there could be security issues.

With multicast traffic, the port blocking feature blocks only pure Layer 2 packets. Multicast packets that contain IPv4 or IPv6 information in the header are not blocked.

## Examples

This example shows how to block unknown multicast traffic on an interface:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# port-block known-unicast
```

### Related Commands

show port-block (interface IFPHYSICAL | interface IFAGG |)

## 11.22.2 show port-block

### Command Purpose

Use this command to display the port-block configuration.

### Command Syntax

show port-block ( interface *IFNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | Specify the interface | Support physical/aggregation ports |

### Command Mode

Privileged EXEC

### Default

N/A

### Usage

If the interface is not specified, all interfaces should be displayed.

### Examples

This example shows how to show port-block configuration in Privileged Privileged EXEC:

```
Switch# show port-block interface eth-0-1
```

### Related Commands

port-block (known-unicast | known-multicast | unknown-unicast | unknown-multicast | broadcast)

# 11.23 Device management securiy Commands

## 11.23.1 ip telnet server acl

### Command Purpose

To deny specified telnet client IP, use this command in configuration mode. To delete this configuration, use the no form of this command.

### Command Syntax

ip telnet server acl *NAME*

no ip telnet server acl

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | access-list name | String with up to 40 characters |

### Command Mode

Global Configuration

### Default

No acl is specified

### Usage

Use this command to deny specified telnet client IP.

The access-list should be created before using this command.

ACEs witch non-contiguous subnet masks are not supported for configuration

### Examples

This example shows how to enabe telnet acl, which deny telnet client with source IP 1.1.1.1:

```
Switch# configure terminal
Switch(config)# ip access-list telnetACL
Switch(config-ip-acl)# 10 deny tcp host 1.1.1.1 any
Switch(config-ip-acl)# exit
Switch(config)# ip telnet server acl telnetACL
```

### Related Commands

None

## 11.23.2 ip ssh server acl

### Command Purpose

To deny specified SSH client IP, use this command in configuration mode. To delete this configuration, use the no form of this command.

### Command Syntax

ip ssh server acl *NAME*

ip no ssh server acl

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | access-list name | String with up to 40 characters |

### Command Mode

Global Configuration

### Default

No acl is specified

### Usage

Use this command to deny specified SSH client IP.

The access-list should be created before using this command.

ACEs witch non-contiguous subnet masks are not supported for configuration

### Examples

This example shows how to enabe SSh acl, which deny SSH client with source IP 1.1.1.1:

```
Switch# configure terminal
Switch(config)# ip access-list telnetACL
Switch(config-ip-acl)# 10 deny tcp host 1.1.1.1 any
Switch(config-ip-acl)# exit
Switch(config)# ip ssh server acl telnetACL
```

### Related Commands

None

## 11.23.3 service password-encryption

### Command Purpose

To encrypt password of users and line vtys, use this command in configuration mode. To delete this configuration, use the no form of this command.

### Command Syntax

service password-encryption

no service password-encryption

### Command Mode

Global Configuration

### Default

None

## Usage

Use this command to encrypt password of users and line vtys, after this command is configured, existed password or new configued password will be encrypted.

## Examples

The following example shows how to encrypt user password:

```
Switch# configure terminal
Switch(config)# service password-encryption
Switch# show running-config
username admin privilege 4 password 8 56ab359baafb02a3
```

## Related Commands

None

# 11.23.4 http server acl

## Command Purpose

Configure access to the http/https service.

## Command Syntax

http server acl *NAME*

no http server acl

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | access-list name | String with up to 40 characters |

## Command Mode

Global Configuration

## Default

No acl is specified

### Usage

The access-list should be created before using this command. ACE must specify the tcp protocol and source ip address

ACEs witch non-contiguous subnet masks are not supported for configuration

### Examples

This example shows only client with source IP 10.13.16.39 can access web

```
Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# ip access-list web1
Switch(config-ip-acl)# permit tcp 10.13.16.39 0.0.0.0 any
Switch(config-ip-acl)# quit
Switch(config)#http server acl web1
```

### Related Commands

None

## 11.24 MACsec Commands

### 11.24.1 mka policy

### Command Purpose

Create an MKA Policy and enter Policy configuration mode.

### Command Syntax

mka policy *NAME*

no mka policy *NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | Mka policy name | String with up to 40 characters |

### Command Mode

Global Configuration

### Default

There is a default policy: default-policy

### Usage

Create an MKA Policy using this command, and configure the relevant parameters of MKA in Policy configuration mode. The created policy can be applied on the interface.

### Examples

This example shows how to create an MKA Policy named 'hpolicy1':

```
Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# mka policy hpolicy1
Switch(config-mka-policy)#
```

### Related Commands

mka apply policy

## 11.24.2 confidentiality-offset

### Command Purpose

Configure the MKA confidentiality-offset.

### Command Syntax

confidentiality-offset *OFFSET-VALUE*

no confidentiality-offset

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| *OFFSET-VALUE* | MACsec encryption offset | (0\|30\|50) |

### Command Mode

MKA Policy configuration

## Default

Default-value:0

## Usage

MACsec encryption offset, indicating how many bytes are offset from the MACsec TAG field of the data frame to start encryption

## Examples

This example shows how to set the confidentiality-offset is 50 bytes.

```
Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# mka policy hpolicy1
Switch(config-mka-policy)# confidentiality-offset 50
```

## Related Commands

icv-mode normal

# 11.24.3 icv-mode

## Command Purpose

Configure icv mode.The icv-mode can be configured as normal or integrity-only.

## Command Syntax

icv-mode (integrity-only | normal)

no icv-mode

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| integrity-only | Only perform integrity verification without encrypting data. | |
| normal | Perform both data encryption and integrity verification. | |

### Command Mode

MKA Policy configuration

### Default

Default mode:normal

### Usage

Use this command to configure ICV-MODE (Integrity Check Value) and restore it to the default configuration using the 'no' form.

### Examples

This example shows how to set the icv-mode is integrity-only.

```
Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# mka policy hpolicy1
Switch(config-mka-policy)# icv-mode integrity-only
Switch(config-mka-policy)#
```

### Related Commands

confidentiality-offset

## 11.24.4 replay-protection enable

### Command Purpose

Use this command to enable/disable reply-protection.

### Command Syntax

replay-protection enable

no replay-protection enable

## Command Mode

MKA Policy configuration

## Default

Default-state: enable

## Usage

None.

## Examples

This example shows how to disable replay-protection .

```
Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# mka policy hpolicy1
Switch(config-mka-policy)# no replay-protection enable
Switch(config-mka-policy)#
```

## Related Commands

replay-protection window-size

# 11.24.5 replay-protection window-size

## Command Purpose

Use this command to set replay-protection window-size.

## Command Syntax

replay-protection window-size *WINDOW-SIZE*

no replay-protection window-size

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| *WINDOW-SIZE* | Macsec replay protection window size | <0-4294967295> |

### Command Mode

MKA Policy configuration

### Default

Default-value: 0

### Usage

None.

### Examples

This example shows how to set replay-protection window-size.

```
Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# mka policy hpolicy1
Switch(config-mka-policy)# replay-protection window-size 9600
Switch(config-mka-policy)#
```

### Related Commands

replay-protection enable

## 11.24.6 validation-mode

### Command Purpose

Use this command to set validation-mode.

### Command Syntax

validation-mode ( check|strict )

no validation-mode

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| check | only performing verification without discarding illegal data frames | |
| strict | verifying received data frames and discarding illegal data | |

## Command Mode

MKA Policy configuration

## Default

Default-value: check

## Usage

None.

## Examples

This example shows how to set validation-mode .

```
Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# mka policy hpolicy1
Switch(config-mka-policy)# validation-mode strict
Switch(config-mka-policy)#
```

## Related Commands

None

# 11.24.7 mka apply

## Command Purpose

Apply mka policy on the interface.

## Command Syntax

mka apply policy *NAME*

no mka apply policy

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| *NAME* | Mka policy name | String with up to 40 characters |

## Command Mode

interface configuration

## Default

None

## Usage

None.

## Examples

Apply mka policy “hpolicy1” on the interface eth-0-23.

```
Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# interface eth-0-23
Switch(config-if)# mka apply policy hpolicy1
```

## Related Commands

mka policy

# 11.24.8 mka enable

## Command Purpose

Enable mka on the interface.

### Command Syntax

mka enable

no mka enable

### Command Mode

Interface configuration

### Default

None

### Usage

Before enabling MKA, the MKA PSK parameter must be configured on the interface.

### Examples

Enable mka on the interface eth-0-23.

```
Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# interface eth-0-23
Switch(config-if)# mka enable
```

### Related Commands

mka psk

## 11.24.9 mka priority

### Command Purpose

Configure the MKA negotiation priority for the interface.

### Command Syntax

mka priority *VALUE*

no mka priority

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| *VALUE* | Priority-value | <0-255> |

## Command Mode

Interface configuration

## Default

Default value:0

## Usage

Configure MKA priority for electing Key Server, with lower values indicating higher priority.

## Examples

Configure MKA priority of the interface eth-0-23 to 149.

```
Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# interface eth-0-23
Switch(config-if)# mka priority 149
```

## Related Commands

None

# 11.24.10 mka psk

## Command Purpose

Configure the MKA Pre-shared key for the interface.

## Command Syntax

mka psk (cipher-suite (gcm-aes-128|gcm-aes-256)|) ckn *CKN* cak simple *CAK*

no mka psk

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| cipher-suite | Algorithms for encryption, verification, and recovery | gcm-aes-128 or gcm-aes-256 |
| *CKN* | secure Connectivity Association Key Name,Hexadecimal string | |
| *CAK* | secure Connectivity Association Key value,Hexadecimal string | |

## Command Mode

Interface configuration

## Default

None

## Usage

Devices use configured Pre-Shared Key (PSK) as CAK to initiate negotiation sessions through EAPOL-MKA messages.

## Examples

Configure Pre-Shared Key for the interface eth-0-23:

```
Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# interface eth-0-23
Switch(config-if)# mka psk ckn 112233445566aabb cak simple 112233445566aabbcc
```

## Related Commands

None

# 11.24.11 macsec confidentiality-offset

## Command Purpose

Configure the MKA confidentiality-offset for the interface.

## Command Syntax

macsec confidentiality-offset *OFFSET-VALUE*

no macsec confidentiality-offset

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| *OFFSET-VALUE* | MACsec encryption offset | (0\|30\|50) |

## Command Mode

Interface configuration

## Default

None

## Usage

Configure macsec confidentiality-offset for the interface, which will take effect if no policy is applied to the interface.

## Examples

Configure confidentiality-offset for the interface eth-0-23:

```
Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# interface eth-0-23
Switch(config-if)# macsec confidentiality-offset 30
```

## Related Commands

mak apply policy

# 11.24.12 macsec desire

## Command Purpose

Enable macsec on the interface.

### Command Syntax

macsec desire

no macsec desire

### Command Mode

Interface configuration

### Default

None

### Usage

None

### Examples

Enable macsec on the interface eth-0-23:

```
Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# interface eth-0-23
Switch(config-if)# macsec desire
```

### Related Commands

None

## 11.24.13 macsec icv-mode

### Command Purpose

Configure the macsec icv-mode for the interface.

### Command Syntax

macsec icv-mode (integrity-only | normal)

no macsec icv-mode

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| integrity-only | Only perform integrity verification without encrypting data. | |
| normal | Perform both data encryption and integrity verification. | |

## Command Mode

Interface configuration

## Default

Default mode:normal

## Usage

Configure macsec icv-mode for the interface, which will take effect if no policy is applied to the interface.

## Examples

Configure icv-mode for the interface eth-0-23:

```
Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# interface eth-0-23
Switch(config-if)# macsec icv-mode integrity-only
```

## Related Commands

mak apply policy

# 11.24.14 macsec plain-packet-policy

## Command Purpose

Configure the handling of unauthorized packets.

## Command Syntax

macsec plain-packet-policy ( drop | permit )

no macsec plain-packet-policy

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| drop | Discard unauthorized packets. | |
| permit | permit these packets | |

## Command Mode

Interface configuration

## Default

Default mode:drop

## Usage

None

## Examples

Permit the unauthorized packets to transmit on the interface eth-0-23,which will take effect if no policy is applied to the interface:

```
Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# interface eth-0-23
Switch(config-if)# macsec plain-packet-policy permit
```

## Related Commands

mak apply policy

# 11.24.15 macsec replay-protection enable

## Command Purpose

Use this command to enable/disable reply-protection on the interface.

## Command Syntax

macsec replay-protection enable

no macsec replay-protection enable

## Command Mode

Interface configuration

## Default

Default-state: enable

## Usage

None

## Examples

Permit the unauthorized packets to transmit on the interface eth-0-23,which will take effect if no policy is applied to the interface:

```
Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# interface eth-0-23
Switch(config-if)# no macsec replay-protection enable
```

## Related Commands

mka apply policy

# 11.24.16 macsec replay-protection window-size

## Command Purpose

Use this command to set replay-protection window-size on the interface.

## Command Syntax

macsec replay-protection window-size *WINDOW-SIZE*

no macsec replay-protection window-size

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| *WINDOW-SIZE* | Macsec replay protection window size | <0-4294967295> |

## Command Mode

Interface configuration

## Default

Default-value: 0

## Usage

None

## Examples

This example shows how to set replay-protection window-size on the interface eth-0-23,which will take effect if no policy is applied to the interface:

```
Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# interface eth-0-23
Switch(config-if)# macsec replay-protection window-size 9600
```

## Related Commands

macsec replay-protection enable

# 11.24.17 macsec validation-mode

## Command Purpose

Use this command to set validation-mode on the interface.

## Command Syntax

macsec validation-mode ( check|strict )

no macsec validation-mode

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| check | only performing verification without discarding illegal data frames | |
| strict | verifying received data frames and discarding illegal data | |

## Command Mode

Interface configuration

## Default

Default-value: check

## Usage

None.

## Examples

This example shows how to set validation-mode on the interface .

```
Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# inter eth-0-23
Switch(config-if)# macsec validation-mode  strict
Switch(config-if)#
```

## Related Commands

mka apply policy

# 11.24.18 show macsec interface

## Command Purpose

Use this command to show the MACSEC status and parameter of the interface.

## Command Syntax

show macsec interface ( *IFNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| *IFNAME* | Physical interface | |

## Command Mode

Exec configuration

## Default

None

## Usage

None.

## Examples

This example shows how to show macsec status and parameter of all the interface .

```
Switch# show macsec interface
Interface eth-0-23:
 Protect frames               : yes
 Active MKA policy            : N/A
 Replay protection            : yes
 Replay window size           : 42949672 frames
   Icv mode                     : normal
   Confidentiality offset       : 30 bytes
 Validation mode              : check
 Plain packet policy          : drop
 Included SCI                 : yes
 Transmit secure channel:
  SCI               : D85B 2200 0401 0017
  Elapsed time      : 06h:47m:20s
  Current SA        : AN 2
 Receive secure channel:
  SCI               : 0001 0203 0D02 002F
  Elapsed time      : 06h:47m:20s
  Current SA        : AN 2
  Previous SA       : AN 1

Switch#
```

### Related Commands

None

## 11.24.19 show macsec statistics

### Command Purpose

Use this command to show MACSEC statistical information related to the interface.

### Command Syntax

show macsec statistics interface (*IFNAME*|)

### Command Mode

Exec configuration

### Default

None

### Usage

None.

### Examples

This example shows how to show MACSEC statistical information of all the interface .

```
Switch# show macsec statistics interface
Interface eth-0-48 statistics:
 Output:
  SC Protected packets          : 0
  SC Encrypted packets          : 0
  SA Protected packets          : 0
  SA Encrypted packets          : 0
 Input:
  SC OK packets                 : 0
  SC Unchecked packets          : 0
  SC Delayed packets            : 0
  SC Invalid packets            : 0
```

```
 SC NotValid packets           : 0
 SC Late packets               : 0
 SC NotUsingSA packets         : 0
 SC UnusedSA packets           : 0
 SA OK packets                 : 0
 SA Unchecked packets          : 0
 SA Delayed packets            : 0
 SA Invalid packets            : 0
 SA NotValid packets           : 0
 SA Late packets               : 0
 SA NotUsingSA packets         : 0
 SA UnusedSA packets           : 0


Interface eth-0-47 statistics:
 Output:
 SC Protected packets          : 3039
 SC Encrypted packets          : 10979
 SA Protected packets          : 0
 SA Encrypted packets          : 1135
 Input:
 SC OK packets                 : 13570
 SC Unchecked packets          : 0
 SC Delayed packets            : 0
 SC Invalid packets            : 0
 SC NotValid packets           : 0
 SC Late packets               : 0
 SC NotUsingSA packets         : 0
 SC UnusedSA packets           : 0
 SA OK packets                 : 1135
 SA Unchecked packets          : 0
 SA Delayed packets            : 0
 SA Invalid packets            : 0
 SA NotValid packets           : 0
 SA Late packets               : 0
 SA NotUsingSA packets         : 0
 SA UnusedSA packets           : 0


Switch#
```

### Related Commands

None

## 11.24.20 show mka default-policy

### Command Purpose

Use this command to show the default MKA policy.

### Command Syntax

show mka default-policy

### Command Mode

Exec configuration

### Default

None

### Usage

None.

### Examples

This example shows how to show the default MKA policy .

```
Switch# show mka default-policy
PolicyName       ReplayProt WindowSize IcvMode        ConfOffset Validation
default-policy   yes        0          normal         0          strict
Switch#
```

### Related Commands

None

## 11.24.21 show mka policy

### Command Purpose

Use this command to show mka policy.

### Command Syntax

show mka policy (*NAME*|)

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| *NAME* | MKA Policy name | |

## Command Mode

Exec configuration

## Default

None

## Usage

None.

## Examples

Show all MKA Policies.

```
Switch# show mka policy
PolicyName       ReplayProt WindowSize IcvMode        ConfOffset Validation
default-policy   yes        0          normal         0          strict
mkatest          yes        9600       integrity-only 30         check
mkatest2         yes        0          normal         50         strict
Switch#
```

## Related Commands

None

# 11.24.22 show mka session interface

## Command Purpose

Use this command to show MKA session negotiation status.

## Command Syntax

show mka session interface ( *IFNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| *IFNAME* | Physical interface | |

## Command Mode

Exec configuration

## Default

None

## Usage

None.

## Examples

Show mka session status of all interface:

```
Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# inter eth-0-23
Switch(config-if)# macsec validation-mode  strict
Switch(config-if)#
Switch# show mka session interface
Interface eth-0-48:
 Tx-SCI              : 0001 0203 0D02 0030
 Priority            : 20
 Capability          : 3
  CKN for participant : 1122 3344 5566 AABB 0000 0000 0000 0000
   Key server                    : no
   MI (MN)                       : 5211 0555 4051 5055 0706 4110 (43443)
   Principal actor               : yes
   MKA session status            : succeeded
   Icv mode                      : integrity-only
   Confidentiality offset        : N/A
   Current SAK status            : rx & tx
   Current SAK AN                : 1
   Current SAK Cipher Suite      : gcm-aes-128
   Current SAK KI (KN)           : D044 1010 C040 C410 84C4 8044 0000 001A (26)
   Previous SAK status           : rx
   Previous SAK AN               : 0
   Previous SAK Cipher Suite     : gcm-aes-128
   Previous SAK KI (KN)          : D044 1010 C040 C410 84C4 8044 0000 0019 (25)
   Peer list:
   MI                            MN         Priority Capability Rx-SCI

   D044 1010 C040 C410 84C4 8044 43441      15       3          D85B 2212 0A6D 0
018

Interface eth-0-47:
 Tx-SCI              : 0001 0203 0D02 002F
 Priority            : 20
```

```
Capability          : 3
 CKN for participant : 1122 3344 5566 AABB 0000 0000 0000 0000
  Key server                    : no
  MI (MN)                       : 2266 4573 1367 1300 4657 5270 (12954)
  Principal actor               : yes
  MKA session status            : succeeded
  Icv mode                      : normal
  Confidentiality offset        : 30 bytes
  Current SAK status            : rx & tx
  Current SAK AN                : 3
  Current SAK Cipher Suite      : gcm-aes-128
  Current SAK KI (KN)           : 1800 9898 8098 0008 0090 9898 0000 0008 (8)
  Previous SAK status           : rx
  Previous SAK AN               : 2
  Previous SAK Cipher Suite     : gcm-aes-128
  Previous SAK KI (KN)          : 1800 9898 8098 0008 0090 9898 0000 0007 (7)
  Peer list:
  MI                            MN         Priority Capability Rx-SCI

  1800 9898 8098 0008 0090 9898 12941      19       3          D85B 2200 0401 0
017

Switch#
```

## Related Commands

None

# 11.24.23 show mka statistics interface

## Command Purpose

Use this command to show mka statistics of interface.

## Command Syntax

show mka statistics interface ( *IFNAME*| )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| *IFNAME* | Physical interface | |

## Command Mode

Exec configuration

## Default

None

## Usage

None.

## Examples

Show mka statistics of all interface:

```
Switch# show mka statistics interface
Interface eth-0-48 statistics:
 MKPDUs with invalid CKN       : 0
 MKPDUs with invalid ICV       : 0
 MKPDUs with Rx error          : 0
 CKN for participant           : 1122 3344 5566 AABB 0000 0000 0000 0000
  Tx MKPDUs                    : 43520
  Rx MKPDUs                    : 43513
  MKPDUs with invalid MN       : 0
  MKPDUs with Tx error         : 2
  SAKs distributed             : 0
  SAKs received                : 26

Interface eth-0-47 statistics:
 MKPDUs with invalid CKN       : 0
 MKPDUs with invalid ICV       : 0
 MKPDUs with Rx error          : 0
 CKN for participant           : 1122 3344 5566 AABB 0000 0000 0000 0000
  Tx MKPDUs                    : 42968
  Rx MKPDUs                    : 42659
  MKPDUs with invalid MN       : 0
  MKPDUs with Tx error         : 0
  SAKs distributed             : 0
  SAKs received                : 38

Switch#
```

## Related Commands

None

# 12 IPv6 Security Commands

## 12.1 DHCPv6 Snooping Commands

### 12.1.1 clear dhcpv6 snooping bindings learning

#### Command Purpose

Use the clear dhcpv6 snooping bindings learning privileged EXEC command on the switch to clear the dynamic DHCPv6 binding items.

#### Command Syntax

clear dhcpv6 snooping bindings ( learning | manual ) ( ipv6 *IP-ADDRESS* | mac *MAC-ADDRESS* | vlan *VLAN-ID* | interface *IFNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ipv6 IP-ADDRESS | Clear the binding entry with the IPv6 address | IPv6 Address |
| mac MAC-ADDRESS | Clear the binding entry with the MAC address | MAC address |
| vlan VLAN-ID | Clear the binding entry with the VLAN | 1-4094 |
| interface IFNAME | Clear the binding entry with the Interface | Support physical/aggregation ports |

#### Command Mode

Privileged EXEC

#### Default

No default is defined.

### Usage

This command is used to clear DHCPv6 snooping binding.

### Examples

This example shows how to clear all DHCPv6 snooping binding learning items:

```
Switch# clear dhcpv6 snooping bindings learning
```

### Related Commands

show dhcpv6 snooping binding

## 12.1.2 clear dhcpv6 snooping statistics

### Command Purpose

Use the clear dhcpv6 snooping statistics privileged EXEC command on the switch to clear the DHCPv6 snooping statistics counters.

### Command Syntax

clear dhcpv6 snooping statistics

### Command Mode

Privileged EXEC

### Default

No default is defined.

### Usage

This command is used to clear DHCPv6 snooping statistics.

### Examples

This example shows how to clear the DHCPv6 snooping statistics counters:

```
Switch# clear dhcpv6 snooping statistics
```

### Related Commands

show dhcpv6 snooping statistics

## 12.1.3 dhcpv6 snooping

### Command Purpose

Use the dhcpv6 snooping global configuration command on the switch to globally enable DHCPv6 snooping.

Use the no form of this command to return to the default setting.

### Command Syntax

dhcpv6 snooping

no dhcpv6 snooping

### Command Mode

Global Configuration

### Default

DHCPv6 snooping is disabled.

### Usage

For any DHCPv6 snooping configuration to take effect, you must globally enable DHCPv6 snooping. DHCPv6 snooping is not active until you enable snooping on a VLAN by using the dhcpv6 snooping vlan global configuration command.

You can verify your settings by entering the show dhcpv6 snooping config privileged EXEC command

### Examples

This example shows how to enable DHCPv6 snooping:

```
Switch# configure terminal
Switch(config)# dhcpv6 snooping
```

### Related Commands

dhcpv6 snooping vlan

show dhcpv6 snooping config

## 12.1.4 dhcpv6 snooping binding

### Command Purpose

Use the dhcpv6 snooping binding global configuration command on the switch to configure the DHCPv6 snooping binding database and to add binding entries to the database.

### Command Syntax

dhcpv6 snooping binding mac *MAC-ADDRESS* vlan *VLAN-ID* ipv6 *IP-ADDRESS* interface *IFNAME* expiry *SECONDS*

no dhcpv6 snooping bindings ( ipv6 *IP-ADDRESS* | mac *MAC-ADDRESS* | vlan *VLAN-ID* | interface *IFNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| mac MAC-ADDRESS | Specify a MAC address | MAC address |
| vlan VLAN-ID | Specify a VLAN number. | 1-4094 |
| ipv6 IP-ADDRESS | Specify an IPv6 address | IPv6 Address |
| interface IFNAME | Specify an interface on which to add or delete a binding entry | Support physical/aggregation ports |
| expiry SECONDS | Specify the interval (in seconds) after which the binding entry is no longer valid. The range is 0 to 86400 | 0-86400 seconds |

### Command Mode

Global Configuration

## Default

No default database is defined.

## Usage

Use this command when you are testing or debugging the switch.

In the DHCPv6 snooping binding database, each database entry, also referred to a binding, has an IP address, an associated MAC address, the lease time, the interface to which the binding applies, and the VLAN to which the interface belongs.

Use the show dhcpv6 snooping binding privileged EXEC command to display the configured bindings.

## Examples

This example shows how to generate a DHCPv6 binding with an expiration time of 1000 seconds on a port in VLAN 1:

```
Switch# configure terminal
Switch(config)# dhcpv6 snooping binding mac 0001.000c.01ef vlan 1 ipv6 2001:1::1
interface eth-0-1 expiry 1000
```

## Related Commands

show dhcpv6 snooping binding

# 12.1.5 dhcpv6 snooping no-binding vlan

## Command Purpose

Use the dhcpv6 snooping no-binding vlan global configuration command on the switch to enable DHCPv6 snooping do not record dynamic binding table of specified VLAN. Use the no form of this command to return to the default setting.

## Command Syntax

dhcpv6 snooping no-binding vlan *VLAN-RANGE*

no dhcpv6 snooping no-binding vlan *VLAN-RANGE*

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| VLAN-RANGE | Specify a VLAN ID or a range of VLANs on which to enable DHCPv6 snooping no-binding. | 1-4094 |

## Command Mode

Global Configuration

## Default

DHCPv6 snooping no-binding is disabled on all VLANs.

## Usage

You can enter a single VLAN ID identified by VLAN ID number, a series of VLAN IDs separated by commas, a range of VLAN IDs separated by hyphens, or a range of VLAN IDs separated by entering the starting and ending VLAN IDs separated by a space.Existed dhcpv6 snooping dynamic recording tables of a VLAN will be deleted when no-binding is enabled on this VLAN.

## Examples

This example shows how to enable DHCPv6 snooping no-binding on VLAN 10:

```
Switch# configure terminal
Switch(config)# dhcpv6 snooping no-binding vlan 10
```

## Related Commands

None

# 12.1.6 dhcpv6 snooping database

## Command Purpose

Use the dhcpv6 snooping database global configuration command on the switch to configure the DHCPv6 snooping binding database agent. Use the no form of this command to reset the write-delay value.

## Command Syntax

dhcpv6 snooping database auto-save interval *SECONDS*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| interval SECONDS | Specify the interval (in seconds) that how long to save the binding database. | 15-2000 seconds |

## Command Mode

Global Configuration

## Default

Default interval is 600 seconds.

## Usage

The DHCPv6 snooping database is save as flash:/dhcpv6snooping.

## Examples

The following is sample output from the dhcpv6 snooping database command:

```
Switch# configure terminal
Switch(config)# dhcpv6 snooping database auto-save interval 120
```

## Related Commands

dhcpv6 snooping

dhcpv6 snooping binding

# 12.1.7 dhcpv6 snooping interface-id format

## Command Purpose

Use the dhcpv6 snooping interface-id format global configuration command on the switch to configure the format of dhcpv6 snooping interface-id. Use the no form of this command to set the format of dhcpv6 snooping interface-id to default format.

## Command Syntax

dhcpv6 snooping interface-id ( vlan *VLAN-ID* | ) format { vlan-id | ifname | hostname | mac | string *STRING* }

no dhcpv6 snooping interface-id ( vlan *VLAN-ID* | ) format

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| vlan VLAN-ID | Set interface-id format for packets with the VLAN | 1-4094 |
| vlan-id | Insert svlan of received packet to interface-id | - |
| ifname | Insert the name of the interface received packet from client to interface-id | - |
| hostname | Insert host name of the switch to interface-id | - |
| mac | Insert the mac address of the interface received packet from client to interface-id | - |
| string STRING | Insert user-defined string in interface-id | - |

## Command Mode

Global Configuration

## Default

Default format is vlan:ifname:hostname:mac:

## Usage

The format of interface-id can be a combination of vlan, interface name, hostname mac and user-defined string. This command specifies the existing keywords in the combination.

If format is configured to specified vlan, only DHCPv6 packets with the vlan are configured with this format; If not, all DHCPv6 request packets will be configured with specified format.

If option18 format is set on a port, it has high priority for DHCPv6 packets received from this port when insert interface-id option.

### Examples

The following example shows how to specify the format of interface-id:

```
Switch# configure terminal

Switch(config)# dhcpv6 snooping interface-id format vlan ifname string abc123
```

### Related Commands

dhcpv6 snooping interface-id option

## 12.1.8 dhcpv6 snooping interface-id option

### Command Purpose

Use the dhcpv6 snooping interface-id option global configuration command on the switch to globally enable insert dhcpv6 snooping interface-id. Use the no form of this command to globally disable insert dhcpv6 snooping interface-id.

### Command Syntax

dhcpv6 snooping interface-id option

no dhcpv6 snooping interface-id option

### Command Mode

Global Configuration

### Default

Insert interface-id is disabled

### Usage

None

### Examples

The following example shows how to enable interface-id option:

```
Switch# configure terminal

Switch(config)# dhcpv6 snooping interface-id option
```

### Related Commands

dhcpv6 snooping interface-id format

## 12.1.9 dhcpv6 snooping interface-id policy

### Command Purpose

Use the dhcpv6 snooping interface-id policy global configuration command on the switch to globally configure the policy for dhcpv6 snooping interface-id. Use the no form of this command to set the policy of dhcpv6 snooping interface-id to default.

### Command Syntax

dhcpv6 snooping interface-id policy ( drop | keep | replace )

no dhcpv6 snooping interface-id policy

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| drop | Drop packets with interface-id | - |
| keep | Keep interface-id in packets untouched | - |
| replace | Replace interface-id in packets with new generated | - |

### Command Mode

Global Configuration

### Default

Default policy is replace

## Usage

If option18 policy is set on a port, it has high priority when insert interface-id option for DHCPv6 packets received from this port .

## Examples

The following example shows how to specify the policy for interface-id:

```
Switch# configure terminal

Switch(config)# dhcpv6 snooping interface-id policy replace
```

## Related Commands

dhcpv6 snooping interface-id option

# 12.1.10 dhcpv6 snooping option18 format

## Command Purpose

Use the dhcpv6 snooping option18 format configuration command on the switch to configure the format of dhcpv6 snooping option18 on a port. Use the no form of this command to set the format of dhcpv6 snooping option18 to default format on a port.

## Command Syntax

dhcpv6 snooping option18 ( vlan *VLAN-ID* | ) format { vlan-id | ifname | hostname | mac | string *STRING* }

no dhcpv6 snooping option18 ( vlan *VLAN-ID* | ) format

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| vlan VLAN-ID | Set option18 format for packets with the VLAN | 1-4094 |
| vlan-id | Insert svlan of received packet to option18 | - |
| ifname | Insert the name of the interface received packet from client to option18 | - |
| hostname | Insert host name of the switch to option18 | - |

| | | |
|---|---|---|
| mac | Insert the mac address of the interface received packet from client to option18 | - |
| string STRING | Insert user-defined string in option18 | - |

## Command Mode

Interface Configuration

## Default

Default format is vlan:ifname:hostname:mac:

## Usage

The format of option18 can be a combination of vlan, interface name, hostname mac and user-defined string. This command specifies the existing keywords in the combination.

If format is configured to specified vlan, only DHCPv6 packets with the vlan are configured with this format; If not, all DHCPv6 request packets will be configured with specified format.

## Examples

The following example shows how to specify the format of option18:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# dhcpv6 snooping option18 format vlan ifname string abc123
```

## Related Commands

dhcpv6 snooping option18 option

## 12.1.11 dhcpv6 snooping option18

### Command Purpose

Use the dhcpv6 snooping option18 option configuration command on the switch to enable insert dhcpv6 snooping option18 on a port. Use the no form of this command to disable insert dhcpv6 snooping option18 on a port.

### Command Syntax

dhcpv6 snooping option18

no dhcpv6 snooping option18

### Command Mode

Interface Configuration

### Default

Insert option18 is disabled

### Usage

None

### Examples

The following example shows how to enable option18 option:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# dhcpv6 snooping option18
```

### Related Commands

dhcpv6 snooping option18 format

## 12.1.12 dhcpv6 snooping option18 policy

### Command Purpose

Use the dhcpv6 snooping option18 policy configuration command on the switch to configure the policy for dhcpv6 snooping option18 on a port. Use the no form of this command to set the policy of dhcpv6 snooping option18 to default on a port.

### Command Syntax

dhcpv6 snooping option18 policy ( drop | keep | replace )

no dhcpv6 snooping option18 policy

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| drop | Drop packets with option18 | - |
| keep | Keep option18 in packets untouched | - |
| replace | Replace option18 in packets with new generated | - |

### Command Mode

Interface Configuration

### Default

Default policy is keep

### Usage

None

### Examples

The following example shows how to specify the policy for option18:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# dhcpv6 snooping option18 policy replace
```

## Related Commands

dhcpv6 snooping option18 option

# 12.1.13 dhcpv6 snooping remote-id format

## Command Purpose

Use the dhcpv6 snooping remote-id format global configuration command on the switch to configure the format of dhcpv6 snooping remote-id. Use the no form of this command to set the format of dhcpv6 snooping remote-id to default format.

## Command Syntax

dhcpv6 snooping remote-id ( vlan <1-4094> | ) format { duid | vlan-id | ifname | hostname | mac | string *STRING* }

no dhcpv6 snooping remote-id ( vlan <1-4094> | ) format

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| vlan VLAN-ID | Set option37 format for packets with the VLAN | - |
| duid | Insert system's DUID in remote-id | - |
| vlan-id | The ID of the vlan attached by client | - |
| ifname | The name of the interface received packet from client | - |
| hostname | Insert host name of the switch to remote-id | - |
| mac | Insert the mac address of the interface received packet from client to remote-id | - |
| string STRING | Insert user-defined string in remote-id | - |

## Command Mode

Global Configuration

### Default

Default format is MAC

### Usage

The format of remote-id can be a combination of vlan, interface name, DUID. This command specifies the existing keywords in the combination.

### Examples

The following example shows how to specify the format of remote-id:

```
Switch# configure terminal

Switch(config)# dhcpv6 snooping remote-id format duid vlan ifname
```

### Related Commands

dhcpv6 snooping remote-id option

## 12.1.14 dhcpv6 snooping remote-id option

### Command Purpose

Use the dhcpv6 snooping remote-id option global configuration command on the switch to globally enable insert dhcpv6 snooping remote-id. Use the no form of this command to globally disable insert dhcpv6 snooping remote-id.

### Command Syntax

dhcpv6 snooping remote-id option

no dhcpv6 snooping remote-id option

### Command Mode

Global Configuration

### Default

Insert remote-id is disabled

### Usage

None

### Examples

The following example shows how to enable remote-id option:

```
Switch# configure terminal

Switch(config)# dhcpv6 snooping remote-id option
```

### Related Commands

dhcpv6 snooping remote-id format

## 12.1.15 dhcpv6 snooping remote-id policy

### Command Purpose

Use the dhcpv6 snooping remote-id policy global configuration command on the switch to globally configure the policy for dhcpv6 snooping remote-id. Use the no form of this command to set the policy of dhcpv6 snooping remote-id to default.

### Command Syntax

dhcpv6 snooping remote-id policy ( drop | keep | replace )

no dhcpv6 snooping remote-id policy

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| drop | Drop packets with remote-id | - |
| keep | Keep remote-id in packets untouched | - |
| replace | Replace remote-id in packets with new generated | - |

### Command Mode

Global Configuration

### Default

Default policy is replace

### Usage

If option37 policy is set on a port, it has high priority when insert remote-id option for DHCPv6 packets received from this port .

### Examples

The following example shows how to specify the policy for remote-id:

```
Switch# configure terminal

Switch(config)# dhcpv6 snooping remote-id policy replace
```

### Related Commands

dhcpv6 snooping remote-id option

## 12.1.16 dhcpv6 snooping option37 format

### Command Purpose

Use the dhcpv6 snooping option37 format configuration command on the switch to configure the format of dhcpv6 snooping option37 on a port. Use the no form of this command to set the format of dhcpv6 snooping option37 to default format on a port.

### Command Syntax

dhcpv6 snooping option37 ( vlan *VLAN-ID* | ) format { duid | vlan-id | ifname | hostname | mac | string *STRING* }

no dhcpv6 snooping option37 ( vlan *VLAN-ID* | ) format

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| vlan VLAN-ID | Set option37 format for packets with the VLAN | 1-4094 |
| duid | The DUID of system | - |
| vlan-id | Insert svlan of received packet to option37 | - |
| ifname | Insert the name of the interface received packet from client to option37 | - |
| hostname | Insert host name of the switch to option37 | - |
| mac | Insert the mac address of the interface received packet from client to option37 | - |
| string STRING | Insert user-defined string in option37 | - |

## Command Mode

Interface Configuration

## Default

Default format is mac

## Usage

The format of option37 can be a combination of vlan, interface name, hostname mac and user-defined string. This command specifies the existing keywords in the combination.

If format is configured to specified vlan, only DHCPv6 packets with the vlan are configured with this format; If not, all DHCPv6 request packets will be configured with specified format.

## Examples

The following example shows how to specify the format of option37:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# dhcpv6 snooping option37 format vlan ifname string abc123
```

### Related Commands

dhcpv6 snooping option37 option

## 12.1.17 dhcpv6 snooping option37

### Command Purpose

Use the dhcpv6 snooping option37 option configuration command on the switch to enable insert dhcpv6 snooping option37 on a port. Use the no form of this command to disable insert dhcpv6 snooping option37 on a port.

### Command Syntax

dhcpv6 snooping option37

no dhcpv6 snooping option37

### Command Mode

Interface Configuration

### Default

Insert option37 is disabled

### Usage

None

### Examples

The following example shows how to enable option37 option:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# dhcpv6 snooping option37
```

### Related Commands

dhcpv6 snooping option37 format

# 12.1.18 dhcpv6 snooping option37 policy

## Command Purpose

Use the dhcpv6 snooping option37 policy configuration command on the switch to configure the policy for dhcpv6 snooping option37 on a port. Use the no form of this command to set the policy of dhcpv6 snooping option37 to default on a port.

## Command Syntax

dhcpv6 snooping option37 policy ( drop | keep | replace )

no dhcpv6 snooping option37 policy

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| drop | Drop packets with option37 | - |
| keep | Keep option37 in packets untouched | - |
| replace | Replace option37 in packets with new generated | - |

## Command Mode

Interface Configuration

## Default

Default policy is keep

## Usage

None

## Examples

The following example shows how to specify the policy for option37:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# dhcpv6 snooping option37 policy replace
```

### Related Commands

dhcpv6 snooping option37 option

## 12.1.19 dhcpv6 snooping trust

### Command Purpose

Use the dhcpv6 snooping trust interface configuration command on the switch to configure a port as trusted for DHCPv6 snooping purposes.

Use the no form of this command to return to the default setting.

### Command Syntax

dhcpv6 snooping trust

no dhcpv6 snooping trust

### Command Mode

Interface Configuration

### Default

DHCPv6 snooping trust is disabled.

### Usage

Configure as trusted ports those that are connected to a DHCPv6 server or to other switches or routers. Configure as entrusted ports those that are connected to DHCPv6 clients.

### Examples

This example shows how to enable DHCPv6 snooping trust on a port:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# dhcpv6 snooping trust
```

### Related Commands

show dhcpv6 snooping trusted-sources

## 12.1.20 dhcpv6 snooping no-binding

### Command Purpose

Use the dhcpv6 snooping no-binding interface configuration command on the switch to configure a port do not record dynamic recording table for DHCPv6 snooping. Use the no form of this command to return to the default setting.

### Command Syntax

dhcpv6 snooping no-binding

no dhcpv6 snooping no-binding

### Command Mode

Interface Configuration

### Default

DHCPv6 snooping no-binding is disabled.

### Usage

Existed DHCPv6 snooping dynamic recordings on a port will be deleted when no-binding enabled on this port.

### Examples

This example shows how to enable DHCPv6 snooping no-binding on a port:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# dhcpv6 snooping no-binding
```

## Related Commands

None

# 12.1.21 dhcpv6 snooping vlan

## Command Purpose

Use the dhcpv6 snooping vlan global configuration command on the switch to enable DHCPv6 snooping on a VLAN. Use the no form of this command to return to the default setting.

## Command Syntax

dhcpv6 snooping vlan *VLAN-RANGE*

no dhcpv6 snooping vlan *VLAN-RANGE*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN-RANGE | Specify a VLAN ID or a range of VLANs on which to enable DHCP snooping. | 1-4094 |

## Command Mode

Global Configuration

## Default

DHCPv6 snooping is disabled on all VLANs.

## Usage

You can enter a single VLAN ID identified by VLAN ID number, a series of VLAN IDs separated by commas, a range of VLAN IDs separated by hyphens, or a range of VLAN IDs separated by entering the starting and ending VLAN IDs separated by a space.

You must first globally enable DHCPv6 snooping before enabling DHCPv6 snooping on a VLAN.

## Examples

This example shows how to enable DHCPv6 snooping on VLAN 10:

```
Switch# configure terminal
Switch(config)# dhcpv6 snooping vlan 10
```

## Related Commands

show dhcpv6 snooping config

# 12.1.22 debug dhcpv6 snooping

## Command Purpose

Use this command to turn on the debug switches of dhcpv6 snooping module.

To restore the default, use the no form of this command

## Command Syntax

debug dhcpv6 snooping ( events | error | dump | packet | all )

no debug dhcpv6 snooping ( events | error | dump | packet | all )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| events | Snooping events | - |
| error | Error DHCPv6 message | - |
| packet | DHCPv6 message fields | - |
| dump | Dump message in hex format | - |
| all | Turn all debugging on | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

Use command "terminal monitor" to make debug messages print on the VTY immediately.

Use command "show logging buffer" to check the debug messages in the logging buffer.

## Examples

The following is sample to open dhcpv6 snooping debug switches:

```
Switch# debug dhcpv6 snooping all
```

## Related Commands

terminal monitor

show logging buffer

# 12.1.23 show dhcpv6 snooping binding

## Command Purpose

Use the show dhcpv6 snooping binding privileged EXEC command to display the DHCPv6 snooping binding database and configuration information for all interfaces on a switch.

## Command Syntax

show dhcpv6 snooping binding ( （all | manual | learning ） ( ipv4 *IP-ADDRESS* | mac *MAC-ADDRESS* | vlan *VLAN-ID* | interface *IFNAME* | ) summary | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| all | Display all entries | - |
| manual | Display static entries | - |
| learning | Display dynamic entries | - |
| mac MAC-ADDRESS | Specify MAC address | MAC address |
| vlan VLAN-ID | Specify a VLAN number. | 1-4094 |
| ipv4 IP-ADDRESS | Specify an IP address | IPv4 Address |

| | | |
|---|---|---|
| interface IFNAME | Specify an interface on which to add or delete a binding entry | Support physical/aggregation ports |
| summary | Display summary information of DHCPv6 snooping bindings | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

If DHCPv6 snooping is enabled and an interface changes to the down state, the switch does not delete the statically configured bindings.

## Examples

The following is sample output from the show dhcpv6 snooping binding command:

```
Switch# show dhcpv6 snooping binding all
DHCPv6 snooping binding table:
VLAN MAC Address    Interface  Lease(s)   IPv6 Address
============================================================
1    0001.0001.0001 eth-0-2    static     1:1::1:1
Switch# show dhcpv6 snooping binding summary
Total 1 DHCPv6 snooping binding entries
    0 learning entry, 1 configured entry
```

## Related Commands

dhcpv6 snooping binding

# 12.1.24 show dhcpv6 snooping config

## Command Purpose

Use the show dhcpv6 snooping privileged EXEC command to display the DHCPv6 snooping configuration.

### Command Syntax

show dhcpv6 snooping config

### Command Mode

Privileged EXEC

### Default

None

### Usage

This command is used to display the configuration of DHCPv6 snooping.

### Examples

The following is sample output from the show dhcpv6 snooping config command:

```
Switch# show dhcpv6 snooping config
dhcpv6 snooping service: enabled
dhcpv6 snooping switch: enabled
dhcpv6 snooping vlan 3
```

### Related Commands

dhcpv6 snooping

dhcpv6 snooping vlan

## 12.1.25 show dhcpv6 snooping trusted-sources

### Command Purpose

Use the show dhcpv6 snooping trusted-sources privileged EXEC command to display the DHCPv6 snooping trusted interface.

### Command Syntax

show dhcpv6 snooping trusted-sources

### Command Mode

Privileged EXEC

### Default

None

### Usage

This command is used to display the trusted interface of DHCPv6 snooping.

### Examples

The following is sample output from the show dhcpv6 snooping trusted-sources command:

```
Switch# show dhcpv6 snooping trusted-source
List of DHCPv6 snooping trusted interface(s):
============================================================
eth-0-20
```

### Related Commands

dhcpv6 snooping trust

## 12.1.26 show dhcpv6 snooping statistics

### Command Purpose

Use the show dhcpv6 snooping statistics privileged EXEC command to display DHCPv6 snooping statistics.

### Command Syntax

show dhcpv6 snooping statistics

### Command Mode

Privileged EXEC

## Default

None

## Usage

This command is used to display the statistics of DHCPv6 snooping.

## Examples

The following is sample output from the show dhcpv6 snooping statistics command:

```
Switch# show dhcpv6 snooping statistics
DHCPv6 snooping statistics:
============================================================
DHCPv6 packets                          137
Packets forwarded                       137
Packets invalid                         0
Packets dropped                         0
```

## Related Commands

clear dhcpv6 snooping statistics

# 13 Reliability Commands

## 13.1 BHM Commands

### 13.1.1 sysmon enable

#### Command Purpose

Use this command to enable system monitor. Use the no command to disable system monitor.

#### Command Syntax

sysmon enable

no sysmon enable

#### Command Mode

Global Configuration

#### Default

Sysmon is enabled by default.

#### Usage

None

#### Examples

The following example shows how to enable system monitor:

```
Switch# configure terminal
Switch(config)# sysmon enable
```

### Related Commands

show sysmon

## 13.1.2 show sysmon

### Command Purpose

Use this command to show system monitor information.

### Command Syntax

show sysmon

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following example shows how to display system monitor status:

```
Switch# show sysmon
System monitor enable.
```

### Related Commands

sysmon enable

## 13.1.3 heart-beat-monitor enable

### Command Purpose

Use this command to enable heart beat monitor. Use the no command to disable heart beat monitor.

### Command Syntax

heart-beat-monitor enable

no heart-beat-monitor enable

### Command Mode

Global Configuration

### Default

The default of heart beat monitor is enabled.

### Usage

None

### Examples

The following example shows how to enable heart beat monitor:

```
Switch# configure terminal
Switch(config)# heart-beat-monitor enable
```

### Related Commands

show heart-beat-monitor

## 13.1.4 heart-beat-monitor reactivate

### Command Purpose

Use this command to specify a reactivation after process crash.

## Command Syntax

heart-beat-monitor reactivate ( reload system | shutdown port | warning )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| reload system | reload system | - |
| shutdown port | shutdown all port when system crash | - |
| warning | print warning on screen | - |

## Command Mode

Global Configuration

## Default

The default reactivation is to reload system.

## Usage

None

## Examples

The following example shows how to set heart-beat-monitor the reactivation:

```
Switch# configure terminal
Switch(config)# heart-beat-monitor reactivate reload system
```

## Related Commands

show heart-beat-monitor

# 13.1.5 show heart-beat-monitor

## Command Purpose

Use this command to show heart beat monitor status.

## Command Syntax

show heart-beat-monitor

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following example shows how to show system monitor information:

```
Switch# show heart-beat-monitor
heart-beat-monitor enable.
heart-beat-monitor reactivation: restart system.
```

### Related Commands

heart-beat-monitor enable

heart-beat-monitor reactivate

## 13.2 EFM Commands

### 13.2.1 ethernet oam enable

### Command Purpose

Use this command to enable Ethernet operations, maintenance, and administration (OAM) on an interface.

Use the no form of this command to disable OAM on an interface.

### Command Syntax

ethernet oam enable

no ethernet oam enable

### Command Mode

Interface Configuration

### Default

The default status of Ethernet OAM is disabled.

### Usage

This command is used to enable the Ethernet OAM module on a port.

### Examples

The following example shows how to enable Ethernet OAM:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ethernet oam enable
```

### Related Commands

no ethernet oam enable

## 13.2.2 ethernet oam mode

### Command Purpose

Use the command to configure Ethernet OAM mode on an interface

### Command Syntax

ethernet oam mode active

ethernet oam mode passive

no ethernet oam mode

### Command Mode

Interface Configuration

## Default

The default Ethernet OAM mode for the DTE is passive.

## Usage

This command is used to set the DTE to active mode or passive mode.

## Examples

The following example shows how to set EFM mode:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ethernet oam mode active
Switch(config-if)# ethernet oam mode passive
```

## Related Commands

None

# 13.2.3 ethernet oam min-rate

## Command Purpose

Use this command to set the OAMPDU timer. Use the no form of the command to reset to default value.

## Command Syntax

ethernet oam min-rate *SECONDS*

no ethernet oam min-rate

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SECONDS | The number of seconds chosen for this timer. | 1-10 seconds |

## Command Mode

Interface Configuration

## Default

The default value of the OAMPDU timer is 1 second

## Usage

Set the timer to emit at least one OAMPDU per second and ensure that the sublayer adheres to the maximum number of OAMPDUs per second. The minimum is 1 OAMPDU per second and the maximum is 10 OAMPDU per second

## Examples

The following example shows how to set the OAMPDU timer to 1:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ethernet oam min-rate 1
```

## Related Commands

show ethernet oam status

# 13.2.4 ethernet oam max-rate

## Command Purpose

Use this command to set the OAMPDU maximum number of PDUS per second. Use the no form of the command to reset max-rate to the default value.

## Command Syntax

ethernet oam max-rate *PDUS*

no ethernet oam max-rate

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PDUS | The maximum number of PDUs per second. | 1-10 |

## Command Mode

Interface Configuration

## Default

The default value of the max-rate is 10 PDUs per second.

## Usage

This command is to ensure that the sublayer adheres to the maximum number of OAMPDUs per second. The minimum is 1 OAMPDU per second and the maximum is 10 OAMPDUs per second.

## Examples

The following example shows how to set the OAMPDU maximum number to 10 per second:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ethernet oam max-rate 10
```

## Related Commands

show ethernet oam status

# 13.2.5 ethernet oam link-monitor on

## Command Purpose

Use this command to turn on link monitoring on an interface. Use the no form of this command to turn link monitoring off.

## Command Syntax

ethernet oam link-monitor on

no ethernet oam link-monitor on

## Command Mode

Interface Configuration

### Default

When link monitor is supported, link monitoring is automatically turned on.

### Usage

None

### Examples

The following example shows how to turn on link monitoring on interface eth-0-1:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ethernet oam link-monitor on
```

### Related Commands

show ethernet oam status

## 13.2.6 ethernet oam link-monitor supported

### Command Purpose

Use this command to configure link monitoring on an interface. Use the no form of this command to remove support for link monitoring on an interface.

### Command Syntax

ethernet oam link-monitor supported

no ethernet oam link-monitor supported

### Command Mode

Interface Configuration

### Default

The default state of the link monitor is supported

## Usage

None

## Examples

The following example shows how to configure link monitoring on interface eth-0-1:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ethernet oam link-monitor supported
```

## Related Commands

show ethernet oam status

# 13.2.7 ethernet oam link-monitor frame

## Command Purpose

Use this command to configure the low and high threshold and the window for the frame event. If the low threshold is exceeded, an error frame link event is generated. If the high threshold is exceeded, the action defined using the command ethernet oam link-monitor high threshold action is taken.

## Command Syntax

ethernet oam link-monitor frame threshold high ( *HIGH_THRES* | none ) low *LOW_THRES* window *WINDOW*

no ethernet oam link-monitor frame threshold

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| HIGH_THRES | Value of the high threshold for error frames. | 1-65535 |
| none | No high threshold value is set | - |
| low LOW_THRES | Value of the low threshold for error frames. | 0-65535 |
| window WINDOW | Size of frame event window, expressed in milliseconds | 10-600 |

### Command Mode

Interface Configuration

### Default

The default value for high threshold is none, meaning that no high threshold is configured.

The default value of low threshold is 1.

The default value for the frame event window is 100.

### Usage

None

### Examples

The following example shows how to configure the low and high threshold and the window for the frame event:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ethernet oam link-monitor frame threshold high 5 low 2 window
200
```

### Related Commands

show ethernet oam status

## 13.2.8 ethernet oam link-monitor frame-seconds threshold

### Command Purpose

Use this command to configure the low and high threshold and the window for the frame-seconds event. If the low threshold is exceeded, an error-frame-seconds link event is generated. If the high threshold is exceeded then action defined through the command ethernet oam link-monitor high threshold action will be taken.

## Command Syntax

ethernet oam link-monitor frame-seconds threshold high ( *HIGH_THRES* | none ) low *LOW_THRES* window *WINDOW*

no ethernet oam link-monitor frame-seconds threshold high

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| HIGH_THRES | High threshold for the number of error frame-seconds in the range of 1~900 | 1-900 |
| none | No high threshold value is set | - |
| low LOW_THRES | Low threshold for the number of error frame-seconds 1~900 | 1-900 |
| window WINDOW | Window for frame-seconds events, in milliseconds, in multiples of 100 | 100-9000 |

## Command Mode

Interface Configuration

## Default

The default value for high threshold is none, meaning that no high threshold is configure. The default value for the low threshold is 1. The default value of frame event window is 1000.

## Usage

None

## Examples

The following example shows how to configure the threshold and window for the frame-seconds event:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ethernet oam link-monitor frame-seconds threshold high 5 low 2
window 200
```

### Related Commands

show ethernet oam status

## 13.2.9 ethernet oam link-monitor high threshold action

### Command Purpose

Use this command to define action when high threshold is detected. Use no form of the command to reset the action.

### Command Syntax

ethernet oam link-monitor high threshold action error-disable-interface

no ethernet oam link-monitor high threshold action error-disable-interface

### Command Mode

Interface Configuration

### Default

When high threshold is exceeded it will generate only the corresponding link event and will not trigger any interface events by default

### Usage

None

### Examples

The following example shows how to define action of error-disable interface when high threshold is detected:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ethernet oam link-monitor high-threshold action error-disable-
interface
```

## Related Commands

show ethernet oam status

# 13.2.10 ethernet oam remote-loopback

## Command Purpose

Use this command to configure remote loopback on an interface. This command can be used to enable or disable remote loopback and also configure the remote loopback timeout, which is the number of seconds the DTE will wait for the remote DTE to respond to the ethernet oam remote-loopback enable command. Use the no form of this command to remove remote-loopback support from the interface.

## Command Syntax

ethernet oam remote-loopback { supported | timeout *SECS* }

no ethernet oam remote-loopback { supported | timeout }

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| supported | Remote loopback can be initiated in the DTE | - |
| timeout SECS | The remote loopback timeout value in the range of 1~10 | 1-10 seconds |

## Command Mode

Interface Configuration

## Default

The default state for the remote loopback is not supported. If a timeout is not configured, the local DTE remains in remote loopback state until the remote DTE responds or the user stops remote loopback administratively.

One switch supports 4 interfaces in "local Loopback" status at the same time.

## Usage

None

## Examples

The following example shows how to support remote-loopback on interface eth-0-1:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ethernet oam remote-loopback supported
```

## Related Commands

show ethernet oam status

# 13.2.11 ethernet oam remote-loopback start

## Command Purpose

Use this command to start an Ethernet OAM remote-loopback mechanism.

## Command Syntax

ethernet oam remote-loopback start interface *IFNAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | Name of the interface | Support physical ports |

## Command Mode

Privileged EXEC

## Default

The default state of the remote loopback function is disabled.

## Usage

This command is used to start a remote loopback mechanism.

### Examples

The following example shows how to start an Ethernet OAM remote-loopback mechanism:

```
Switch# ethernet oam remote-loopback start interface eth-0-1
```

### Related Commands

show ethernet oam state-machine

## 13.2.12 ethernet oam remote-loopback stop

### Command Purpose

Use this command to stop an Ethernet OAM remote-loopback process.

### Command Syntax

ethernet oam remote-loopback stop interface *IFNAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | Name of the interface | Support physical ports |

### Command Mode

Privileged EXEC

### Default

Use this command to stop an Ethernet OAM remote loopback mechanism.

### Usage

Use this command to stop an Ethernet OAM remote loopback mechanism.

### Examples

The following example shows how to stop an Ethernet OAM remote-loopback process:

```
Switch# ethernet oam remote-loopback stop interface eth-0-9
```

### Related Commands

show ethernet oam state-machine

## 13.2.13 ethernet oam timeout

### Command Purpose

Use this command to reset the LOCAL_LOST_LINK_TIMER and start an Ethernet OAM discovery process. Use the no form of the command to reset to the default value.

### Command Syntax

ethernet oam timeout *SECONDS*

no ethernet oam timeout

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SECONDS | The number of seconds chosen for the link-timer | 2-30 |

### Command Mode

Interface Configuration

### Default

The default value of the timeout is 5 seconds

### Usage

This command is used to start a discovery process by resetting the LOCAL_LOST_LINK_TIMER.

### Examples

The following example shows how to set the timeout to 5s:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ethernet oam timeout 5
```

### Related Commands

None

## 13.2.14 ethernet oam remote-failure

### Command Purpose

Use this command to error-disable port when get remote failure item form peer. Use the no form of the command to unset the action.

### Command Syntax

ethernet oam remote-failure ( link-fault | critical-event | dying-gasp ) action error-disable-interface

no ethernet oam remote-failure ( link-fault | critical-event | dying-gasp ) action error-disable-interface

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| link-fault | Critical Link Event | - |
| critical-event | Dying Gasp Event | - |
| dying-gasp | Link Fault Event | - |

### Command Mode

Interface Configuration

### Default

None

### Usage

This command is used to error-disable port when get remote failure item form peer.

### Examples

The following example shows how to error-disable port when get remote failure item form peer on interface eth-0-1:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ethernet oam remote-failure link-fault action error-disable-interface
```

### Related Commands

None

## 13.2.15 show ethernet oam discovery

### Command Purpose

Use this command to display the ethernet oam administrative and operation configuration for local and remote DTE

### Command Syntax

show ethernet oam discovery ( interface *IFNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| interface IFNAME | Name of the interface | Support physical ports |

### Command Mode

Privileged EXEC

### Default

None

### Usage

The following sample output from this command displays ethernet oam administrative and operation configurations for local and remote DTE

## Examples

The following example shows how to display the ethernet oam administrative and operation configuration for local and remote DTE of interface eth-0-1:

```
Switch1# show ethernet oam discovery interface eth-0-1
```

## Related Commands

None

# 13.2.16 show Ethernet oam status

## Command Purpose

Use this command to display the runtime settings of link-monitoring and general OAM operations for all interfaces or for a specific interface

## Command Syntax

show ethernet oam status ( interface *IFNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| interface IFNAME | Name of the interface | Support physical ports |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following example shows how to display the runtime settings of link-monitoring and general OAM operations of interface eth-0-1:

```
Switch# show ethernet oam status interface eth-0-1
```

### Related Commands

None

## 13.2.17 show ethernet oam state-machine

### Command Purpose

Use this command to display the state machine information.

### Command Syntax

show ethernet oam state-machine ( interface *IFNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| interface IFNAME | Name of the interface | Support physical ports |

### Command Mode

Privileged EXEC

### Default

None

### Usage

The command displays the state of the interface.

### Examples

The following example shows how to display the state machine information of eth-0-1:

```
Switch# show ethernet oam state-machine interface eth-0-1
```

### Related Commands

None

## 13.2.18 show ethernet oam statistics

### Command Purpose

Use this command to display the statistics information.

### Command Syntax

show ethernet oam statistics ( interface *IFNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| interface IFNAME | Name of the interface | Support physical ports |

### Command Mode

Privileged EXEC

### Default

None

### Usage

The command displays the statistics of the interface.

### Examples

The following example shows how to display the statistics information of eth-0-1:

```
Switch# show ethernet oam statistics interface eth-0-1
```

### Related Commands

None

# 13.3 CFM Commands

## 13.3.1 ethernet cfm enable

### Command Purpose

Use this command to enable CFM globally. Use the no parameter to disable the CFM function on the bridge.

### Command Syntax

ethernet cfm enable

no ethernet cfm enable

### Command Mode

Global Configuration

### Default

Disabled

### Usage

This command is used to enable CFM globally.

### Examples

The following example shows how to enable and disable cfm globally:

```
Switch# configure terminal
Switch(config)# ethernet cfm enable
Switch(config)# no ethernet cfm enable
```

### Related Commands

None

## 13.3.2 ethernet cfm domain level

### Command Purpose

Use this command to create an MD within which you can manage Ethernet traffic or enter cfm domain mode. Ensure you specify the level for each MD. The levels separate MDs from each other and provide different areas of functionality.

### Command Syntax

ethernet cfm domain *DOMAIN_NAME* level *LEVEL* ( format ( no-md-name | string *STRING* | dns *DNS_NAME* | mac-address *MAC_ADDRESS* ) | )

no ethernet cfm domain *DOMAIN_NAME* ( level *LEVEL* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DOMAIN_NAME | Maintenance domain name | The first character should be a-z or A-Z, character only can be 0-9A-Za-z.-_ and the max len is 43 |
| LEVEL | MD level | 0-7 |
| no-md-name | There is no md name when create maid of cfm packet | - |
| string STRING | Maintenance domain ASCII name, used to create maid of cfm packet | The first character should be a-z or A-Z, character only can be 0-9A-Za-z.-_ and the max len is 43 |
| dns DNS_NAME | Maintenance domain DNS name, used to create maid of cfm packet | The first character should be a-z or A-Z, character only can be 0-9A-Za-z.-_ and the max len is 43 |
| mac-address MAC_ADDRESS | Maintenance domain MAC-address with two octets name, used to create maid of cfm packet | MAC-address and 2-octet integer (H.H.H:U(0-65535), example:0001.0001.0001:1) |

### Command Mode

Global Configuration

## Default

None

## Usage

The valid range of MD is 0-7, the larger number indicates bigger maintenance domain.

For Y.1731 mode, domain format should be no-md-name

## Examples

The following example shows how to create and destroy domain:

```
Switch# configure terminal
Switch(config)# ethernet cfm domain test level 5
Switch(config-ether-cfm)# exit
Switch(config)# no ethernet cfm domain test
```

## Related Commands

None

# 13.3.3 service

## Command Purpose

Use this command to create an MA within which you can create mep.

## Command Syntax

service *CSI_ID* ( vlan *VLAN_ID* | format ( string *STRING* | icc-based *ICC_NAME* ) | )

no service *CSI_ID*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| CSI_ID | Maintenance association name | The first character should be a-z or A-Z, character only can be 0-9A-Za-z.-_ and the max len is 43. MD(Maintenance domain) name and MA(Maintenance association) name totally up to 44 characters. |
| vlan VLAN_ID | Vlan id | 1-4094 |
| string STRING | Maintenance association ASCII name, used to create maid of cfm packet | The first character should be a-z or A-Z, character only can be 0-9A-Za-z.-_ and the max len is 43 |
| icc-based ICC_NAME | Maintenance association icc-based name, used to create maid of cfm packet | The first character should be a-z or A-Z, character only can be 0-9A-Za-z.-_ and the max len is 13 |

## Command Mode

Ethernet-Cfm Configuration

## Default

None

## Usage

For Y.1731 mode, format should be icc-based or string

## Examples

The following example shows how to create and remove MA:

```
Switch# configure terminal
Switch(config)# ethernet cfm domain test level 5
Switch(config-ether-cfm)# service cst vlan 30
Switch(config-ether-cfm)# no service cst
```

## Related Commands

ethernet cfm domain DOMAIN_NAME level LEVEL

# 13.3.4 ethernet cfm mep

## Command Purpose

Use this command to define an MEP within an MA. Each MEP and remote MEP must have a unique ID within an MA. If two or more MEPs share the same ID, CFM raises an event indicating a duplicate MEP exists in the MA.

## Command Syntax

ethernet cfm mep ( down | up ) mpid *MEPID* domain *DOMAIN_NAME* ( vlan *VLAN_ID* | ) interval ( 1 | 2 | 3 | 4 | 5 | 6 | 7 )

no ethernet cfm mep ( down | up ) mpid *MEPID* domain *DOMAIN_NAME* ( vlan *VLAN_ID* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| down | Down mep | - |
| up | Up mep | - |
| MEPID | Local mep id | 1-8191 |
| DOMAIN_NAME | Maintenance domain name | String with up to 43 characters |
| vlan VLAN_ID | Vlan id, the range is 1 to 4094 | 1-4094 |
| 1 | CCM Interval 3.3 millisecond | - |
| 2 | CCM Interval 10 millisecond | - |
| 3 | CCM Interval 100 millisecond | - |
| 4 | CCM Interval 1 second | - |
| 5 | CCM Interval 10 second | - |
| 6 | CCM Interval 1 minute | - |
| 7 | CCM Interval 10 minutes | - |

## Command Mode

Interface Configuration

## Default

None

## Usage

None

## Examples

The following example shows how to create MEP:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ethernet cfm mep down mpid 1 domain md1 vlan 2 interval 1
```

## Related Commands

ethernet cfm domain DOMAIN_NAME level LEVEL

service CSI_ID (vlan VLAN_ID|)

# 13.3.5 ethernet cfm mep crosscheck mpid

## Command Purpose

Use this command to define a remote MEP within an MA. Each MEP and remote MEP must have a unique ID within an MA. If two or more MEPs share the same ID, CFM raises an event indicating a duplicate MEP exists in the MA.

## Command Syntax

ethernet cfm mep crosscheck mpid *MEPID* domain *DOMAIN_NAME* ( vlan *VLAN_ID* | ) ( mac *MAC* | ) ( trigger if-errdisable | )

no ethernet cfm mep crosscheck mpid *MEPID* domain *DOMAIN_NAME* ( vlan *VLAN_ID* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MEPID | The range is 1 to 8191 | 1-8191 |
| DOMAIN_NAME | Maintenance domain name | String with up to 43 characters |

| | | |
|---|---|---|
| vlan VLAN_ID | Vlan id, the range is 1 to 4094 | 1-4094 |
| MAC | Remote mep mac address | MAC Address |
| trigger if-errdisable | Trigger interface errdisable, when cc detect failure | trigger if-errdisable |

## Command Mode

Interface Configuration

## Default

None

## Usage

None

## Examples

The following example shows how to create remote MEP:

```
Switch# configure terminal
Switch(config)# ethernet cfm domain test level 5
Switch(config-ether-cfm)# service cst vlan 30
Switch(config-ether-cfm)# exit
Switch(config)# interface eth-0-9
Switch(config-if)# ethernet cfm mep crosscheck mpid 8000 domain test vlan 30 mac
0.0.1
```

## Related Commands

ethernet cfm domain DOMAIN_NAME level LEVEL

service CSI_ID (vlan VLAN_ID|)

# 13.3.6 ethernet cfm mip

## Command Purpose

Use this command to define an MIP. The relative MD and MA should be configured before MIP is configured.

## Command Syntax

ethernet cfm mip level *LEVEL* vlan *VLAN_ID*

no ethernet cfm mip level *LEVEL* vlan *VLAN_ID*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LEVEL | MD level, the range is 0 to 7 | 1-7 |
| VLAN_ID | Vlan id | 1-4094 |

## Command Mode

Interface Configuration

## Default

None

## Usage

None

## Examples

The following example shows how to create MIP:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ethernet cfm mip level 5 vlan 2
```

## Related Commands

ethernet cfm domain DOMAIN_NAME level LEVE

service CSI_ID (vlan VLAN_ID|)

# 13.3.7 ethernet cfm cc enable domain

## Command Purpose

Use the command to enable continuity check for an MA.

## Command Syntax

ethernet cfm cc enable domain *DOMAIN_NAME* ( vlan *VLAN_ID* | )

no ethernet cfm cc enable domain *DOMAIN_NAME* ( vlan *VLAN_ID* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DOMAIN_NAME | Maintenance domain name | String with up to 43 characters |
| VLAN_ID | Vlan id | 1-4094 |

## Command Mode

Global Configuration

## Default

None

## Usage

None

## Examples

The following example shows how to enable cc:

```
Switch# configure terminal
Switch(config)# ethernet cfm cc enable domain test vlan 2
```

## Related Commands

ethernet cfm domain DOMAIN_NAME level LEVEL

service CSI_ID (vlan VLAN_ID|)

# 13.3.8 ethernet cfm cc domain priority

## Command Purpose

Use the command to define continuity check vlan priority for an MA.

## Command Syntax

ethernet cfm cc domain *DOMAIN_NAME* ( vlan *VLAN_ID* | ) priority *VLAN_PRIORITY*

no ethernet cfm cc domain *DOMAIN_NAME* ( vlan *VLAN_ID* | ) priority

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DOMAIN_NAME | Maintenance domain name | String with up to 43 characters |
| VLAN_ID | Vlan id | 1-4094 |
| VLAN_PRIORITY | Vlan priority。The default value is 7。 | 0-7 |

## Command Mode

Global Configuration

## Default

None

## Usage

None

## Examples

The following example shows how to configure vlan priority for CC message:

```
Switch# configure terminal
Switch(config)# ethernet cfm cc domain test vlan 2 priority 3
```

## Related Commands

ethernet cfm domain DOMAIN_NAME level LEVEL

service CSI_ID (vlan VLAN_ID|)

ethernet cfm cc enable domain DOMAIN_NAME (vlan VLAN_ID|)

## 13.3.9 ethernet cfm loopback

### Command Purpose

Use the command to issue CFM loopback messages for remote mepid or multicast address and verify that remote MEPs are accessible.

### Command Syntax

ethernet cfm loopback ( multicast | unicast rmepid *RMEPID* ) mepid *MEPID* ( domain *DOMAIN_NAME* | level *LEVEL* ) ( vlan *VLAN_ID* | ) ( repeat *COUNT* | ) ( timeout *TIMEOUT* | ) ( priority *PRIORITY* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| multicast | Send multicast frame | - |
| unicast | Send unicast frame | - |
| RMEPID | Remote mep id | 1-8191 |
| MEPID | Source mep id | 1-8191 |
| domain DOMAIN_NAME | Maintenance domain name | String with up to 43 characters |
| level LEVEL | MD level | 0-7 |
| vlan VLAN_ID | Vlan id | 1-4094 |
| repeat COUNT | Repeat count, the default value is 1 | 1-255 |
| timeout TIMEOUT | The value of timeout, the default value is 5 | 1-65535 seconds |
| priority PRIORITY | The value of VLAN priority | 0-7 |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

## Examples

The following example shows how to start loopback:

```
Switch# ethernet cfm loopback multicast mepid 1 domain test vlan 2 repeat 3 timeout
5 priority 7
```

## Related Commands

ethernet cfm mep (down|up) mpid MEPID domain DOMAIN_NAME (vlan VLAN_ID |) interval (1 | 2 | 3 | 4 | 5 | 6 | 7)

ethernet cfm mep crosscheck mpid MEPID (vlan VLAN_ID |) mac MAC

# 13.3.10 ethernet cfm loopback mac

## Command Purpose

Use the command to issue CFM loopback messages for remote MEP or MIP mac address and verify that remote MEPs or MIPs are accessible.

## Command Syntax

ethernet cfm loopback mac *MACADDRESS* unicast mepid *MEPID* ( domain *DOMAIN_NAME* | level *LEVEL* ) ( vlan *VLAN_ID* | ) ( repeat *COUNT* | ) ( timeout *TIMEOUT* | ) ( priority *PRIORITY* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MACADDRESS | The remote mep mac address | MAC Address |
| MEPID | The source local mep id and its range is 1 to 8191 | 1-8191 |
| domain DOMAIN_NAME | Maintenance domain name | String with up to 43 characters |
| level LEVEL | MD level | 0-7 |
| vlan VLAN_ID | Vlan id | 1-4094 |
| repeat COUNT | Repeat count, the range is 1 to 255, the default value is 1 | 1-255 |
| timeout TIMEOUT | The value of timeout, the default value is 5 | 1-65535 seconds |
| priority PRIORITY | The value of VLAN priority | 0-7 |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following example shows how to start loopback:

```
Switch# ethernet cfm loopback mac 0.0.1 unicast mepid 1 domain test vlan 2 repeat 3
timeout 5 priority 7
```

### Related Commands

ethernet cfm mep (down|up) mpid MEPID domain DOMAIN_NAME (vlan VLAN_ID |) interval (1 | 2 | 3 | 4 | 5 | 6 | 7)

ethernet cfm mep crosscheck mpid MEPID (vlan VLAN_ID |) mac MAC

## 13.3.11 ethernet cfm errors enable domain

### Command Purpose

Use the command to configure reserve ccm errors. The default action is to reserve ccm errors.

### Command Syntax

ethernet cfm errors enable domain *DOMAIN_NAME* ( vlan *VLAN_ID* | )

no ethernet cfm errors enable domain *DOMAIN_NAME* ( vlan *VLAN_ID* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DOMAIN_NAME | Maintenance domain name | String with up to 43 characters |

| | | |
|---|---|---|
| vlan VLAN_ID | Vlan id | 1-4094 |

## Command Mode

Global Configuration

## Default

None

## Usage

For every mep, five latest errors will be reserved.

## Examples

The following example shows how to configure reserve ccm errors:

```
Switch# configure terminal
Switch(config)# ethernet cfm errors enable domain test vlan 2
```

## Related Commands

None

# 13.3.12 clear ethernet cfm errors

## Command Purpose

Use the command to clear cfm errors for domain.

## Command Syntax

clear ethernet cfm errors ( domain *DOMAIN_NAME* | level *LEVEL* )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| domain DOMAIN_NAME | Maintenance domain name | String with up to 43 characters |
| level LEVEL | MD level | 0-7 |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following example shows how to clear ccm errors:

```
Switch# clear ethernet cfm errors domain test
```

## Related Commands

None

# 13.3.13 ethernet cfm ais status enable

## Command Purpose

Use the command to enable or disable ais function and configure relative parameters.

## Command Syntax

ethernet cfm ais status enable ( all | loc | mismerge | unexpected-mep | unexpected-meg-level | unexpected-period ) domain *DOMAIN_NAME* ( vlan *VLAN_ID* | )

level *LEVEL* ( unicast *RMEP_MAC* | multicast ) ( cvlan *VLAN_LIST* | )

no ethernet cfm ais status enable ( all | loc | mismerge | unexpected-mep | unexpected-meg-level | unexpected-period ) domain *DOMAIN_NAME* ( vlan *VLAN_ID* | )

level *LEVEL* ( unicast *RMEP_MAC* | multicast )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| all | Ais for all defect condition | - |
| loc | Ais for loss of continuity | - |
| mismerge | Ais for incorrect MEG ID | - |
| unexpected-mep | Ais for unexpected MEP ID received | - |
| unexpected-meg-level | Ais for incorrect MEG level | - |
| unexpected-period | Ais for mis-matched in period received | - |
| DOMAIN_NAME | Maintenance domain name of the local mep | String with up to 43 characters |
| vlan VLAN_ID | Vlan id | 1-4094 |
| LEVEL | Ais packet will be sent in this MD level | 1-7 |
| unicast | Unicast ais frame to be sent | - |
| RMEP_MAC | The remote mep mac address | - |
| multicast | Multicast ais frame to be sent | - |
| cvlan VLAN_LIST | Cvlan id of ais packet | 1-4094 |

## Command Mode

Interface Configuration

## Default

None

## Usage

None

## Examples

The following example shows how to configure ais:

```
Switch# configure terminal
Switch(config)# ethernet cfm ais status enable all domain test vlan 2 level 5
multicast
```

## Related Commands

None

# 13.3.14 ethernet cfm ais suppress alarm enable domain

## Command Purpose

Use the command to enable ais suppress alarm. When this command is configured and ais condition is enabled, the loc errors will not be reported.

## Command Syntax

ethernet cfm ais suppress alarm enable domain *DOMAIN_NAME* ( vlan *VLAN_ID* | )

no ethernet cfm ais suppress alarm enable domain *DOMAIN_NAME* ( vlan *VLAN_ID* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DOMAIN_NAME | Maintenance domain name of the local mep | String with up to 43 characters |
| vlan VLAN_ID | Vlan id | 1-4094 |

## Command Mode

Global Configuration

## Default

None

## Usage

None

## Examples

The following example shows how to enable ais suppress alarm:

```
Switch# configure terminal
Switch(config)# ethernet cfm ais suppress alarm enable domain test vlan 2
```

## Related Commands

None

# 13.3.15 ethernet cfm server-ais status enable level

## Command Purpose

Use this command to configure ais server and parameters.

## Command Syntax

ethernet cfm server-ais status enable level *LEVEL* ( interval ( 1 | 60 ) )

no ethernet cfm server-ais status enable

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LEVEL | Ais packet will be sent in this MD level | 1-7 |
| interval (1\|60) | Transmission interval for AIS frames, the default value is 1 second | 1-60 seconds |

## Command Mode

Interface Configuration

## Default

None

## Usage

None

## Examples

The following example shows how to configure ais server:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ethernet cfm server-ais status enable level 5 interval 60
```

## Related Commands

None

# 13.3.16 show ethernet cfm domain

## Command Purpose

Use the command to display information related to the configuration of MDs and MAs.

## Command Syntax

show ethernet cfm domain *DOMAIN_NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DOMAIN_NAME | Maintenance domain name | String with up to 43 characters |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following example shows how to display information related to the configuration of MDs and Mas:

```
Switch# show ethernet cfm domain test
```

## Related Commands

None

## 13.3.17 show ethernet cfm maintenance-points

### Command Purpose

Use the command to display information related to configuration of MEPs, remote MEPs, and MIPs.

### Command Syntax

show ethernet cfm maintenance-points

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following example shows how to display information related to configuration of MEPs, remote MEPs, and MIPs:

```
Switch# show ethernet cfm maintenance-points
```

### Related Commands

None

## 13.3.18 show ethernet cfm maintenance-points local

### Command Purpose

Use the command to display information related to configuration of MEPs and MIPs.

## Command Syntax

show ethernet cfm maintenance-points local ( mep | mip ) ( interface *IFNAME* | domain *DOMAIN_NAME* | level *LEVEL* )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| mep | Maintenance end point | - |
| mip | Maintenance intermediate point | - |
| interface IFNAME | Interface name | Support physical ports |
| domain DOMAIN_NAME | Maintenance domain name | String with up to 43 characters |
| level LEVEL | MD level | 0-7 |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following example shows how to display information related to configuration of MEPs and MIPs:

```
Switch# show ethernet cfm maintenance-points local mep interface eth-0-1
```

## Related Commands

None

# 13.3.19 show ethernet cfm maintenance-points remote

## Command Purpose

Use the command to display information related to configuration of remote MEPs.

## Command Syntax

show ethernet cfm maintenance-points remote ( mpid *MEPID* | mac *MAC* | ) ( domain *DOMAIN_NAME* | level *LEVEL* ) ( vlan *VLAN_ID* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| mpid MEPID | The remote mep id | 1-8191 |
| mac MAC | The remote mep mac address | MAC Address |
| domain DOMAIN_NAME | Maintenance domain name | String with up to 43 characters |
| level LEVEL | MD level, the range is 0 to 7 | 0-7 |
| vlan VLAN_ID | Vlan id | 1-4094 |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following example shows how to display information of remote MEP:

```
Switch# show ethernet cfm maintenance-points remote mpid 1 domain test
```

### Related Commands

None

## 13.3.20 show ethernet cfm cc config

### Command Purpose

Use the command to display information related to CC configuration.

### Command Syntax

show ethernet cfm cc config

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following example shows how to display information related to CC configuration:

```
Switch# show ethernet cfm cc config
```

### Related Commands

None

# 13.3.21 show ethernet cfm errors

## Command Purpose

Use the command to display CFM error.

## Command Syntax

show ethernet cfm errors ( domain *DOMAIN_NAME* | level *LEVEL* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| domain DOMAIN_NAME | Maintenance domain name | String with up to 43 characters |
| level LEVEL | MD level, the range is 0 to 7 | 0-7 |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following example shows how to display CFM error:

```
Switch# show ethernet cfm errors
```

## Related Commands

None

## 13.3.22 show ethernet cfm ais mep

### Command Purpose

Use the command to display ais configuration for local mep.

### Command Syntax

show ethernet cfm ais mep *MEPID* domain *DOMAIN_NAME* ( vlan *VLAN_ID* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MEPID | Local mep id, the range is 1 to 8191 | 1-8191 |
| DOMAIN_NAME | Maintenance domain name | String with up to 43 characters |
| vlan VLAN_ID | Vlan id | 1-4094 |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following example shows how to display ais configuration for local mep:

```
Switch# show ethernet cfm ais mep 1 domain test vlan 2
```

### Related Commands

None

## 13.3.23 show ethernet cfm

### Command Purpose

Use the command to display cfm global information.

### Command Syntax

show ethernet cfm

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following example shows how to cfm global information:

```
Switch# show ethernet cfm
```

### Related Commands

None

## 13.3.24 ethernet cfm linktrace rmepid

### Command Purpose

Use the command to issue CFM linktrace messages for remote mep and discovery a path to remote mep.

## Command Syntax

ethernet cfm linktrace rmepid *RMEPID* ( domain *DOMAIN_NAME* | level *LEVEL* ) ( vlan *VLAN_ID* | ) ( ttl *TTL* | timeout *TIMEOUT* | priority *PRIORITY* | ltm-egress-identifier-tlv | sender-id-tlv | organization-specific-tlv )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| RMEPID | Remote mep id | 1-8191 |
| MEPID | The source local mep id | 1-8191 |
| domain DOMAIN_NAME | Maintenance domain name | String with up to 43 characters |
| level LEVEL | MD level, the range is 0 to 7 | 0-7 |
| vlan VLAN_ID | Vlan id | 1-4094 |
| ttl TTL | Maximum hops, the default value is 64 | 1-255 |
| timeout TIMEOUT | The value of timeout, the default value is 5 | 1-65535 |
| priority PRIORITY | Vlan priority, the default value is 7 | 0-7 |
| ltm-egress-identifier-tlv | LTM egress identifier TLV | - |
| sender-id-tlv | Sender ID TLV | - |
| organization-specific-tlv | Organization Specific TLV | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following example shows how to start linktrace:

```
Switch# ethernet cfm linktrace rmepid 1 mepid 2 domain test vlan 2 ttl 255 timeout 5 priority 7
```

## Related Commands

ethernet cfm mep (down|up) mpid MEPID domain DOMAIN_NAME (vlan VLAN_ID |) interval (1 | 2 | 3 | 4 | 5 | 6 | 7)

ethernet cfm mep crosscheck mpid MEPID (vlan VLAN_ID |) (mac MAC|)

# 13.3.25 ethernet cfm linktrace mac

## Command Purpose

Use the command to issue CFM linktrace messages for remote mep or mip mac address and discovery a path to remote mep or mip.

## Command Syntax

ethernet cfm linktrace mac *MACADDRESS* mepid *MEPID* ( domain *DOMAIN_NAME* | level *LEVEL* ) ( vlan *VLAN_ID* | ) ( ttl *TTL* | timeout *TIMEOUT* | priority *PRIORITY* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MACADDRESS | The remote mep mac address | MAC Address |
| MEPID | The source local mep id | 1-8191 |
| domain DOMAIN_NAME | Maintenance domain name | String with up to 43 characters |
| level LEVEL | MD level, the range is 0 to 7 | 0-7 |
| VLAN_ID | Vlan id | 1-4094 |
| ttl TTL | Maximum hops, the default value is 64 | 1-255 |
| timeout TIMEOUT | The value of timeout, the default value is 5 | 1-65535 |
| priority PRIORITY | Vlan priority, the default value is 7 | 0-7 |

## Command Mode

Privileged EXEC

## Default

None

### Usage

None

### Examples

The following example shows how to start linktrace:

```
Switch# ethernet cfm linktrace mac 7234.ef5a.2806 mepid 1 domain test vlan 2 ttl
255 timeout 5 priority 7
```

### Related Commands

ethernet cfm mep (down|up) mpid MEPID domain DOMAIN_NAME (vlan VLAN_ID |) interval (1 | 2 | 3 | 4 | 5 | 6 | 7)

ethernet cfm mep crosscheck mpid MEPID (vlan VLAN_ID |) (mac MAC|)

## 13.3.26 ethernet cfm linktrace cache enable

### Command Purpose

Use the command to configure caching linktrace information. The default value is disabled.

### Command Syntax

ethernet cfm linktrace cache enable

no ethernet cfm linktrace cache enable

### Command Mode

Global Configuration

### Default

Disabled

### Usage

None

## Examples

The following example shows how to configure caching linktrace information:

```
Switch# configure terminal
Switch(config)# ethernet cfm linktrace cache enable
```

## Related Commands

None

# 13.3.27 ethernet cfm linktrace cache size

## Command Purpose

Use the command to configure linktrace cache size.

## Command Syntax

ethernet cfm linktrace cache size *ENTRIES*

no ethernet cfm linktrace cache size

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ENTRIES | Cache entry number, the default value is 100 | 1-65535 |

## Command Mode

Global Configuration

## Default

100

## Usage

None

## Examples

The following example shows how to configure linktrace cache size:

```
Switch# configure terminal
Switch(config)# ethernet cfm linktrace cache size 200
```

### Related Commands

None

## 13.3.28 ethernet cfm linktrace cache holdtime

### Command Purpose

Use the command to configure linktrace cache hold time.

### Command Syntax

ethernet cfm linktrace cache holdtime *MINUTES*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MINUTES | Cache entry hold time minutes, the default value is 60 minutes | 1-65535 minutes |

### Command Mode

Global Configuration

### Default

60 minutes

### Usage

None

### Examples

The following example shows how to configure linktrace cache hold time:

```
Switch# configure terminal
Switch(config)# ethernet cfm linktrace cache holdtime 90
```

### Related Commands

None

## 13.3.29 show ethernet cfm linktrace cache

### Command Purpose

Use the command to display linktrace cache entries.

### Command Syntax

show ethernet cfm linktrace cache

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following example shows how to display linktrace cache entries:

```
Switch# configure terminal
Switch(config)# ethernet cfm linktrace cache holdtime 90
```

### Related Commands

None

## 13.3.30 clear ethernet cfm linktrace cache

### Command Purpose

Use the command to clear linktrace cache.

### Command Syntax

clear ethernet cfm linktrace cache

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following example shows how to clear linktrace cache:

```
Switch# show ethernet cfm linktrace cache
```

### Related Commands

None

## 13.3.31 ethernet cfm mip ccm-database size

### Command Purpose

Use the command to configure mip ccm database size.

## Command Syntax

ethernet cfm mip ccm-database size *ENTRIES*

no ethernet cfm mip ccm-database size

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ENTRIES | Cache entry number, the range is 1 to 65535, the default value is 100 | 1-65535 |

## Command Mode

Global Configuration

## Default

100

## Usage

None

## Examples

The following example shows how to configure mip ccm database size:

```
Switch# configure terminal
Switch(config)# ethernet cfm mip ccm-database size 200
```

## Related Commands

None

# 13.3.32 ethernet cfm mip ccm-database holdtime

## Command Purpose

Use the command to configure mip ccm-database hold time.

## Command Syntax

ethernet cfm mip ccm-database holdtime *MINUTES*

no ethernet cfm mip ccm-database holdtime

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MINUTES | Mip ccm database hold time minutes, the range is 60 to 65535 minutes, the default value is 60 minutes | 1-65535 minutes |

## Command Mode

Global Configuration

## Default

60 minutes

## Usage

None

## Examples

The following example shows how to configure mip ccm-database hold time:

```
Switch# configure terminal
Switch(config)# ethernet cfm mip ccm-database holdtime 90
```

## Related Commands

None

# 13.3.33 show ethernet cfm mip ccm-database

## Command Purpose

Use the command to display mip ccm-database.

### Command Syntax

show ethernet cfm mip ccm-database

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following example shows how to display mip ccm-database:

```
Switch# show ethernet cfm mip ccm-database
```

### Related Commands

None

## 13.3.34 clear ethernet cfm mip ccm-database

### Command Purpose

Use the command to clear mip ccm database.

### Command Syntax

clear ethernet cfm mip ccm-database

### Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following example shows how to clear mip ccm database:

```
Switch# clear ethernet cfm mip ccm-database
```

## Related Commands

None

# 13.3.35 ethernet cfm sf-reason

## Command Purpose

Use the command to configure signal fail reasons and these reasons will trigger g8031/g8032.

## Command Syntax

ethernet cfm sf-reason ( all | { loc | rdi-rx | ais-defect } | none )

no *Ethernet* cfm sf-reason

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| all | Configure all reasons to trigger Signal Fail | - |
| loc | Configure loc to trigger Signal Fail | - |
| rdi-rx | Configure remote mep rdi to trigger Signal Fail | - |
| ais-defect | Configure ais condition to trigger Signal Fail | - |
| none | Configure none reason | - |

## Command Mode

Global Configuration

## Default

The default value of sf-reason is Loc

## Usage

None

## Examples

The following example shows how to configure signal fail reasons:

```
Switch# configure terminal
Switch(config)# ethernet cfm sf-reason all
```

## Related Commands

None

# 13.3.36 ethernet cfm mode

## Command Purpose

Use this command to configure cfm mode globally. Use the no parameter to configure cfm mode to 802.1ag.

## Command Syntax

ethernet cfm mode ( dot1ag | y1731 )

no ethernet cfm mode

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| dot1ag | IEEE 802.1ag-2007 | - |
| y1731 | ITU-T Y.1731 | - |

## Command Mode

Global Configuration

## Default

IEEE 802.1ag-2007

## Usage

None

## Examples

The following example shows how to configure cfm mode globally:

```
Switch# configure terminal
Switch(config)# ethernet cfm mode dot1ag
Switch(config)# no ethernet cfm mode
```

## Related Commands

None

# 13.3.37 ethernet cfm raw-vlan

## Command Purpose

Use this command to configure cfm raw-vlan mode globally. Use the no parameter to configure cfm mode to non-raw-vlan mode.

## Command Syntax

ethernet cfm raw-vlan

no ethernet cfm raw-vlan

## Command Mode

Global Configuration

## Default

None

## Usage

None

## Examples

The following example shows how to configure cfm raw-vlan mode globally:

```
Switch# configure terminal
Switch(config)# ethernet cfm raw-vlan
Switch(config)# no ethernet cfm raw-vlan
```

## Related Commands

None

# 13.3.38 ethernet cfm lm enable dual-ended

## Command Purpose

Use this command to enable dual-ended loss measurement.

## Command Syntax

ethernet cfm lm enable dual-ended ( domain *DOMAIN_NAME* | level *LEVEL* ) ( vlan *VLAN_ID* | ) mepid *MEPID* ( all-cos | per-cos | cos *COS_VALUE* ) ( stats-interval *INTERVAL_VALUE* | ) ( cache-size *CACHE_VALUE* | )

no ethernet cfm lm enable dual-ended ( domain *DOMAIN_NAME* | level *LEVEL* ) ( vlan *VLAN_ID* | ) mepid *MEPID*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DOMAIN_NAME | Maintenance domain name | String with up to 43 characters |
| LEVEL | MD leve | 0-7 |
| VLAN_ID | Vlan id | 1-4094 |
| MEPID | Local mep id | 1-8191 |

| | | |
|---|---|---|
| all-cos | All packets with different cos will be counted together | - |
| per-cos | Packets with different cos will be counted separately | - |
| cos COS_VALUE | Packets with specified cos will be counted. | 0-7 |
| stats-interval INTERVAL_VALUE | After an interval, system will get counter values and calculate frame loss and frame loss ratio for near end and far end.<br>After an interval, system will get counter values and calculate frame loss and frame loss ratio for near end and far end.<br>The range is 1 to 10, unit is second, and the default value is 1. | 1-10 seconds |
| cache-size<br>cache-size CACHE_VALUE | Cache entry number for lm results.<br>Cache entry number for lm results.<br>The default value is 128. | 1-512 |

## Command Mode

Global Configuration

## Default

None

## Usage

None

## Examples

The following example shows how to enable dual-ended loss measurement:

```
Switch# configure terminal
Switch(config)# ethernet cfm lm enable dual-ended domain md1 vlan 2 mepid 1 all-cos
stats-interval 1 cache-count 256
```

## Related Commands

None

# 13.3.39 ethernet cfm lm enable single-ended

## Command Purpose

Use this command to enable single-ended loss measurement.

## Command Syntax

ethernet cfm lm enable single-ended ( domain *DOMAIN_NAME* | level *LEVEL* ) ( vlan *VLAN_ID* | ) mepid *MEPID* ( all-cos | per-cos | cos *COS_VALUE* )

no ethernet cfm lm enable single-ended ( domain *DOMAIN_NAME* | level *LEVEL* ) ( vlan *VLAN_ID* | ) mepid *MEPID*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DOMAIN_NAME | Maintenance domain name | String with up to 43 characters |
| LEVEL | MD leve | 0-7 |
| VLAN_ID | Vlan id | 1-4094 |
| MEPID | Local mep id | 1-8191 |
| all-cos | All packets with different cos will be counted together | - |
| per-cos | Packets with different cos will be counted separately | - |
| cos COS_VALUE | Packets with specified cos will be counted. | 0-7 |

## Command Mode

Global Configuration

## Default

None

## Usage

None

## Examples

The following example shows how to enable single-ended loss measurement:

```
Switch# configure terminal
Switch(config)# ethernet cfm lm enable single-ended domain md1 vlan 2 mepid 1 all-cos
```

## Related Commands

None

# 13.3.40 ethernet cfm lm single-ended

## Command Purpose

Use the command to issue CFM single-ended loss message messages.

## Command Syntax

ethernet cfm lm single-ended ( domain *DOMAIN_NAME* | level *LEVEL* ) ( vlan *VLAN_ID* | ) rmepid *RMEPID* mepid *MEPID* ( count *COUNT* | ) ( interval ( 1 | 2 | 3 | ) | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DOMAIN_NAME | Maintenance domain name | - |
| LEVEL | MD leve | 0-7 |
| VLAN_ID | Vlan id | 1-4094 |
| RMEPID | Remote mep id | 1-8191 |
| MEPID | Local mep id | 1-8191 |
| count COUNT | Repeat count, the default value is 2 | 2-60 |
| interval | LM Transmission interval, default value is 1 second. | - |
| 1 | LM Interval, 100 milliseconds | - |
| 2 | LM Interval, 1 second | - |
| 3 | LM Interval, 10 seconds | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following example shows how to issue CFM single-ended loss message messages:

```
Switch# ethernet cfm lm single-ended domain md1 vlan 2 rmepid 2 mepid 1 count 10
interval 1
```

## Related Commands

None

# 13.3.41 show ethernet cfm lm

## Command Purpose

Use the command to display dual-ended loss measurement results.

## Command Syntax

show ethernet cfm lm domain *DOMAIN_NAME* ( vlan *VLAN_ID* | ) mepid *MEPID* ( cos *COS_VALUE* )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DOMAIN_NAME | Maintenance domain name | String with up to 43 characters |
| VLAN_ID | Vlan id | 1-4094 |
| MEPID | Local mep id | 1-8191 |

| | | |
|---|---|---|
| cos COS_VALUE | Display lm result for specified cos.<br>Display lm result for specified cos.<br>The default value is 0 | 0-7 |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following example shows how to display dual-ended lm results:

```
Switch# show ethernet cfm lm domain md1 vlan 2 mepid 3
DOMAIN     : md1
VLAN       : 2
MEPID      : 1
Start Time : 2013/07/15 9:00:09
End Time   : 2013/07/15 9:00:09
Notes      : 1. When the difference of Tx is less than the difference of Rx,
                the node is invalid, loss and loss ratio should be "-";
             2. When loc is reported for mep, the loss should be "-" and loss
                ratio should be 100%;
             3. When calculate average loss and loss ratio, invalid or loc nodes
                will be excluded;
Latest dual-ended loss statistics:
--------------------------------------------------------------------------------
Index Cos Local-loss Local-loss ratio Remote-loss Remote-loss ratio Time
--------------------------------------------------------------------------------
1     all          4        050.0000%           4         050.0000% 09:00:09
2     all          -                -           -                 - 09:00:09
3     all          0        000.0000%         100         100.0000% 09:00:09
4     all          0        000.0000%          99         099.0000% 09:00:09
5     all          0        000.0000%          90         090.0000% 09:00:09
6     all          0        000.0000%           1         001.0000% 09:00:09
7     all          0        000.0000%           0         000.0000% 09:00:09
8     all          -                -           -                 - 09:00:09
9     all          0        000.0000%  4294967039         099.9999% 09:00:09
10    all          0        000.0000%         510         099.8043% 09:00:09
11    all          -        100.0000%           -         100.0000% 09:00:09
```

```
12    all          0        000.0000%           0         000.0000% 09:00:09
13    all          4        050.0000%           4         050.0000% 09:00:09
14    all          4        050.0000%           4         050.0000% 09:00:09
-------------------------------------------------------------------------------
Maximum Local-loss  : 4          Maximum Local-loss Ratio  : 100.0000%
Minimum Local-loss  : 0          Minimum Local-loss Ratio  : 000.0000%
Average Local-loss  : 1          Average Local-loss Ratio  : 013.6363%
Maximum Remote-loss : 4294967039 Maximum Remote-loss Ratio : 100.0000%
Minimum Remote-loss : 0          Minimum Remote-loss Ratio : 000.0000%
Average Remote-loss : 390451622  Average Remote-loss Ratio : 058.1640%
```

## Related Commands

None

# 13.3.42 ethernet cfm sd-reason

## Command Purpose

Use the command to configure signal defect reasons. If dual-lm loss ration is greater than limit, log will be printed and trap will be reported.

## Command Syntax

ethernet cfm sd-reason ( domain *DOMAIN_NAME* | level *LEVEL* ) ( vlan *VLAN_ID* | ) mepid *MEPID* ratio *RATIO_VALUE*

no ethernet cfm sd-reason ( domain *DOMAIN_NAME* | level *LEVEL* ) ( vlan *VLAN_ID* | ) mepid *MEPID*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DOMAIN_NAME | Maintenance domain name | String with up to 43 characters |
| LEVEL | MD level | 0-7 |
| VLAN_ID | Vlan id | 1-4094 |
| MEPID | Local mep id | 1-8191 |
| RATIO_VALUE | Dual-lm loss ratio limitation, the range is 1 to 1000, unit is one in a thousand, | 1-1000 |

## Command Mode

Global Configuration

## Default

None

## Usage

None

## Examples

The following example shows how to enable sd-reason:

```
Switch# configure terminal
Switch(config)# ethernet cfm sd-reason domain md1 vlan 2 mepid 1 ratio 100
```

## Related Commands

None

# 13.3.43 ethernet cfm (1dm | dmm)

## Command Purpose

Use the command to issue CFM 1dm or dmm messages for remote mepid, receive dmr from remote mep, calculate and display frame delay.

## Command Syntax

ethernet cfm ( 1dm | dmm ) rmepid *RMEPID* mepid *MEPID* count *COUNT* ( domain *DOMAIN_NAME* | level *LEVEL* ) ( vlan *VLAN_ID* | ) ( priority *PRIORITY* | interval ( 1 | 2 | 3 | ) ) ( *frame_size SIZE* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| RMEPID | Remote mep id | 1-8191 |
| MEPID | Local mep id | 1-8191 |
| COUNT | Repeat count | 1-60 |
| DOMAIN_NAME | Maintenance domain name | String with up to 43 characters |
| VLAN_ID | Vlan id | 1-4094 |
| LEVEL | MD level | 0-7 |

| | | |
|---|---|---|
| priority PRIORITY | Vlan priority, the default value is 7 | 0-7 |
| interval | DM Transmission interval, default value is 1 second. | - |
| 1 | DM Interval, 100 milliseconds | - |
| 2 | DM Interval, 1 second | - |
| 3 | DM Interval, 10 seconds | - |
| frame_size SIZE | The range of SIZE should be 64 bytes to 9600 bytes, the default value is 64 bytes; | 64-9600 bytes |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following example shows how to issue CFM 1dm or dmm messages:

```
Switch# ethernet cfm dmm rmepid 1 mepid 2 count 5 domain md1 vlan 2 priority 3
interval 1
```

## Related Commands

None

# 13.3.44 ethernet cfm (1dm | dmm) continual

## Command Purpose

Use the command to issue CFM 1dm or dmm messages for remote mepid periodically, receive dmr from remote mep, calculate and display frame delay.

## Command Syntax

ethernet cfm ( 1dm | dmm ) continual rmepid *RMEPID* mepid *MEPID* ( domain *DOMAIN_NAME* | level *LEVEL* ) ( vlan *VLAN_ID* | ) ( priority *PRIORITY* | interval ( 1 | 2 | 3 | 4 | 5 | ) ) ( *frame_size SIZE* | )

no ethernet cfm ( 1dm | dmm ) continual rmepid *RMEPID* mepid *MEPID* ( domain *DOMAIN_NAME* | level *LEVEL* ) ( vlan *VLAN_ID* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| RMEPID | Remote mep id | 1-8191 |
| MEPID | Local mep id | 1-8191 |
| DOMAIN_NAME | Maintenance domain name | String with up to 43 characters |
| VLAN_ID | Vlan id | 1-4094 |
| LEVEL | MD level | 0-7 |
| priority PRIORITY | Vlan priority, the default value is 7 | 0-7 |
| interval | DM Transmission interval, default value is 30 seconds. | - |
| 1 | DM Interval, 100 milliseconds | - |
| 2 | DM Interval, 1 second | - |
| 3 | DM Interval, 10 seconds | - |
| 4 | DM Interval, 30 seconds | - |
| 5 | DM Interval, 60 seconds | - |
| frame_size SIZE | The range of SIZE should be 64 bytes to 9600 bytes, the default value is 64 bytes; | 64-9600 bytes |

## Command Mode

Interface Configuration

## Default

None

## Usage

None

## Examples

The following example shows how to issue CFM 1dm or dmm messages periodically:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ethernet cfm dmm continual rmepid 1 mepid 2 domain md1 vlan 2
priority 3 interval 1
```

## Related Commands

show ethernet cfm dmm continual mepid MEPID (domain DOMAIN_NAME | level LEVEL) (vlan VLAN_ID |)

# 13.3.45 show ethernet cfm dmm continual

## Command Purpose

Use the command to display continual delaymeasurement statistics.

## Command Syntax

show ethernet cfm dmm continual ( ( rmepid *RMEPID* mepid *MEPID* ( domain *DOMAIN_NAME* | level *LEVEL* ) ( vlan *VLAN_ID* | ) ) | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| RMEPID | Remote mep id | 1-8191 |
| MEPID | Local mep id | 1-8191 |
| DOMAIN_NAME | Maintenance domain name | String with up to 43 characters |
| VLAN_ID | Vlan id | 1-4094 |
| LEVEL | MD level | 0-7 |

## Command Mode

Privileged EXEC

## Default

None

### Usage

None

### Examples

The following example shows how to display continual delaymeasurement statistics:

```
Switch# show ethernet cfm dmm continual
```

### Related Commands

None

## 13.3.46 ethernet cfm delaymeasurement cache enable

### Command Purpose

Use the command to configure caching delaymeasurement information. The default value is enabled.

### Command Syntax

ethernet cfm delaymeasurement cache enable

no ethernet cfm delaymeasurement cache enable

### Command Mode

Global Configuration

### Default

Enabled

### Usage

None

## Examples

The following example shows how to configure delaymeasurement cache enable:

```
Switch# configure terminal
Switch(config)# ethernet cfm delaymeasurement cache enable
```

## Related Commands

None

# 13.3.47 ethernet cfm delaymeasurement cache size

## Command Purpose

Use the command to configure delaymeasurement cache size.

## Command Syntax

ethernet cfm delaymeasurement cache size *ENTRIES*

no *Ethernet* cfm delaymeasurement cache size

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ENTRIES | Cache entry number, the default value is 1000 | 1-65535 |

## Command Mode

Global Configuration

## Default

1000

## Usage

None

## Examples

The following example shows how to configure delaymeasurement cache size:

```
Switch# configure terminal
Switch(config)# ethernet cfm delaymeasurement cache size 100
```

### Related Commands

None

## 13.3.48 show ethernet cfm delaymeasurement cache

### Command Purpose

Use the command to display delaymeasurement cache entries.

### Command Syntax

show ethernet cfm delaymeasurement cache

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following example shows how to display delaymeasurement cache entries:

```
Switch# show ethernet cfm delaymeasurement cache
```

### Related Commands

None

## 13.3.49 clear ethernet cfm delaymeasurement cache

### Command Purpose

Use the command to clear delaymeasurement cache entries.

### Command Syntax

clear ethernet cfm delaymeasurement cache

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following example shows how to clear delaymeasurement cache entries:

```
Switch# clear ethernet cfm delaymeasurement cache
```

### Related Commands

None

## 13.3.50 ethernet cfm csf

### Command Purpose

Use this command to configure CSF(client signal fail) relation between client mep and server mep.

## Command Syntax

ethernet cfm csf client domain *CLI_DOMAIN_NAME* ( vlan *CLI_VLAN_ID* | ) mepid *CLI_MEPID* server domain *SRV_DOMAIN_NAME* ( vlan *SRV_VLAN_ID* | ) mepid *SRV_MEPID* ( tx-interval ( 1 | 60 ) | )

no ethernet cfm csf client domain *CLI_DOMAIN_NAME* ( vlan *CLI_VLAN_ID* | ) mepid *CLI_MEPID* server domain *SRV_DOMAIN_NAME* ( vlan *SRV_VLAN_ID* | ) mepid *SRV_MEPID*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| CLI_DOMAIN_NAME | Client maintenance domain name | String with up to 43 characters |
| vlan CLI_VLAN_ID | Client vlan id | 1-4094 |
| CLI_MEPID | Client local mep id | 1-8191 |
| SRV_DOMAIN_NAME | Server maintenance domain name | String with up to 43 characters |
| vlan SRV_VLAN_ID | Server vlan id | 1-4094 |
| SRV_MEPID | Server local mep id | 1-8191 |
| tx-interval (1\|60) | Transmission interval of csf message, the default value is 60 seconds | 1 or 60 seconds |

## Command Mode

Global Configuration

## Default

None

## Usage

None

## Examples

The following example shows how to configure CSF relation:

```
Switch# configure terminal
Switch(config)# ethernet cfm csf client domain cust vlan 30 mepid 88 server domain
provid vlan 20 mepid 666 tx-interval 1
```

### Related Commands

None

## 13.3.51 show ethernet cfm csf

### Command Purpose

Use the command to display csf relation and status.

### Command Syntax

show ethernet cfm csf

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following example shows how to display csf:

```
Switch# show ethernet cfm csf
CTR-Client Trigger reason, L(los)/F(fdi)/R(rdi)/N(null)
ECC-Enter CSF Condition, Y(Yes)/N(No)
SRR-Server Rx Reason, L(los)/F(fdi)/R(rdi)/D(dci)/N(null)
Tx-I, Transmit Interval
Rx-I, The period which is gotten from LCK packets
Client Mep                              Server Mep
MPID Cli-Domain    VLAN  CTR    ECC MPID Srv-Domain    VLAN SRR    Tx-I Rx-I
1003 md1234567890 3001 L/F/R  Y    1004  md1234567890 2001 L/F/R 1     1
```

### Related Commands

None

# 13.3.52 ethernet cfm lck enable

## Command Purpose

Use this command to lock data packets for mep.

## Command Syntax

ethernet cfm lck enable mep *MEPID* domain *DOMAIN_NAME* ( vlan *VLAN_ID* | ) tx-level *TX_LEVEL* ( { tx-interval ( 1 | 60 ) | cvlan *VLAN_LIST* } | )

no ethernet cfm lck enable mep *MEPID* domain *DOMAIN_NAME* ( vlan *VLAN_ID* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DOMAIN_NAME | Maintenance domain name | String with up to 43 characters |
| vlan VLAN_ID | Vlan id | 1-4094 |
| MEPID | Local mep id | 1-8191 |
| TX_LEVEL | Transmission level of lck message | 0-7 |
| tx-interval (1\|60) | Transmission interval of lck message, the default value is 60 seconds | 1 or 60 seconds |
| cvlan VLAN_LIST | Cvlan id of lck packet | 1-4094 |

## Command Mode

Interface Configuration

## Default

None

## Usage

None

## Examples

The following example shows how to enable lock data packets for mep:

```
Switch# configure terminal
Switch(config)# ethernet cfm lck enable domain md1 vlan 2 mepid 1 tx-level 5 tx-
interval 1
```

### Related Commands

None

## 13.3.53 show ethernet cfm lck

### Command Purpose

Use the command to display lck information.

### Command Syntax

show ethernet cfm lck

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following example shows how to display lck information:

```
Switch# show ethernet cfm lck
En-LCK Enable, Y(Yes)/N(No)
Rx-LC, Receive LCK packets and enter LCK condition, Y(Yes)/N(No)
Rx-I, The period which is gotten from LCK packets
Tx-Domain, frames with ETH-LCK information are sent to this Domain
Tx-I, Transmit Interval
MPID Domain          VLAN En Rx-LC Rx-I Tx-Domain     Tx-I
1001  md1234567890  3001 Y  N       N/A md1234567891 1
```

### Related Commands

None

## 13.3.54 show ethernet cfm lm brief

### Command Purpose

Use the command to display all meps which are enabled loss measurement.

### Command Syntax

show ethernet cfm lm brief

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following example shows how to display lm brief information:

```
Switch#  show ethernet cfm lm brief
-----------------------------------------
MPID Domain      VLAN LM-En
-----------------------------------------
1    md1          2    dual-lm-enabled
5    md1          2    single-lm-enabled
```

### Related Commands

None

# 13.3.55 ethernet cfm tst transmission enable

## Command Purpose

Use this command to enable test transmission enable.

## Command Syntax

ethernet cfm tst transmission enable session *SESSION_ID* domain *DOMAIN_NAME* ( vlan *VLAN_ID* | ) mep *MEPID* tx-mode ( fixed pkt-num *NUMBER* | continuous ) ( { pattern-type ( repeat *VALUE* | random | increment-byte | decrement-byte ) | packet-size *PACKET_SIZE* | dest-mac ( multicast | *MACADDRESS* ) } | )

no ethernet cfm tst transmission enable session *SESSION_ID* domain *DOMAIN_NAME* ( vlan *VLAN_ID* | ) mepid *MEPID*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SESSION_ID | session id | 1-4 |
| DOMAIN_NAME | Maintenance domain name | String with up to 43 characters |
| vlan VLAN_ID | Vlan id | 1-4094 |
| MEPID | Local mep id | 1-8191 |
| NUMBER | Transmission packet number | 1-65535 |
| VALUE | The value of repeat pattern type, the range is 0 to 0xFFFFFFFF | 0 - 0xFFFFFFFF |
| PACKET_SIZE | Transmission packet size, the range is 64 bytes to 16027 bytes, default is 512 bytes | 64-16027 bytes |
| multicast | The destination mac address of tst packets should be multicast address, default is multicast | - |
| MACADDRESS | The destination mac address of tst packets should be unicast mac address | - |

## Command Mode

Global Configuration

### Default

None

### Usage

None

### Examples

The following example shows how to enable maintenance domain tst for mep:

```
Switch# configure terminal
Switch(config)# ethernet cfm tst transmission enable domain md1 vlan 2 mepid 1 tx-mode continuous pattern-type random packet-size 1518
```

### Related Commands

None

## 13.3.56 ethernet cfm tst start/stop

### Command Purpose

Use this command to start or stop test transmission.

### Command Syntax

ethernet cfm tst start session *SESSION_ID* rate *RATE* time ( cos *COS_VALUE* | ) ( second *SECOND* | 1m | 15m | 2h | 24h ) ( *tx_port TX_PORT* | )

ethernet cfm tst stop

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SESSION_ID | session id | 1-4 |
| RATE | Transmission rate, the range is 1 to 10000, unit is mbps | 1-10000 mbps |
| cos COS_VALUE | Vlan priority, default value is 7 | 0-7 |
| SECOND | Transmission time from 1 second to 60 seconds | 1-60 seconds |

| | | |
|---|---|---|
| 15m | Transmission time for every rate is 15 minutes | - |
| 2h | Transmission time for every rate is 2 hours | - |
| 24h | Transmission time for every rate is 24 hours | - |
| TX_PORT | Transmission port, only valid for up mep | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following example shows how to start test transmission for mep:

```
Switch# configure terminal
Switch(config)# ethernet cfm tst start session 2 rate 10 time second 1

Switch# configure terminal
Switch(config)# ethernet cfm tst start time second 1
```

## Related Commands

None

# 13.3.57 ethernet cfm tst reception enable

## Command Purpose

Use this command to enable test packet reception.

## Command Syntax

ethernet cfm tst reception enable session *SESSION_ID* domain *DOMAIN_NAME* ( vlan *VLAN_ID* | ) mepid *MEPID*

no ethernet cfm tst reception enable session *SESSION_ID* domain *DOMAIN_NAME* ( vlan *VLAN_ID* | ) mepid *MEPID*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| session | Session id | 1-4 |
| DOMAIN_NAME | Maintenance domain name | String with up to 43 characters |
| vlan VLAN_ID | Vlan id | 1-4094 |
| MEPID | Local mep id | 1-8191 |

## Command Mode

Global Configuration

## Default

None

## Usage

Test transmission and reception must be configured on the same MEP.

## Examples

The following example shows how to enable test reception for mep:

```
Switch# configure terminal
Switch(config)# ethernet cfm tst reception enable session 1 domain md1 vlan 2 mep 1

Switch# configure terminal
Switch(config)# ethernet cfm tst reception enable domain md1 vlan 2 mepid 1
```

## Related Commands

None

## 13.3.58 show ethernet cfm tst

### Command Purpose

Use the command to display test information.

### Command Syntax

show ethernet cfm tst

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The sending side test information:

```
Switch# show ethernet cfm tst
DOMAIN           : md1
VLAN             : 2
MEPID            : 2
Transmission     : Disabled
Reception        : Enabled
Status           : Non-Running
Start Time       : null
End Time         : null
Packet Type      : null
Rate             : null
Packet Size      : null
Tx Number        : 0
Tx Bytes         : 0
Rx Number        : 28
Rx Bytes         : 1792
```

The receiving side test information:

```
Switch# show ethernet cfm tst
DOMAIN           : md1
VLAN             : 2
MEPID            : 2
Transmission     : Disabled
Reception        : Enabled
Status           : Non-Running
Start Time       : null
End Time         : null
Packet Type      : null
Rate             : null
Packet Size      : null
Tx Number        : 0
Tx Bytes         : 0
Rx Number        : 28
Rx Bytes         : 1792
```

### Related Commands

None

## 13.3.59 clear ethernet cfm tst counters

### Command Purpose

Use the command to clear test counters.

### Command Syntax

clear ethernet cfm tst counters

### Command Mode

Privileged EXEC

### Default

None

### Usage

When test transmission is running, can't clear ethernet cfm test counters.

### Examples

The following example shows how to clear test counters:

```
Switch# clear ethernet cfm tst counters
```

### Related Commands

None

## 13.4 CPU Traffic Limit Commands

### 13.4.1 cpu-traffic-limit total rate

#### Command Purpose

Use this command to set the total rate of all streams destined to CPU. Use the no form of this command to set the total rate to the default value.

#### Command Syntax

cpu-traffic-limit total rate *RATE_RANGE*

no cpu-traffic-limit total rate

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| RATE_RANGE | Rate of all streams destined to cpu in pps | 0-1000000 |

#### Command Mode

Global Configuration

#### Default

2048 pps

#### Usage

N/A

## Examples

This example shows how to configure cpu-traffic-limit total rate:

```
Switch# configure terminal
Switch(config)# cpu-traffic-limit total rate 3000
```

This example shows how to reset cpu-traffic-limit total rate:

```
Switch# configure terminal
Switch(config)# no cpu-traffic-limit total rate
```

## Related Commands

show cpu traffic-limit

# 13.4.2 cpu-traffic-limit reason rate

## Command Purpose

Use this command to set the individual limit rate for the stream carried with this reason. Use the no form of this command to set the individual limit rate of the reason to its default value.

## Command Syntax

cpu-traffic-limit reason { bpdu | slow-protocol | eapol | erps | smart-link | arp | dhcp | rip | ldp | ospf | pim | vrrp | ssh | telnet | mlag | tcp | ipda | icmp-redirect | mcast-rpf-fail | macsa-mismatch | port-security-discard | vlan-security-discard | ip-mtu-fail | ip-option | ucast-ttl-fail | mpls-ttl-fail | igmp | sflow-ingress | sflow-egress | fwd-to-cpu | udld | bfd-learning | bgp | dot1x-mac-bypass | egress-ttl-fail | icmpv6 | l2protocol-tunnel | loopback-detection | mirror-to-cpu | ndp | tunnel-gre-keepalive } rate *RATE_RANGE*

no cpu-traffic-limit reason { bpdu | slow-protocol | eapol | erps | smart-link | arp | dhcp | rip | ldp | ospf | pim | vrrp | ssh | telnet | mlag | tcp | ipda | icmp-redirect | mcast-rpf-fail | macsa-mismatch | port-security-discard | vlan-security-discard | ip-mtu-fail | ip-option | ucast-ttl-fail | mpls-ttl-fail | igmp | sflow-ingress | sflow-egress | fwd-to-cpu | udld | bfd-learning | bgp | dot1x-mac-bypass | egress-ttl-fail | icmpv6 | l2protocol-tunnel | loopback-detection | mirror-to-cpu | ndp | tunnel-gre-keepalive } rate

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| bpdu | Reason for BPDU protocols packets(including STP, RSTP, MSTP) | - |
| slow-protocol | Reason for slow protocol packets.(including EFM, LACP) | - |
| eapol | Reason for Dot1x protocol packets | - |
| erps | Reason for ERPS protocol packets<br>Reason for ERPS protocol packets | - |
| arp | Reason for ARP protocol packets | - |
| dhcp | Reason for DHCP protocol packets | - |
| rip | Reason for RIP protocol packets | - |
| bgp | Reason for BGP protocol packets | - |
| ldp | Reason for LDP protocol packets | - |
| ospf | Reason for OSPF protocol packets | - |
| pim | Reason for PIM protocol packets | - |
| vrrp | Reason for VRRP protocol packets | - |
| ssh | Reason for SSH protocol packets | - |
| telnet | Reason for Telnet protocol packets | - |
| mlag | Reason for MLAG protocol packets | - |
| tcp | Reason for TCP protocol packets | - |
| ipda | Reason for packets with IPDA destination to router itself | - |
| icmp-redirect | Reason for redirecting ICMP | - |
| mcast_rpf_fail | Reason for multi-cast packets with rpf fail | - |

| | | |
|---|---|---|
| macsa-mismatch | Reason for packets that are discarded for source mac is learned from another security port | - |
| port-security-discard | Reason for packets that are discarded for fdb number equals to allowed maximum number of security port | - |
| vlan-security-discard | Reason for packets that are discarded for fdb number equals to allowed maximum number on the specified vlan | - |
| ip-mtu-fail | Ip mtu fail | - |
| ip-option | Reason for IP packets with optional fields | - |
| ucast-ttl-fail | Reason for ucast ip packets with fail TTL | - |
| mpls-ttl-fail | Reason for mpls packets with fail TTL | - |
| igmp | Reason for IGMP or igmp snooping packets | - |
| sflow-ingress | Reason for sflow sampled packets at ingress direction | - |
| sflow-egress | Reason for sflow sampled packets at egress direction | - |
| fwd-to-cpu | Reason for packets forwarding to cpu | - |
| udld | Reason for packets unidirectional link detection protocol | - |
| bfd-learning | Reason for bfd learning packets | - |
| bgp | Reason for border gateway protocol packet | - |
| dot1x-mac-bypass | Reason for mac auth bypass packets | - |
| egress-ttl-fail | Reason for egress ttl fail packet | - |
| icmpv6 | Reason for ICMPv6 packet | - |
| l2protocol-tunnel | Reason for layer2 protocol tunnel packet | - |
| loopback-detection | Reason for loopback detection packet | - |

| | | |
|---|---|---|
| mirror-to-cpu | Reason for mirror-to-cpu packet | - |
| ndp | Reason for neighbor discovery protocol packet | - |
| tunnel-gre-keepalive | Reason for tunnel gre keepalive reply packet | - |
| RATE_RANGE | Individual rate of streams destined to cpu carried with the reason in kbps | 0-1000000 |

## Command Mode

Global Configuration

## Default

| Reason | Rate(pps) | Reason | Rate(pps) |
|---|---|---|---|
| bpdu | 64 | icmp-redirect | 128 |
| slow-protocol | 128 | mcast-rpf-fail | 128 |
| eapol | 128 | macsa-mismatch | 128 |
| erps | 128 | port-security-discard | 128 |
| smart-link | 128 | vlan-security-discard | 128 |
| arp | 640 | udld | 128 |
| dhcp | 128 | ip-mtu-fail | 64 |
| rip | 64 | fwd-to-cpu | 64 |
| ldp | 512 | ip-option | 512 |
| ospf | 256 | ucast-ttl-fail | 64 |
| pim | 128 | mpls-ttl-fail | 64 |
| vrrp | 512 | igmp | 128 |
| ssh | 64 | telnet | 64 |
| mlag | 1024 | tcp | 64 |
| ipda | 1024 | sflow-ingress | 128 |
| sflow-egress | 128 | bfd-learning | 128 |

## Usage

ssh/telnet/mlag is useful when enable cpu-traffic-optimize.

## Examples

This example shows how to configure individual rate for BPDU PDU:

```
Switch# configure terminal
Switch(config)# cpu-traffic-limit reason bpdu rate 300
```

This example shows how to reset individual rate for BPDU PDU:

```
Switch# configure terminal
Switch(config)# no cpu-traffic-limit reason bpdu rate
```

## Related Commands

show cpu traffic-limit

# 13.4.3 cpu-traffic-limit reason class

## Command Purpose

Use this command to set the priority class for the stream carried with the reason. Use the no form of this command to set the priority class of the reason to its default value.

## Command Syntax

cpu-traffic-limit reason { bpdu | slow-protocol | eapol | erps | smart-link | arp | dhcp | rip | ldp | ospf | pim | vrrp | ssh | telnet | mlag | tcp | ipda | icmp-redirect | mcast-rpf-fail | macsa-mismatch | port-security-discard | vlan-security-discard | ip-mtu-fail | ip-option | ucast-ttl-fail | mpls-ttl-fail | igmp | sflow-ingress | sflow-egress | fwd-to-cpu | udld | bfd-learning | bgp | dot1x-mac-bypass | egress-ttl-fail | icmpv6 | l2protocol-tunnel | loopback-detection | mirror-to-cpu | ndp | tunnel-gre-keepalive } class *CLASS_RANGE*

no cpu-traffic-limit reason { bpdu | slow-protocol | eapol | erps | smart-link | arp | dhcp | rip | ldp | ospf | pim | vrrp | ssh | telnet | mlag | tcp | ipda | icmp-redirect | mcast-rpf-fail | macsa-mismatch | port-security-discard | vlan-security-discard | ip-mtu-fail | ip-option | ucast-ttl-fail | mpls-ttl-fail | igmp | sflow-ingress | sflow-egress | fwd-to-cpu | udld | bfd-learning | bgp | dot1x-mac-bypass | egress-ttl-fail | icmpv6 | l2protocol-tunnel | loopback-detection | mirror-to-cpu | ndp | tunnel-gre-keepalive } class

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| CLASS_RANGE | Priority of the stream carried with this reason. Reason with class 3 has the highest priority. | 0-3 |

## Command Mode

Global Configuration

## Default

| Reason | class | Reason | class |
|---|---|---|---|
| bpdu | 3 | icmp-redirect | 0 |
| slow-protocol | 1 | mcast-rpf-fail | 1 |
| eapol | 0 | macsa-mismatch | 0 |
| erps | 2 | port-security-discard | 0 |
| smart-link | 2 | vlan-security-discard | 0 |
| arp | 1 | udld | 3 |
| dhcp | 0 | mtu-dontfrag | 0 |
| rip | 1 | mtu-frag | 0 |
| ldp | 1 | sflow-ingress | 0 |
| ospf | 1 | ip-option | 0 |
| pim | 1 | ucast-ttl-fail | 0 |
| vrrp | 1 | mpls-ttl-fail | 0 |
| igmp | 2 | ssh | 3 |
| telnet | 3 | mlag | 1 |
| tcp | 2 | ipda | 0 |
| igmp | 2 | mld | 2 |
| sflow-egress | 0 | dot1x-mac-bypass | 2 |
| fwd-to-cpu | 0 | bfd-learning | 1 |

## Usage

The reason with the highest priority class will get preference treatment when dealing with scheduling. ssh/telnet/mlag is useful when enable cpu-traffic-optimize.

### Examples

This example shows how to configure priority class for BPDU:

```
Switch# configure terminal
Switch(config)# cpu-traffic-limit reason bpdu class 3
```

This example shows how to restore the default priority class for BPDU:

```
Switch# configure terminal
Switch(config)# no cpu-traffic-limit reason bpdu class
```

### Related Commands

show cpu traffic-limit

## 13.4.4 show cpu traffic-limit

### Command Purpose

Use this command to show the CPU traffic-limit configurations.

### Command Syntax

show cpu traffic-limit

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows cpu traffic-limit configurations:

```
DUT2# show cpu traffic-limit
reason                      rate (pps)    class
dot1x-mac-bypass            64             2
bpdu                        64             3
slow-protocol               256            1
eapol                       128            0
erps                        128            3
smart-link                  128            2
udld                        128            3
loopback-detection          64             3
arp                         256            1
dhcp                        128            0
rip                         64             1
ldp                         512            1
ospf                        256            1
pim                         128            1
bgp                         256            1
vrrp                        512            1
ndp                         64             2
icmpv6                      64             2
ssh                         64             3
telnet                      64             3
mlag                        1000           1
tcp                         64             2
ipda                        1000           0
icmp-redirect               128            0
mcast-rpf-fail              128            1
macsa-mismatch              128            0
port-security-discard       128            0
vlan-security-discard       128            0
egress-ttl-fail             64             0
ip-mtu-fail                 64             0
bfd-learning                128            1
ptp                         512            2
ip-option                   512            0
tunnel-gre-keepalive        64             0
ucast-ttl-fail              64             0
mpls-ttl-fail               64             0
igmp                        128            2
sflow-ingress               128            0
sflow-egress                128            0
fwd-to-cpu                  64             0
l2protocol-tunnel           1000           0
mirror-to-cpu               1000           0
Total rate:      2048 (pps)
```

## Related Commands

cpu-traffic-limit total rate

cpu-traffic-limit reason rate

# 13.5 CPU Traffic Statistics Commands

## 13.5.1 cpu-traffic-statistics time

### Command Purpose

Use this command to set the CPU receive packets or CPU transmit packets statistics time.

### Command Syntax

cpu-traffic-statistics time *RATE-TIME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| RATE-TIME | Rate of statistics time | 1-10 seconds |

### Command Mode

Global Configuration

### Default

5 s

### Usage

N/A

### Examples

This example shows how to configure cpu-traffic-statistics time:

```
Switch# configure terminal
Switch(config)# cpu-traffic-statistics time 2
```

### Related Commands

N/A

## 13.5.2 no cpu-traffic-statistics time

### Command Purpose

Use this command to reset the CPU receive packets or CPU transmit packets statistics time.

### Command Syntax

no cpu-traffic-statistics time

### Command Mode

Global Configuration

### Default

N/A

### Usage

N/A

### Examples

This example shows how to reset cpu-traffic-statistics time:

```
Switch# configure terminal
Switch(config)# no cpu-traffic-statistics time
```

### Related Commands

N/A

## 13.5.3 show cpu traffic- statistics receive

### Command Purpose

Use this command to show CPU receive packets by reason.

## Command Syntax

show cpu traffic-statistics receive ( bpdu | slow-protocol | eapol | erps | smart-link | arp | dhcp | rip | ldp | ospf | pim | bgp | vrrp | ssh | telnet | mlag | tcp | ipda | icmp-redirect | mcast-rpf-fail | macsa-mismatch | port-security-discard | vlan-security-discard | ip-mtu-fail | ip-option | ucast-ttl-fail | sflow-ingress | sflow-egress | igmp | udld | dot1x-mac-bypass | l2protocol-tunnel | mirror-to-cpu | tunnel-gre-keepalive | loopback-detection | rsvp | bfd-learning | mpls-ttl-fail | fwd-to-cpu | ptp | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| bpdu | Reason for BPDU protocols packets(including STP, RSTP, MSTP) | - |
| slow-protocol | Reason for slow protocol packets.(including EFM, LACP) | - |
| eapol | Reason for Dot1x protocol packets | - |
| erps | Reason for ERPS protocol packets | - |
| arp | Reason for ARP protocol packets | - |
| dhcp | Reason for DHCP protocol packets | - |
| rip | Reason for RIP protocol packets | - |
| bgp | Reason for BGP protocol packets | - |
| ldp | Reason for LDP protocol packets | - |
| ospf | Reason for OSPF protocol packets | - |
| pim | Reason for PIM protocol packets | - |
| vrrp | Reason for VRRP protocol packets | - |
| ssh | Reason for SSH protocol packets | - |
| telnet | Reason for Telnet protocol packets | - |
| mlag | Reason for MLAG protocol packets | - |

| | | |
|---|---|---|
| tcp | Reason for TCP protocol packets | - |
| ipda | Reason for packets with IPDA destination to router itself | - |
| icmp-redirect | Reason for redirecting ICMP | - |
| learning-full | Reason for learning cache is full | - |
| mcast_rpf_fail | Reason for multi-cast packets with rpf fail | - |
| macsa-mismatch | Reason for packets that are discarded for source mac is learned from another security port | - |
| port-security-discard | Reason for packets that are discarded for fdb number equals to allowed maximum number of security port | - |
| vlan-security-discard | Reason for packets that are discarded for fdb number equals to allowed maximum number on the specified vlan | - |
| ip-mtu-fail | Ip mtu fail | - |
| Ip-option | Reason for IP packets with optional fields | - |
| ucast-ttl-fail | Reason for ucast ip packets with fail TTL | - |
| mpls-ttl-fail | Reason for mpls packets with fail TTL | - |
| Igmp | Reason for IGMP or igmp snooping packets | - |
| sflow-ingress | Reason for sflow sampled packets at ingress direction | - |
| sflow-egress | Reason for sflow sampled packets at egress direction | - |
| fwd-to-cpu | Reason for packets forwarding to cpu | - |
| bfd-learning | Reason for bfd learning packets | - |
| mld | mld packets or mld snooping packets | - |
| dot1x-mac-bypass | mac auth bypass packets | - |

### Command Mode

Privileged EXEC

### Default

N/A

### Usage

N/A

### Examples

This example shows how to show cpu receive BPDU packets:

```
Switch# show cpu traffic-statistics receive bpdu
statistics rate time is 5 second(s)
reason           count(packets)     rate(pps)
bpdu                    0                0
```

### Related Commands

show cpu traffic-statistics receive all

## 13.5.4 show cpu traffic-statistics receive all

### Command Purpose

Use this command to show CPU receive all packets.

### Command Syntax

show cpu traffic-statistics receive all

### Command Mode

Privileged EXEC

## Default

N/A

## Usage

N/A

## Examples

This example shows how to show CPU receive all packets:

```
Switch# show cpu traffic-statistics receive all
statistics rate time is 5 second(s)
reason           count(packets)    rate(pps)
dot1x-mac-bypass       0               0
bpdu                   0               0
slow-protocol          0               0
eapol                  0               0
erps                   0               0
smart-link             0               0
udld                   0               0
loopback-detection     0               0
arp                    0               0
dhcp                   0               0
rip                    0               0
ldp                    0               0
ospf                   0               0
pim                    0               0
bgp                    0               0
vrrp                   0               0
rsvp                   0               0
ssh                    0               0
telnet                 0               0
mlag                   0               0
tcp                    0               0
ipda                   0               0
icmp-redirect          0               0
mcast-rpf-fail         0               0
macsa-mismatch         0               0
port-security-discard  0               0
vlan-security-discard  0               0
ip-mtu-fail            0               0
bfd-learning           0               0
ptp                    0               0
ip-option              0               0
tunnel-gre-keepalive   0               0
ucast-ttl-fail         0               0
mpls-ttl-fail          0               0
igmp                   0               0
sflow-ingress          0               0
```

```
sflow-egress            0               0
fwd-to-cpu              0               0
l2protocol-tunnel       0               0
mirror-to-cpu           0               0
mpls-tp-pwoam           0               0
other                   0               0
Total                   0               0
```

### Related Commands

N/A

## 13.5.5 show cpu traffic-statistics transmit

### Command Purpose

Use this command to show the CPU transmit all packets.

### Command Syntax

show cpu-traffic -statistic transmit

### Command Mode

Privileged EXEC

### Default

N/A

### Usage

CPU transmit packets statistics not distinguish reason.

### Examples

This example shows how to show the CPU transmit all packets:

```
Switch# show cpu traffic-statistics transmit
statistics rate time is 5 second(s)
                 count(packets)     rate(pps)
Total                   0               0
```

### Related Commands

N/A

## 13.6 CPU Traffic Protect Commands

### 13.6.1 cpu-traffic-protect

### Command Purpose

Use this command to enable and enter into cpu traffic protect mode.Use the no form of this command to disable cpu traffic protect mode.

### Command Syntax

cpu-traffic-protect ( arp | dhcp )

no cpu-traffic-protect ( arp | dhcp )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| arp | ARP packet | - |
| dhcp | DHCP packet, cpu traffic protect dhcp at port level is enabled. | - |

### Command Mode

Global Configuration

### Default

None

### Usage

When cpu-traffic-protect arp is configured, blacklist mode is entered default. When cpu-traffic-protect dhcp is configured, cpu traffic protect dhcp at port level is enabled.

### Examples

This example shows how to enable and enter into cpu traffic protect mode:

```
Switch# configure terminal
Switch(config)# cpu-traffic-protect arp
Switch(config-cpu-traffic-protect)#
```

### Related Commands

N/A

## 13.6.2 trace enable

### Command Purpose

Use this command to enable attack trace.Use the no form of this command to disable attack trace.

### Command Syntax

trace enable

no trace enable

### Command Mode

Cpu traiffic Protect Configuration

### Default

None

### Usage

None

### Examples

This example shows how to enable attack trace:

```
Switch# configure terminal
Switch(config-cpu-traffic-protect)# trace enable
```

### Related Commands

N/A

## 13.6.3 trace type

### Command Purpose

Use this command to configure attack trace type.Use the no form of this command to set to the default type.

### Command Syntax

trace type ( sender-ip | src-mac | target-ip | source-portvlan | src-interface )

no trace type

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| sender-ip | ARP packet sender ip address | - |
| src-mac | ARP packet source MAC | - |
| target-ip | ARP packet target ip address | - |
| source-portvlan | The port and vlan packet input | - |
| source-interface | The source interface DHCP packet input，only can be used when cpu-traffic-protect dhcp. | - |

### Command Mode

Cpu traiffic Protect Configuration

### Default

Trace type default for ARP: src-mac;

Trace type default for DHCP: src-interface

## Usage

Trace type of dhcp only supports src-interface, and arp trace type includes all except src-interface.

## Examples

This example shows how to configure attack trace type to sender-ip and targe-ip:

```
Switch# configure terminal
Switch(config)# cpu-traffic-protect arp
Switch(config-cpu-traffic-protect)# trace type sender-ip target-ip
```

## Related Commands

N/A

# 13.6.4 trace sample

## Command Purpose

Use this command to configure attack trace sample rate.Use the no form of this command to set sample to the default.

## Command Syntax

trace sample *SAMPLE-RATE*

no trace sample

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SAMPLE-RATE | Attack trace sample rate | 1-1024 |

## Command Mode

Cpu traiffic Protect Configuration

## Default

Trace sample default for ARP: 8;

Trace sample default for DHCP: 1

## Usage

None

## Examples

This example shows how to configure attack trace sample rate to 16:

```
Switch# configure terminal
Switch(config)# cpu-traffic-protect arp
Switch(config-cpu-traffic-protect)# trace sample 16
```

## Related Commands

None

# 13.6.5 trace threshold

## Command Purpose

Use this command to configure attack trace cheking threshold.Use the no form of this command to set threshole to the default.

## Command Syntax

trace threshold *THRESHOLD*

no trace threshold

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| THRESHOLD | Attack trace checking threshold | 1-65535,unit:pps |

## Command Mode

Cpu traiffic Protect Configuration

## Default

Trace threshold default for ARP: 128;

Trace threshold default for DHCP: 64

## Usage

None

## Examples

This example shows how to configure attack trace cheking threshold to 10:

```
Switch# configure terminal
Switch(config)# cpu-traffic-protect arp
Switch(config-cpu-traffic-protect)# trace threshold 10
```

## Related Commands

None

# 13.6.6 trace timeout

## Command Purpose

Use this command to configure trace aging timeout.Use the no form of this command to set aging timeout to the default.

## Command Syntax

trace timeout *AGING-TIMEOUT*

no trace timeout

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| AGING-TIMEOUT | Attack trace aging timeout | 30-1000000,unit:s |

## Command Mode

Cpu traiffic Protect Configuration

## Default

Trace timeout default for ARP: 300s

## Usage

None

## Examples

This example shows how to configure attack trace timeout to 400:

```
Switch# configure terminal
Switch(config)# cpu-traffic-protect arp
Switch(config-cpu-traffic-protect)# trace timeout 400
```

## Related Commands

None

# 13.6.7 trace action

## Command Purpose

Use this command to configure attack trace punish action.Use the no form of this command to set trace action to the default.

## Command Syntax

trace action deny ( recover time *RECOVER-TIME* | )

no trace action

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| RECOVER-TIME | Attack trace punish action auto-recover time | 1-86400,unit:s |

## Command Mode

Cpu traiffic Protect Configuration

## Default

recover time 300

## Usage

Only used for cpu-traffic-protect dhcp, default is to deny dhcp packets and recover in 300s

## Examples

This example shows how to configure attack trace action recover time to 600:

```
Switch# configure terminal
Switch(config)# cpu-traffic-protect dhcp
Switch(config-cpu-traffic-protect)# trace action deny recover time 600
```

## Related Commands

cpu-traffic-protect manual recover dhcp

# 13.6.8 trace protect delay-time

## Command Purpose

Use this command to configure trace protect delay-time.Use the no form of this command to set protect delay-time to the default.

## Command Syntax

trace protect delay-time *DELAY-TIME*

no trace delay-time

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DELAY-TIME | delay-time for protect action is enabled | 0-86400,unit:s |

## Command Mode

Cpu traiffic Protect Configuration

## Default

10

## Usage

Only used for cpu-traffic-protect dhcp, represents continuously being attacked for how long time to enable cpu traffic protect dhcp.

## Examples

This example shows how to configure attack protect delay-time to 15:

```
Switch# configure terminal
Switch(config)# cpu-traffic-protect arp
Switch(config-cpu-traffic-protect)# trace protect delay-time 15
```

## Related Commands

None

# 13.6.9 apply access-list

## Command Purpose

Use this command to configure arp protect filter rules.Use the no form of this command to disable rules.

## Command Syntax

apply access-list *NAME* ( mode ( blacklist | whitelist ( rate *RATE* | ) ) | )

no apply access-list *ACL-NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ACL-NAME | Extend ip access list name | - |
| blacklist | Blacklist mode | - |
| whitelist | Whitelist mode | - |
| RATE | Packet to cpu rate | 32-2048,unit:pps |

## Command Mode

Cpu traiffic Protect Configuration

### Default

Rate: 32pps

Mode: blacklist

### Usage

The rate is calculated by using 64 Btyes packet

### Examples

This example shows how to configure arp protect filter rules with access list 2 and enter into whitelist mode and the rate is 64pps:

```
Switch# configure terminal
Switch(config)# cpu-traffic-protect arp
Switch(config-cpu-traffic-protect)# apply access-list 2 mode whitelist rate 64
```

### Related Commands

None

## 13.6.10 cpu-traffic-protect manual recover dhcp

### Command Purpose

Use this command to manually recover dhcp protocol of interfaces being punished by cpu traffic protect.

### Command Syntax

cpu-traffic-protect manual recover dhcp ( interface ( *IFPHYSICAL* | *IFAGG* | *IFVLAN* ) | all )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFPHYSICAL | Ethernet interface name | - |
| IFAGG | Link aggregation interface name | - |
| IFVLAN | VLAN interface name | - |
| all | All interfaces being punished | - |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to configure cpu-traffic-protect manual recover dhcp for interface eth-0-1:

```
Switch# cpu-traffic-protect manual recover dhcp interface eth-0-1
```

### Related Commands

trace action

## 13.6.11 show cpu traffic-protect dhcp recover table

### Command Purpose

Use this command to show the information table of interfaces being protected by cpu traffic and their recover time of dhcp protocol.

### Command Syntax

show cpu traffic-protect dhcp recover table

### Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to show cpu traffic-protect dhcp recover table:

```
Switch# show cpu traffic-protect dhcp recover table
Dhcp Recover State Table :
------------------------------------------------------------------------
Interface  RecoverTime(s)
------------------------------------------------------------------------
eth-0-1    30
------------------------------------------------------------------------
Total: 1
```

## Related Commands

trace protect delay-time

# 13.6.12 show cpu traffic-protect trace

## Command Purpose

Use this command to show the information of attack trace.

## Command Syntax

show cpu traffic-protect ( arp | dhcp ) trace ( history | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| arp | ARP packet | - |
| dhcp | DHCP packet | - |
| histroy | History trace information | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to show the information of arp attack trace:

```
Switch# show cpu traffic-protect arp trace
Attack Source User Table :
------------------------------------------------------------------------
MacAddress       Interface  Vlan:O/I  AttackTime           TotalPackets
------------------------------------------------------------------------
0000.0b00.0200   eth-0-3    -         2019-01-02 15:18:21  1712
------------------------------------------------------------------------
Total: 1

Attack Source Port Table :
------------------------------------------------------------------------
Interface  Vlan:O/I  AttackTime           TotalPackets
------------------------------------------------------------------------
------------------------------------------------------------------------
Total: 0

Attack Sender IP Table :
------------------------------------------------------------------------
IPAddress        AttackTime           TotalPackets
------------------------------------------------------------------------
1.2.3.4          2019-01-02 15:21:24  184
------------------------------------------------------------------------
Total: 1

Attack Target IP Table :
------------------------------------------------------------------------
IPAddress        AttackTime           TotalPackets
------------------------------------------------------------------------
4.3.2.1          2019-01-02 15:21:24  184
------------------------------------------------------------------------
Total: 1
```

## Related Commands

clear cpu traffic-protect trace

# 13.6.13 show cpu traffic-protect trace config

## Command Purpose

Use this command to show the configure information of attack trace config.

## Command Syntax

show cpu traffic-protect ( arp | dhcp ) trace config

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| arp | ARP packet | - |
| dhcp | DHCP packet | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to show the information of arp attack trace config:

```
Switch# show cpu traffic-protect arp trace config
Trace arp configuration:
Reason           :16
Enable           :1
Mode             :0x1
Sample           :18
Threshold        :35
Aging timeout    :300
```

## Related Commands

None

## 13.6.14 show resource cpu traffic-protect

### Command Purpose

Use this command to show the information of resource used.

### Command Syntax

show resource cpu traffic-protect

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to show the information of resource used:

```
Switch# show resource cpu traffic-protect

Cpu traffic-protect
Resource                          Used          Capability
============================================================
ACEs                              3             200
```

### Related Commands

show resource qos

## 13.6.15 clear cpu traffic-protect trace

### Command Purpose

Use this command to clear the history information of attack trace.

### Command Syntax

clear cpu traffic-protect ( arp | dhcp ) trace ( history | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| arp | ARP packet | - |
| dhcp | DHCP packet | - |
| histroy | History trace information | - |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to clear the information of arp attack history trace:

```
Switch# clear cpu traffic-protect arp trace history
```

### Related Commands

None

# 13.7 UDLD Commands

## 13.7.1 udld enable

### Command Purpose

Use this command enable/disable global UDLD state.

### Command Syntax

udld enable

no udld enable

### Command Mode

Global Configuration

### Default

Disabled

### Usage

None

### Examples

This example shows how to enable global UDLD state:

```
Switch# configure terminal
Switch(config)# udld enable
```

### Related Commands

show udld

## 13.7.2 udld port

### Command Purpose

Use this command to enable/disable UDLD state on a specific interface.

### Command Syntax

udld port ( aggressive | )

no udld port

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| aggressive | UDLD aggressive mode | - |

### Command Mode

Interface Configuration

### Default

Disabled

### Usage

None

### Examples

This example shows how to enable UDLD on interface eth-0-9:

```
Switch# configure terminal
Switch(config)# interface eth-0-9
Switch(config)# udld port
```

### Related Commands

show udld

## 13.7.3 udld message interval

### Command Purpose

Use this command to set the UDLD message interval. Use no command to set the interval to default value.

### Command Syntax

udld message interval *INTERVAL*

no udld message interval

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INTERVAL | UDLD message interval (seconds). The range is 1-90 | 1-90 seconds |

### Command Mode

Global Configuration

### Default

15s

### Usage

None

### Examples

This example shows how to set UDLD message interval to 5 seconds:

```
Switch# configure terminal
Switch(config)# udld message interval 5
```

### Related Commands

show udld

## 13.7.4 udld reset

### Command Purpose

Use this command to reset the interfaces disabled by UDLD.

### Command Syntax

udld reset

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to reset interfaces disabled by UDLD:

```
Switch# udld reset
```

### Related Commands

None

## 13.7.5 show udld

### Command Purpose

Use this command to show UDLD information of interfaces.

## Command Syntax

show udld ( *IFNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | Interface name | Support physical ports |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to show UDLD information of interface eth-0-1:

```
Switch# show udld eth-0-1
Interface eth-0-1
---
UDLD mode      : aggressive mode
Operational state  : Bidirectional
Message interval  : 15
Time out interval   : 3
Neighbor 1
---
Device ID          : 001e.0808.0360
Port ID            : eth-0-2
Device Name        : DUT2
Message Interval   : 15
Timeout Interval   : 3
Link status        : Bidirectional
Expiration time    : 40
```

## Related Commands

None

## 13.7.6 show udld neighbors

### Command Purpose

Use this command to show information of UDLD neighbors.

### Command Syntax

show udld neighbors

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to show UDLD neighbor information:

```
Switch# show udld neighbor
Port        Device Name        Device ID       Port ID     Neighbor State
----        -----------        ---------       -------     --------------
eth-0-9    DUT2                d4f2.489f.d100 eth-0-9    bidirectional
```

### Related Commands

None

## 13.7.7 debug udld

### Command Purpose

Use this command to debug UDLD.

## Command Syntax

debug udld ( all | packet | events )

no debug udld ( all | packet | events )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| all | Show both packet and events | - |
| packet | Show packets only | - |
| events | Show events only | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to enable UDLD debug for packets:

```
Switch# debug udld packet
```

## Related Commands

None

# 13.7.8 show debugging udld

## Command Purpose

Use this command to show UDLD debugging status.

### Command Syntax

show debugging udld

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to show UDLD debugging status:

```
Switch# show debugging udld
```

### Related Commands

None

## 13.8 ERPS Commands

### 13.8.1 erps

### Command Purpose

Use this command to create erps domain instance.

Use the no form of this command to remove the erps domain instance

### Command Syntax

erps *DOMAINID* ( *ERPS_NAME* | )

no erps *DOMAINID*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DOMAINID | ERPS domain ID. | 1-255 |
| ERPS_NAME | ERPS domain name | String with up to 15 characters |

## Command Mode

Global Configuration

## Default

None

## Usage

This command is used to create or delete an erps domain. The command should the use first when config erps.

ERPS_NAME is optional. If no name is provided by command, system will generate the domain name automatically. The name format follows “ERPS001”, where 001 can be instead of any domain ID between 1-255 provided through the command.

## Examples

This example shows how to create an erps domain with ID 11 and name test11:

```
Switch# configure terminal
Switch(config)# erps 11 test11
```

## Related Commands

show erps list

# 13.8.2 erps control vlan

## Command Purpose

Use this command to specify erps domain’s control vlan.

Use the no form of this command to remove the control vlan.

## Command Syntax

erps *DOMAINID* ( primary | sub ) control vlan *VLANID*

no erps *DOMAINID* ( primary | sub ) control vlan

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DOMAINID | ERPS domain ID. | 1-255 |
| primary | primary ring | - |
| sub | sub ring | - |
| VLANID | vlan id | 2-4094 |

## Command Mode

Global Configuration

## Default

None

## Usage

The erps protocol packet is transferred in the control vlan.

It is best to add the control vlan into the instance which is bound by the domain.

## Examples

This example shows how to set vlan 15 as primary control vlan for erps domain 11:

```
Switch# configure terminal
Switch(config)# vlan database
Switch(config-vlan)# vlan 15
Switch(config-vlan)# exit
Switch(config)# erps 11 primary control vlan 15
```

## Related Commands

show erps

## 13.8.3 erps hellotime

### Command Purpose

Use this command to set hello timer interval for specific erps domain instance.

Use the no form of this command to restore the default value.

### Command Syntax

erps *DOMAINID* hellotime *HELLOTIME*

no erps *DOMAINID* hellotime

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DOMAINID | ERPS domain ID. | 1-255 |
| HELLOTIME | Hello timer interval | 1-150 in the multiple of 100 ms |

### Command Mode

Global Configuration

### Default

The default hellotime is 10（1 second）, unit is 100ms

### Usage

The timer should be the same of all nodes in the ring.

### Examples

This example shows how to set hello timer interval of erps domain 11 to 20s:

```
Switch# configure terminal
Switch(config)# erps 11 hellotime 20
```

### Related Commands

show erps

## 13.8.4 erps failtime

### Command Purpose

Use this command to set the fail timer interval for specific erps domain instance.

Use the no form of this command to restore the default value.

### Command Syntax

erps *DOMAINID* failtime *FAILTIME*

no erps *DOMAINID* failtime

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DOMAINID | ERPS domain ID. | 1-255 |
| FAILTIME | Fail timer interval | 3-450 in the multiple of 100 ms |

### Command Mode

Global Configuration

### Default

The default failtime is 30(3 seconde), unit is 100ms

### Usage

The timer should be the same of all nodes in the ring.

### Examples

This example shows how to set fail timer interval of erps domain 11 to 60s:

```
Switch# configure terminal
Switch(config)# erps 11 failtime 60
```

### Related Commands

show erps

## 13.8.5 erps mstp instance

### Command Purpose

Use this command to set the mstp instance protected by ERPS.

Use the no form of this command to remove the protected mstp instance.

### Command Syntax

erps *DOMAINID* mstp instance *INSTANCE_ID*

no erps *DOMAINID* mstp instanc

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DOMAINID | ERPS domain ID | 1-255 |
| INSTANCE_ID | MSTP instance. | 1-4094 |

### Command Mode

Global Configuration

### Default

None

### Usage

No default instance is specified.

### Examples

This example shows how to set instance 1 as ERPS11's protected instance:

```
Switch#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# erps 11 mstp instance 1
```

### Related Commands

show erps

## 13.8.6 erps ring level

### Command Purpose

Use this command to create an ERPS ring for specific ERPS domain.

Use the no form of this command to remove the ERPS ring.

### Command Syntax

erps *DOMAINID* ring *RINGID* level ( primary | sub )

no erps *DOMAINID* ring *RINGID*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DOMAINID | ERPS domain ID | 1-255 |
| RINGID | ERPS ring ID | 1-255 |
| primary | Primary ring | - |
| sub | Sub ring | - |

### Command Mode

Global Configuration

### Default

None

### Usage

The rings in the erps domain are divided into primary and subrings that are differentiated by the configuration.

### Examples

This example shows how to create a sub ring with ID 1 for ERPS domain 11:

```
Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#erps 11 ring 1 level sub
```

### Related Commands

show erps

## 13.8.7 erps ring mode

### Command Purpose

Use this command to set specific ERPS ring instance node mode.

Use the no form of this command to restore the default mode.

### Command Syntax

erps *DOMAINID* ring *RINGID* mode ( master | transit )

no erps *DOMAINID* ring *RINGID* mode

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DOMAINID | ERPS domain ID | 1-255 |
| RINGID | ERPS ring ID | 1-255 |
| master | Master node | - |
| transit | Transit node | - |

### Command Mode

Global Configuration

### Default

The mode is not set by default.

### Usage

The master node is used to send and receive erps protocol packet.

The transit node is used to transfer erps protocol packet to neighbor switch.

### Examples

This example shows how to set node as ERPS domain 11 ring 1 transit node:

```
Switch# configure terminal
Switch(config)# erps 11 ring 1 mode transit
```

### Related Commands

show erps

## 13.8.8 erps ring primary interface

### Command Purpose

Use this command to set primary interface for specific ERPS ring instance.

Use the no form of this command to unset the primary interface.

### Command Syntax

erps *DOMAINID* ring *RINGID* primary interface ( *IFPHYSICAL* | *IFAGG* )

no erps *DOMAINID* ring *RINGID* primary interface

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DOMAINID | ERPS domain ID | 1-255 |
| RINGID | ERPS ring ID | 1-255 |
| IFPHYSICAL | Ethernet interface name | - |
| IFAGG | Link aggregation interface name | - |

### Command Mode

Global Configuration

### Default

None

### Usage

For master node, the interface with type primary is used to send erps protocol packet.

Only the interface in trunk/dot1q-tunnel mode can be set as primary interface.

## Examples

This example shows how to set interface eth-0-9 as primary interface for ERPS domain 11 ring 1:

```
Switch# configure terminal
Switch(config)#interface eth-0-9
Switch(config-if)#switchport mode trunk
Switch(config-if)#switchport trunk allowed vlan add 15
Switch(config-if)#exit
Switch(config)#erps 11 ring 1 primary interface eth-0-9
```

## Related Commands

show erps

# 13.8.9 erps ring secondary interface

## Command Purpose

Use this command to set secondary interface for specific ERPS ring instance.

Use the no form of this command to unset the secondary interface.

## Command Syntax

erps *DOMAINID* ring *RINGID* secondary interface ( *IFPHYSICAL* | *IFAGG* )

no erps *DOMAINID* ring *RINGID* secondary interface

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DOMAINID | ERPS domain ID | 1-255 |
| RINGID | ERPS ring ID | 1-255 |
| IFPHYSICAL | Ethernet interface name | - |
| IFAGG | Link aggregation interface name | - |

## Command Mode

Global Configuration

## Default

None

## Usage

Only the interface in trunk/dot1q-tunnel mode can be set as secondary interface.

## Examples

This example shows how to set interface eth-0-9 as primary interface for ERPS domain 11 ring 1:

```
Switch# configure terminal
Switch(config)#interface eth-0-9
Switch(config-if)#switchport mode trunk
Switch(config-if)#switchport trunk allowed vlan add 15
Switch(config-if)#exit
Switch(config)#erps 11 ring 1 secondary interface eth-0-9
```

## Related Commands

show erps

# 13.8.10 erps ring interface

## Command Purpose

Use this command to set interface for specific ERPS ring instance.

Use no form of this command to unset interface for specific ERPS ring instance.

## Command Syntax

erps *DOMAINID* ring *DOMAINID* interface ( *IFPHYSICAL* | *IFAGG* )

no erps *DOMAINID* ring *DOMAINID* interface

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DOMAINID | ERPS domain ID | 1-255 |
| RINGID | ERPS ring ID | 1-255 |
| IFPHYSICAL | Ethernet interface name | - |

| | | |
|---|---|---|
| IFAGG | Link aggregation interface name | - |

## Command Mode

Global Configuration

## Default

None

## Usage

None

## Examples

This example shows how to set interface eth-0-9 as interface for ERPS domain 11 ring 1:

```
Switch# configure terminal
Switch(config)#interface eth-0-9
Switch(config-if)#switchport mode trunk
Switch(config-if)#switchport trunk allowed vlan add 15
Switch(config-if)#exit
Switch(config)#erps 11 ring 1 interface eth-0-9
```

## Related Commands

show erps

# 13.8.11 erps ring edge-mode

## Command Purpose

Use this command to set specific ERPS ring instance edge node mode.

Use the no form of this command to unset specific ERPS ring instance edge node mode.

## Command Syntax

erps *DOMAINID* ring *DOMAINID* edge-mode ( edge | assistant-edge )

no erps *DOMAINID* ring *DOMAINID* mode

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DOMAINID | ERPS domain ID | 1-255 |
| RINGID | ERPS ring ID | 1-255 |
| edge | Edge node | - |
| assistant-edge | Assistant-edge node | - |

## Command Mode

Global Configuration

## Default

None

## Usage

Both the edge node and the assistant-edge node are special transit nodes.

Once a node is set to edge/assistant-edge node, it will be set to transit node automatically.

## Examples

This example shows how to set node as ERPS domain 11 ring 1 edge node:

```
Switch# configure terminal
Switch(config)# erps 11 ring 1 edge-mode edge
```

## Related Commands

show erps

# 13.8.12 erps ring edge interface

## Command Purpose

Use this command to set edge interface for specific ERPS ring instance.

Use the no form of this command to unset the edge interface.

## Command Syntax

erps *DOMAINID* ring *DOMAINID* edge interface ( *IFPHYSICAL* | *IFAGG* )

no erps *DOMAINID* ring *DOMAINID* edge interface

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DOMAINID | ERPS domain ID | 1-255 |
| RINGID | ERPS ring ID | 1-255 |
| IFPHYSICAL | Ethernet interface name | - |
| IFAGG | Link aggregation interface name | - |

## Command Mode

Global Configuration

## Default

None

## Usage

Of the two ports via which the edge node (assistant-edge node) accesses the subring, one is a common port and the other is an edge port. The common port is the port for the edge node (assistant-edge node) to access the primary ring and the subring, while the edge port is the port for the edge node to access the subring only.

This command is only available for edge/assistant-edge node.

## Examples

This example shows how to set interface eth-0-9 as edge interface for ERPS domain 11 ring 1:

```
Switch# configure terminal
Switch(config)# interface eth-0-9
Switch(config-if)# switchport mode trunk
Switch(config-if)# switchport trunk allowed vlan add 15
Switch(config-if)# exit
Switch(config)# erps 11 ring 1 edge interface eth-0-9
```

## Related Commands

show erps

# 13.8.13 erps ring common interface

## Command Purpose

Use this command to set common interface for specific ERPS ring instance.

Use the no form of this command to set edge interface for specific ERPS ring instance.

## Command Syntax

erps *DOMAINID* ring *RINGID* common interface ( *IFPHYSICAL* | *IFAGG* )

no erps *DOMAINID* ring *RINGID* common interface

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DOMAINID | ERPS domain ID | 1-255 |
| RINGID | ERPS ring ID | 1-255 |
| IFPHYSICAL | Ethernet interface name | - |
| IFAGG | Link aggregation interface name | - |

## Command Mode

Global Configuration

## Default

None

## Usage

Of the two ports via which the edge node (assistant-edge node) accesses the subring, one is a common port and the other is an edge port. The common port is the port for the edge node (assistant-edge node) to access the primary ring and the subring, while the edge port is the port for the edge node to access the subring only.

This command is only available for edge/assistant-edge node.

## Examples

This example shows how to set interface eth-0-9 as edge interface for ERPS domain 11 ring 1:

```
Switch# configure terminal
Switch(config)# interface eth-0-9
Switch(config-if)# switchport mode trunk
Switch(config-if)# switchport trunk allowed vlan add 15
Switch(config-if)# exit
Switch(config)# erps 11 ring 1 common interface eth-0-9
```

## Related Commands

show erps

# 13.8.14 erps ring srpt

## Command Purpose

Use this command to enable/disable srpt functionality for specific ERPS ring instance.

## Command Syntax

erps *DOMAINID* ring *RINGID* srpt ( enable | disable )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DOMAINID | ERPS domain ID | 1-255 |
| RINGID | ERPS ring ID | 1-255 |
| enable | Enable the srpt | - |
| disable | Disable the srp | - |

## Command Mode

Global Configuration

## Default

None

## Usage

None

## Examples

This example shows how to enable srpt functionality for ERPS domain 11 ring 1:

```
Switch# configure terminal
Switch(config)# erps 11 ring 1 srpt enable
```

## Related Commands

show erps

# 13.8.15 erps ring enable

## Command Purpose

Use this command to enable specific erps ring instance.

## Command Syntax

erps *DOMAINID* ring *RINGID* enable

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DOMAINID | ERPS domain ID | 1-255 |
| RINGID | ERPS ring ID | 1-255 |

## Command Mode

Global Configuration

## Default

None

## Usage

Upon the specific ERPS ring is enabled successfully, the ring state should leave the idle state.

## Examples

This example shows how to enable ERPS domain 11 ring 1:

```
Switch# configure terminal
Switch(config)#erps 11 ring 1 enable
```

## Related Commands

show erps

# 13.8.16 erps ring disable

## Command Purpose

Use this command to disable specific erps ring instance.

## Command Syntax

erps *DOMAINID* ring *RINGID* disable

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DOMAINID | ERPS domain ID | 1-255 |
| RINGID | ERPS ring ID | 1-255 |

## Command Mode

Global Configuration

## Default

None

## Usage

Upon the specific ERPS ring is enabled successfully, the ring state should leave the idle state.

## Examples

This example shows how to disable ERPS domain 11 ring 1:

```
Switch# configure terminal
Switch(config)#erps 11 ring 1 disable
```

### Related Commands

show erps

## 13.8.17 erps enable

### Command Purpose

Use this command to enable specific ERPS domain instance.

### Command Syntax

erps *DOMAINID* enable

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DOMAINID | ERPS domain ID | 1-255 |

### Command Mode

Global Configuration

### Default

None

### Usage

Use this command to enable all the ring of the erps domain.

Enable the domain will make all the rings within the domain be enabled. Upon the specific ERPS ring is enabled successfully, the ring state should leave the idle state

### Examples

This example shows how to enable erps domain 11:

```
Switch#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#erps 11 enable
```

## Related Commands

show erps

# 13.8.18 erps disable

## Command Purpose

Use this command to disable specific erps domain instance.

## Command Syntax

erps *DOMAINID* disable

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DOMAINID | ERPS domain ID | 1-255 |

## Command Mode

Global Configuration

## Default

None

## Usage

Use this command to disable all the ring of the erps domain.

Enable the domain will make all the rings within the domain be enabled. Upon the specific ERPS ring is enabled successfully, the ring state should leave the idle state.

## Examples

This example shows how to disable erps domain 11:

```
Switch# configure terminal
Switch(config)# erps 11 disable
```

## Related Commands

show erps

## 13.8.19 erps mode rrpp

### Command Purpose

Use this command to compatible with RRPP.

### Command Syntax

erps mode rrpp

no erps mode rrpp

### Command Mode

Global Configuration

### Default

None

### Usage

This command to compatible with RRPP.

### Examples

This example shows how to compatible with RRPP:

```
Switch# configure terminal
Switch(config)# erps mode rrpp
```

### Related Commands

None

## 13.8.20 show erps

### Command Purpose

Use this command to show the configuration for specific erps domain.

## Command Syntax

show erps *DOMAINID*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DOMAINID | ERPS domain ID | 1-255 |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to display the configuration for erps domain 1:

```
Switch# show erps 1
ERPS domain ID: 1
ERPS domain name: ERPS001
ERPS domain mode: normal
ERPS domain primary control VLAN ID: 0
ERPS domain sub control VLAN ID: 0
ERPS domain hello timer interval: 1 second(s)
ERPS domain fail timer interval: 3 second(s)
```

## Related Commands

None

# 13.8.21 show erps list

## Command Purpose

Use this command to show the list of erps domain(s).

### Command Syntax

show erps list

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to display the erps domain list:

```
Switch# show erps list
ERPS Domain List
ID        Name
==============================
    11        ERPS0011
```

### Related Commands

None

## 13.8.22 clear erps counters

### Command Purpose

Use this command to clear the statistics for all domains or for single domain or for single ring.

### Command Syntax

clear erps counters ( all | ( domain *DOMAINID* ( | ring *RINGID* ) ) )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| all | All domain | - |
| domain DOMAINID | ERPS domain ID | 1-255 |
| ring RINGID | ERPS ring ID | 1-255 |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to clear all domain statistics:

```
Switch# clear erps counters all
```

### Related Commands

None

## 13.8.23 debug erps

### Command Purpose

Use this command to open the debug functions of ERPS.

### Command Syntax

debug erps ( all | dump | events )

no debug erps ( all | dump | events )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| all | all debug information | - |

| | | |
|---|---|---|
| dump | dump debug information | - |
| events | events debug information | - |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to open all debug functions:

```
Switch# debug erps all
```

### Related Commands

None

## 13.9 Smart-Link Commands

### 13.9.1 smart-link group

### Command Purpose

Use this command to create a smart-link group and enter smart-link group configuration mode. To destroy the smart-link group, used no form of this command.

### Command Syntax

smart-link group *GROUP-ID*

no smart-link group ( *GROUP-ID* | all )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| GROUP-ID | smart-link group ID | 1-16 |
| all | All the smart-link groups have been exist | - |

### Command Mode

Global Configuration

### Default

There is no any smart-link group

### Usage

Up to 16 smart-link groups can be created.

### Examples

Create a smart-link group with ID 1:

```
Switch# configure terminal
Switch(config)# smart-link group 1
```

### Related Commands

show smart-link group

## 13.9.2 smart-link relay enable

### Command Purpose

Use this command to enable the switch to relay the smart-link flush packet. To disable relaying the packets, use no form of this command.

### Command Syntax

smart-link relay enable

no smart-link relay enable

## Command Mode

Global Configuration

## Default

Relaying the smart-link flush packet is enabled.

## Usage

By default, the smart-link flush packet could be flooded. Use the command, "no smart-link relay enable", to disable the packet flooding to other switches.

## Examples

The example shows how to enable smart-link relay:

```
Switch# configure terminal
Switch(config)# smart-link relay enable
```

The example shows how to disable smart-link relay:

```
Switch# configure terminal
Switch(config)# no smart-link relay enable
```

## Related Commands

None

# 13.9.3 interface

## Command Purpose

Use this command to set master or slave member interface of the smart-link group. To unset the member, uses the no form of this command.

## Command Syntax

interface ( *IFPHYSICAL* | *IFAGG* ) ( master | slave )

no interface ( master | slave | all )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFPHYSICAL | The name of physical interface | - |
| IFAGG | The name of link-agg interface, like agg1 | - |
| master | The interface act as master role | - |
| slave | The interface act as slave role | - |

## Command Mode

Smart-link Configuration

## Default

There is no any interface member in the smart-link group by default.

## Usage

Every smart-link group has two member interfaces, master and slave. The interfaces should be physical (i.e. eth-0-1) or aggregator (i.e. agg1) switch interface.

STP must be disabled in the smart-link interfaces first.

## Examples

This example shows how to set interfaces eth-0-9 and eth-0-13 as the member interfaces of smart-link group 1:

```
Switch# configure terminal
Switch(config)# interface eth-0-9
Switch(config-if)# spanning-tree port disable
Switch(config-if)# exit
Switch(config)# interface eth-0-13
Switch(config-if)# spanning-tree port disable
Switch(config-if)# exit
Switch(config)# smart-link group 1
Switch(config-smlk-group)# interface eth-0-9 master
Switch(config-smlk-group)# interface eth-0-13 slave
Switch(config-smlk-group)# end
```

Display the smart link group just created:

```
Switch# show smart-link group 1
Smart-link group 1 information:
 The smart-link group was disabled.
 ============================================================
 Auto-restore:
   state       time            count    Last-time
   disabled      60              0      N/A
 ============================================================
 Protected instance:
 Load balance instance:
 ============================================================
 INTERFACE:
 Role     Member    DownCount Last-Down-Time  FlushCount Last-Flush-Time
 MASTER eth-0-9     0          N/A             0          N/A
 SLAVE  eth-0-13    0           N/A            0          N/A
```

## Related Commands

show smart-link group

# 13.9.4 protected mstp instance

## Command Purpose

Use this command to set protected MSTP instance to the smart-link group.

Use the no form of this command to unset protected MSTP instance.

## Command Syntax

protected mstp instance *INSTANCE-ID*

no protected mstp instance ( all | *INSTANCE-ID* )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INSTANCE-ID | MSTP instance ID. The range is 0-4094 | 0-4094 |
| all | All the instance have been exist | - |

## Command Mode

Smart-link Configuration

## Default

There is no protected MSTP instance in the smart-link group by default.

## Usage

The smart-link groups only protect these VLANs in the protected MSTP instances. The smart-link group can't be enabled if no protected instance is configured. To protect those VLANs which are not bound with MSTP instance, use the command "protected mstp instance 0".

NOTE: If the MTSP instance is removed, it will be removed from smart-link group at the same time.

## Examples

This example shows how to set MSTP instance 0, 10 and 100 to the smart-link group 1:

```
Switch# configure terminal
Switch(config)# smart-link group 1
Switch(config-smlk-group)# protected mstp instance 0
Switch(config-smlk-group)# protected mstp instance 10
Switch(config-smlk-group)# protected mstp instance 100
Switch(config-smlk-group)# end
Switch# show smart-link group 1
Smart-link group 1 information:
 The smart-link group was disabled.
 ============================================================
 Auto-restore:
   state       time            count    Last-time
  disabled     60              0       N/A
 ============================================================
 Protected instance: 0  100  10
 Load balance instance:
 ============================================================
 INTERFACE:
 Role       Member    DownCount Last-Down-Time  FlushCount Last-Flush-Time
 MASTER   eth-0-9     0          N/A             0          N/A
 SLAVE     eth-0-13    0          N/A             0          N/A
```

## Related Commands

show smart-link group

## 13.9.5 load-balance instance

### Command Purpose

Use this command to set load-balancing instance to the smart-link group.

Use this command to unset load-balancing instance.

### Command Syntax

load-balance instance *INSTANCE-ID*

no load-balance instance ( all | *INSTANCE-ID* )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INSTANCE-ID | MSTP instance ID. The range is 0-4094 | 0-4094 |
| all | All the instance have been exist | - |

### Command Mode

Smart-link Configuration

### Default

There is no load-balancing instance in the smart-link group by default.

### Usage

Load-balancing instances will be active in the slave interface. If user want to configure load-balancing instances, should before the smart-group is enabled.

### Examples

This example shows how to set protected instance 10 as the load-balancing instance:

```
Switch# configure terminal
Switch(config)# smart-link group 1
Switch(config-smlk-group)# load-balance instance 10
```

## Related Commands

show smart-link group

# 13.9.6 restore time

## Command Purpose

Use this command to set restore time of the smart-link group.

Use the no form of this command to restore the default value.

## Command Syntax

restore time *RESTORE-TIME*

no restore time

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| RESTORE-TIME | The restore time of the smart-link group | 30-1200 seconds |

## Command Mode

Smart-link Configuration

## Default

The default restore time is 60 seconds.

## Usage

When the master interface is resumed, the links will not be immediately restored to the master interface, but will be delayed a while. The delay time is called restore time.

## Examples

This example shows how to set restore time as 30 seconds in the smart-link group 1:

```
Switch# configure terminal
Switch(config)# smart-link group 1
Switch(config-smlk-group)# restore time 30
```

### Related Commands

show smart-link group

## 13.9.7 restore enable

### Command Purpose

Use this command to enable/disable restoring feature of the smart-link group.

### Command Syntax

restore enable

no restore enable

### Command Mode

Smart-link Configuration

### Default

The restoring feature of the smart-link group is disabled by default.

### Usage

When master interface fails, the link will be switched to the slave interface. Then, if master interface is resumed, the link will not be switched back to keep the flow stable by default. If restoring feature is enabled, the link will be switched back.

NOTE: If load-balancing instance is configured, this feature is recommended strongly.

### Examples

This example shows how to enable the restoring feature in the smart-link group 1:

```
Switch# configure terminal
Switch(config)# smart-link group 1
Switch(config-smlk-group)# restore enable
```

### Related Commands

show smart-link group

## 13.9.8 flush send

### Command Purpose

Use this command to set/unset the flush packet sender in the smart-link group.

### Command Syntax

flush send control-vlan *VLAN-ID* ( password simple *PASSWORD* | )

no flush send

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN-ID | Flush packet will be sent through this VLAN. | 1-4094 |
| PASSWORD | The simple password of the flush packet | String with up to 15 characters |

### Command Mode

Smart-link Configuration

### Default

There is no flush sender in the smart-link group by default.

### Usage

Mac address-table should be updated when a master (forwarding) link goes down and the slave link begins forwarding traffic. Flush packet is used for this purpose.

NOTE: If the control-vlan is not existed in the switch, sending flush packet will fail.

## Examples

This example shows how to configure flush sender of the smart-link group 1, control-vlan is 4 and password is “test”:

```
Switch# configure terminal
Switch(config)# smart-link group 1
Switch(config-smlk-group)# flush send control-vlan 4 password simple test
```

## Related Commands

show smart-link group

smart-link flush receive

# 13.9.9 group enable

## Command Purpose

Use this command to enable/disable the smart-link group.

## Command Syntax

group enable

no group enable

## Command Mode

Smart-link Configuration

## Default

Smart-link group is disabled by default.

## Usage

After interface and protected instance configuration is finished, this command could be used to enable the group.

## Examples

This example shows how to enable the smart-link group 1:

```
Switch# configure terminal
Switch(config)# smart-link group 1
Switch(config-smlk-group)# group enable
```

## Related Commands

show smart-link group

# 13.9.10 smart-link flush receive

## Command Purpose

Use this command to set/unset the flush packet receiver in the switch interface.

## Command Syntax

smart-link flush receive control-vlan *VLAN_LIST* ( password simple *PASSWORD* | ) ( vpls-notify | )

no smart-link flush receive ( control-vlan *VLAN_LIST* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_LIST | Flush packet will be sent through these VLANs. | VLAN ID list, example: 2-5,7,9-11, range is 1-4094 |
| PASSWORD | The simple password of the flush packet | String with up to 15 characters |
| vpls-notify | Flush packet is used for vpls. | - |

## Command Mode

Interface Configuration

## Default

There is no flush receiver by default.

### Usage

The received flush packet should have the same VLAN-ID and password with the sender. Otherwise, the packet will be discarded.

### Examples

This example shows how to configure flush receiver in the interface eth-0-9, control-vlan is 4 and password is “test”:

```
Switch# configure terminal
Switch(config)# interface eth-0-9
Switch(config-if)# smart-link flush receive control-vlan 4 password simple test
Switch(config-if)# end
Switch# show smart-link
Relay smart-link flush packet is enabled
 Smart-link received flush packet number:0
 Smart-link processed flush packet number:0
 Smart link Group Number is 1.
  Group-ID    State       MASTER        SLAVE
  1           disabled     N/A             N/A
```

### Related Commands

flush send

show smart-link

## 13.9.11 smart-link tcn enable

### Command Purpose

Use this command to enable smart link tcn. To disable the smart-link tcn, used no form of this command.

### Command Syntax

smart-link tcn enable

no smart-link tcn enable

### Command Mode

Global Configuration

## Default

Disable

## Usage

None

## Examples

```
Switch# configure terminal
Switch(config)# no smart-link tcn enable

Switch# configure terminal
Switch(config)# smart-link tcn enable
```

## Related Commands

show smart-link

# 13.9.12 smart-link tcn query-count

## Command Purpose

Use this command to set smart link tcn query count. To reset the smart-link tcn query count to default value, used no form of this command.

## Command Syntax

smart-link tcn query-count *QUERY-COUNT*

no smart-link tcn query-count

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| QUERY-COUNT | TCN query count. | 1-10 |

## Command Mode

Global Configuration

## Default

2

## Usage

None

## Examples

This example shows how to set smart link tcn query count to 5:

```
Switch# configure terminal
Switch(config)# smart-link tcn query-count 5
```

## Related Commands

show smart-link

# 13.9.13 smart-link tcn query-interval

## Command Purpose

Use this command to set smart link tcn query interval. To reset the smart-link tcn query interval to default value, used no form of this command.

## Command Syntax

smart-link tcn query-interval *QUERY-INTERVAL*

no smart-link tcn query-interval

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| QUERY-INTERVAL | TCN query interval. | 1-255 seconds |

## Command Mode

Global Configuration

## Default

10s

## Usage

None

## Examples

This example shows how to set smart link tcn query interval to 50:

```
Switch# configure terminal
Switch(config)# smart-link tcn query-interval 50

Switch# configure terminal
Switch(config)# no smart-link tcn query-interval
```

## Related Commands

show smart-link

# 13.9.14 show smart-link

## Command Purpose

Use this command to display information of all smart-link groups.

## Command Syntax

show smart-link

## Command Mode

Privileged EXEC

## Default

None

## Usage

This command is used to display summary information of Smart-link group status, including received flush packet, processed flush packet and current Smart-link group number, etc.

### Examples

```
Switch# show smart-link
Relay smart-link flush packet is enabled
  Smart-link received flush packet number:7
  Smart-link processed flush packet number:0
  Smart link Group Number is 1.
  Group-ID    State       MASTER        SLAVE
  1           enabled     eth-0-1          eth-0-2
```

### Related Commands

None

## 13.9.15 show smart-link group

### Command Purpose

Use this command to display detailed information of all smart-link groups or a specific group.

### Command Syntax

show smart-link group ( *GROUP-ID* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| GROUP-ID | Smart-link group ID | 1-16 |

### Command Mode

Privileged EXEC

### Default

None

### Usage

This command is used to display detail information of a specified Smart-link group or all Smart-link groups' status.

### Examples

```
Switch# show smart-link group 1
```

### Related Commands

None

## 13.9.16 clear smart-link statistic

### Command Purpose

Use this command to clear the statistic of the smart-link groups.

### Command Syntax

clear smart-link statistic

### Command Mode

Privileged EXEC

### Default

None

### Usage

This command is used to clear the statistic of the smart-link groups.

### Examples

```
Switch# clear smart-link statistic
```

### Related Commands

None

# 13.9.17 debug smart-link

## Command Purpose

Use this command to debug detail information of smart link.

## Command Syntax

debug smart-link ( all | flush | instance | interface | restore )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| all | All debugging | - |
| flush | Smart-Link Flush Packet | - |
| instance | Smart-Link Instance | - |
| interface | Smart-Link Interface | - |
| restore | Smart-Link auto-restore | - |
| mib | SNMP MIBs of Smart-Link | - |
| trap | SNMP trap of Smart-Link | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

```
Switch# debug smart-link all
```

## Related Commands

None

# 13.10 Multi-Link Commands

## 13.10.1 multi-link group

### Command Purpose

Use this command to create a multi-link group and enter multi-link group configuration mode. To destroy the multi-link group, used no form of this command.

### Command Syntax

multi-link group *GROUP-ID*

no multi-link group ( *GROUP-ID* | all )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| GROUP-ID | multi-link group ID | 1-16 |
| all | All the multi-link groups have been exist | - |

### Command Mode

Global Configuration

### Default

There is no any multi-link group

### Usage

Up to 16 multi-link groups can be created.

### Examples

Create a multi-link group with ID 1:

```
Switch# configure terminal
Switch(config)# multi-link group 1
```

### Related Commands

show multi-link group

## 13.10.2 multi-link relay enable

### Command Purpose

Use this command to enable the switch to relay the multi-link flush packet. To disable relaying the packets, use no form of this command.

### Command Syntax

multi-link relay enable

no multi-link relay enable

### Command Mode

Global Configuration

### Default

Relaying the multi-link flush packet is enabled.

### Usage

By default, the multi-link flush packet could be flooded. Use the command, “no multi-link relay enable”, to disable the packet flooding to other switches.

### Examples

The example shows how to enable multi-link relay:

```
Switch# configure terminal
Switch(config)#  multi-link relay enable
```

The example shows how to disable multi-link relay:

```
Switch# configure terminal
Switch(config)# no multi-link relay enable
```

### Related Commands

None

## 13.10.3 interface

### Command Purpose

Use this command to set master or slave member interface of the multi-link group. To unset the member uses the no form of this command.

### Command Syntax

interface ( *IFPHYSICAL* | *IFAGG* ) priority <1-4>

no interface ( priority <1-4> | all )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFPHYSICAL | The name of physical interface, like eth-0-1 | - |
| IFAGG | The name of link-agg interface, like agg1 | - |
| <1-4> | The priority of the interface | 1-4 |
| all | Both of the master and slave interface | - |

### Command Mode

Multi-link Group Configuration

### Default

There is no any interface member in the multi-link group by default.

### Usage

Every multi-link group has more than two member interfaces. The interfaces should be physical (i.e. eth-0-1) or aggregator (i.e. agg1) switch interface.

NOTE: STP must be disabled in the multi-link interfaces first.

### Examples

This example shows how to set interfaces eth-0-9 and eth-0-13 as the interfaces of multi-link group 1:

```
Switch# configure terminal
Switch(config)# interface eth-0-9
Switch(config-if)# spanning-tree port disable
Switch(config-if)# exit
Switch(config)# interface eth-0-13
Switch(config-if)# spanning-tree port disable
Switch(config-if)# exit
Switch(config)# multi-link group 1
Switch(config-multilk-group)# interface eth-0-9 master
Switch(config-multilk-group)# interface eth-0-13 slave
Switch(config-multilk-group)# end
Switch# show multi-link group 1
Multi-link group 1 information:
 The multi-link group was disabled.
 ============================================================
 Auto-restore:
   state       time            count    Last-time
   disabled      60               0      N/A
 ============================================================
 Protected instance:
 Load balance instance:
 ============================================================
 INTERFACE:
 Role     Member    DownCount Last-Down-Time  FlushCount Last-Flush-Time
 MASTER eth-0-9     0          N/A             0          N/A
 SLAVE  eth-0-13    0           N/A            0          N/A
```

## Related Commands

show multi-link group

# 13.10.4 protected mstp instance

## Command Purpose

Use this command to set/unset protected MSTP instance to the multi-link group.

## Command Syntax

protected mstp instance *INSTANCE-ID*

no protected mstp instance ( all | *INSTANCE-ID* )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INSTANCE-ID | MSTP instance ID. The range is 0-4094 | 0-4094 |
| all | All the instance have been exist | - |

## Command Mode

Multi-link Group Configuration

## Default

There is no protected MSTP instance in the multi-link group by default.

## Usage

The multi-link groups only protect these VLANs in the protected MSTP instances. The multi-link group can't be enabled if no protected instance is configured. To protect those VLANs which are not bound with MSTP instance, use the command "protected mstp instance 0".

NOTE: If the MTSP instance is removed, it will be removed from multi-link group at the same time.

## Examples

This example shows how to set MSTP instance 0, 10 and 100 to the multi-link group 1:

```
Switch# configure terminal
Switch(config)# multi-link group 1
Switch(config-multilk-group)# protected mstp instance 0
Switch(config-multilk-group)# protected mstp instance 10
Switch(config-multilk-group)# protected mstp instance 100
Switch(config-multilk-group)# end
Switch# show multi-link group 1
Multi-link group 1 information:
 The multi-link group was enabled.
 ============================================================
 Auto-restore:
   state       time            count    Last-time
   disabled      60               0      N/A
 ============================================================
 Protected instance: 0  10  100
 Load balance instance:
 ============================================================
 INTERFACE:
 Role   Member    DownCount Last-Down-Time      FlushCount Last-Flush-Time
 PRI1   eth-0-9   0         N/A                 0          N/A
 PRI2   eth-0-10  0         N/A                 0          N/A
 PRI3   N/A       0         N/A                 0          N/A
 PRI4   eth-0-12  0         N/A                 0          N/A
 ============================================================
```

```
Instance states in the member interfaces:
  A - ACTIVE ,   B -BLOCK  , D-The interface is link-down
Map-instance-ID  P1(eth-0-9 )  P2(eth-0-10)  P3(N/A     )  P4(eth-0-12)
0                A             B             D             B
10               A             B             D             B
100              A             B             D             B
```

### Related Commands

show multi-link group

## 13.10.5 load-balance instance

### Command Purpose

Use this command to set/unset load-balancing to the multi-link group.

### Command Syntax

load-balance instance *INSTANCE-ID* priority <2-4>

no load-balance instance ( all | *INSTANCE-ID* )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INSTANCE-ID | MSTP instance ID. The range is 0-4094 | 0-4094 |
| <2-4> | Set load-balancing port with same priority | - |
| all | All the instance have been exist | - |

### Command Mode

Multi-link Group Configuration

### Default

There is no load-balancing instance in the multi-link group by default.

### Usage

Load-balancing instances will be active in the slave interface. If user want to configure load-balancing instances, should before the smart-group is enabled.

## Examples

This example shows how to set protected instance 10 as the load-balancing instance:

```
Switch# configure terminal
Switch(config)# multi-link group 1
Switch(config-multilk-group)# load-balance instance 10 priority 2
```

## Related Commands

show multi-link group

# 13.10.6 restore time

## Command Purpose

Use this command to set restore time of the multi-link group.

## Command Syntax

restore time *RESTORE-TIME*

no restore time

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| RESTORE-TIME | The restore time of the multi-link group | 30-1200 seconds |

## Command Mode

Multi-link Group Configuration

## Default

The default restore time is 60 seconds.

## Usage

When the master interface is resumed, the links will not be immediately restored to the master interface, but will be delayed a while. The delay time is called restore time.

### Examples

This example shows how to set restore time as 30 seconds in the multi-link group 1:

```
Switch# configure terminal
Switch(config)# multi-link group 1
Switch(config-multilk-group)# restore time 30
```

### Related Commands

show multi-link group

## 13.10.7 restore enable

### Command Purpose

Use this command to enable/disable restoring feature of the multi-link group.

### Command Syntax

restore enable

no restore enable

### Command Mode

Multi-link Group Configuration

### Default

The restoring feature of the multi-link group is disabled by default.

### Usage

When master interface fails, the link will be switched to the slave interface. Then, if master interface is resumed, the link will not be switched back to keep the flow stable by default. If restoring feature is enabled, the link will be switched back.

NOTE: If load-balancing instance is configured, this feature is recommended strongly.

## Examples

This example shows how to enable the restoring feature in the multi-link group 1:

```
Switch# configure terminal
Switch(config)# multi-link group 1
Switch(config-multilk-group)# restore enable
```

## Related Commands

show multi-link group

# 13.10.8 flush send

## Command Purpose

Use this command to set/unset the flush packet sender in the multi-link group.

## Command Syntax

flush send control-vlan *VLAN-ID* password simple *PASSWORD*

no flush send

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN-ID | Flush packet will be sent through this VLAN. | 1-4094 |
| PASSWORD | The simple password of the flush packet | String with up to 15 characters |

## Command Mode

Multi-link Group Configuration

## Default

There is no flush sender in the multi-link group by default.

## Usage

Mac address-table should be updated when a master (forwarding) link goes down and the slave link begins forwarding traffic. Flush packet is used for this purpose.

NOTE: If the control-vlan is not existed in the switch, sending flush packet will fail.

### Examples

This example shows how to configure flush sender of the multi-link group 1, control-vlan is 4 and password is “test”:

```
Switch# configure terminal
Switch(config)# multi-link group 1
Switch(config-multilk-group)# flush send control-vlan 4 password simple test
```

### Related Commands

show multi-link group

multi-link flush receive

## 13.10.9 group enable

### Command Purpose

Use this command to enable/disable the multi-link group.

### Command Syntax

group enable

no group enable

### Command Mode

Multi-link Group Configuration

### Default

Multi-link group is disabled by default.

### Usage

After interface and protected instance configuration is finished, this command could be used to enable the group.

## Examples

This example shows how to enable the multi-link group 1:

```
Switch# configure terminal
Switch(config)# multi-link group 1
Switch(config-multilk-group)# group enable
```

## Related Commands

show multi-link group

# 13.10.10 multi-link flush receive

## Command Purpose

Use this command to set/unset the flush packet receiver in the switch interface.

## Command Syntax

multi-link flush receive control-vlan *VLAN-ID* password simple *PASSWORD*

no multi-link flush receive

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN-ID | Flush packet will be sent through this VLAN. | 1-4094 |
| PASSWORD | The simple password of the flush packet | String with up to 15 characters |

## Command Mode

Interface Configuration

## Default

There is no flush receiver by default.

## Usage

The received flush packet should have the same VLAN-ID and password with the sender. Otherwise, the packet will be discarded.

## Examples

This example shows how to configure flush receiver in the interface eth-0-9, control-vlan is 4 and password is “test”:

```
Switch# configure terminal
Switch(config)# interface eth-0-9
Switch(config-if)# multi-link flush receive control-vlan 4 password simple test
Switch(config-if)# end
Switch# show multi-link
Relay multi-link flush packet is enabled
Multi-link received flush packet number:0
Multi-link processed flush packet number:0
Multi-link tcn is enabled
Multi-link tcn query count    :2
Multi-link tcn query interval :3
Multi-link Group Number is 1.
Group-ID    State       Pri-1      Pri-2      Pri-3      Pri-4
1         enabled     eth-0-9    eth-0-10   N/A        eth-0-12
```

## Related Commands

flush send

show multi-link

# 13.10.11 multi-link tcn enable

## Command Purpose

Use this command to enable multi-link tcn. To disable the multi-link tcn, used no form of this command.

## Command Syntax

multi-link tcn enable

no multi-link tcn enable

## Command Mode

Global Configuration

### Default

Disable

### Usage

None

### Examples

```
Switch# configure terminal
Switch(config)# multi-link tcn enable

Switch# configure terminal
Switch(config)# no multi-link tcn enable
```

### Related Commands

show multi-link

## 13.10.12 multi-link tcn query-count

### Command Purpose

Use this command to set multi-link tcn query count. To reset the multi-link tcn query count to default value, used no form of this command.

### Command Syntax

multi-link tcn query-count *QUERY-COUNT*

no multi-link tcn query-count

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| QUERY-COUNT | TCN query count. | 1-10 |

### Command Mode

Global Configuration

### Default

2

### Usage

None

### Examples

This example shows how to set multi-link tcn query count to 5:

```
Switch# configure terminal
Switch(config)# multi-link tcn query-count 5
```

### Related Commands

show multi-link

## 13.10.13 multi-link tcn query-interval

### Command Purpose

Use this command to set multi-link tcn query interval. To reset the multi-link tcn query interval to default value, used no form of this command.

### Command Syntax

multi-link tcn query-interval *QUERY-INTERVAL*

no multi-link tcn query-interval

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| QUERY-INTERVAL | TCN query interval. | 1-255 seconds |

### Command Mode

Global Configuration

### Default

10s

## Usage

None

## Examples

This example shows how to set multi-link tcn query interval to 50:

```
Switch# configure terminal
Switch(config)# multi-link tcn query-interval 50
```

This example shows how to restore the default multi-link tcn query interval to 50:

```
Switch# configure terminal
Switch(config)# no multi-link tcn query-interval
```

## Related Commands

show multi-link

# 13.10.14 show multi-link

## Command Purpose

Use this command to display information of all multi-link groups.

## Command Syntax

show multi-link

## Command Mode

Privileged EXEC

## Default

None

## Usage

This command is used to display a summary information of Multi-link group status, including received flush packet, processed flush packet and current Multi-link group number , etc.

## Examples

```
Switch# show multi-link
Relay multi-link flush packet is enabled
Multi-link received flush packet number:0
Multi-link processed flush packet number:0
Multi-link tcn is enabled
Multi-link tcn query count    :2
Multi-link tcn query interval :3
Multi-link Group Number is 1.
Group-ID    State       Pri-1      Pri-2      Pri-3      Pri-4
1         enabled     eth-0-9    eth-0-10   N/A        eth-0-12
```

## Related Commands

None

# 13.10.15 show multi-link group

## Command Purpose

Use this command to display detailed information of all multi-link groups or a specific group.

## Command Syntax

show multi-link group ( *GROUP-ID* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| GROUP-ID | Multi-link group ID | 1-16 |

## Command Mode

Privileged EXEC

### Default

None

### Usage

This command is used to display detail information of a specified Multi-link group or all Multi-link groups' status.

### Examples

```
Switch# show multi-link group 1
```

### Related Commands

None

## 13.10.16 clear multi-link statistic

### Command Purpose

Use this command to clear the statistic of the multi-link groups.

### Command Syntax

clear multi-link statistic

### Command Mode

Privileged EXEC

### Default

None

### Usage

This command is used to clear the statistic of the multi-link groups.

### Examples

```
Switch# clear multi-link statistic
```

### Related Commands

None

## 13.10.17 debug multi-link

### Command Purpose

Use this command to debug detail information of multi-link.

### Command Syntax

debug multi-link ( all | flush | instance | interface | restore )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| all | All debugging | - |
| flush | Multi-link Flush Packet | - |
| instance | Multi-link Instance | - |
| interface | Multi-link Interface | - |
| restore | Multi-link auto-restore | - |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

```
Switch# debug multi-link all
```

## Related Commands

None

# 13.10.18 multilink-enhance interface

## Command Purpose

Use this command to set/unset the multilink enhance interface which sends enhanced packets in the multi-link group.

## Command Syntax

multilink-enhance interface ( *IFPHYSICAL* | *IFAGG* )

no multilink-enhance interface

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFPHYSICAL | The name of physical interface, like eth-0-1 | - |
| IFAGG | The name of link-agg interface, like agg1 | - |

## Command Mode

Multi-link Group Configuration

## Default

There is no flush sender in the multi-link group by default.

## Usage

The interface of multilink-enhance is generally out of multi-link group, when you want to configure multilink-enhance interface , you should set the control vlan id and password of flush send.

## Examples

This example shows how to configure multilink-enhance of multi-link group 1:

```
Switch# configure terminal
Switch(config)# multi-link group 1
Switch(config-multilk-group)# multilink-enhance interface eth-0-1
```

## Related Commands

show multi-link group

# 13.10.19 multilink-enhance receive

## Command Purpose

Use this command to set/unset the multilink enhance interface which receives enhanced packets in multi-link group.

## Command Syntax

multilink-enhance receive control-vlan *VLAN-ID* password simple *PASSWORD* interface ( *IFPHYSICAL* | *IFAGG* )

no multilink-enhance receive interface ( *IFPHYSICAL* | *IFAGG* )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| control-vlan VLAN-ID | The VLAN ID of multi-link control vlan | 1-4094 |
| password simple PASSWORD | The simple password | String with up to 15 characters |
| IFPHYSICAL | The name of physical interface, like eth-0-1 | - |
| IFAGG | The name of link-agg interface, like agg1 | - |

## Command Mode

Multi-link Group Configuration

## Default

There is no flush sender in the multi-link group by default.

## Usage

The received interface of multilink-enhance must be the member of multi-link group with the lowest priority. When the interface enabling receiving enhanced packets, it should not be set the load-balance, and doesn't add the lower priority interface in multi-link group.

## Examples

This example shows how to configure multilink-enhance received interface of multi-link group 1:

```
Switch# configure terminal
Switch(config)# multi-link group 1
Switch(config-multilk-group)# multilink-enhance receive control-vlan 10 password b
interface eth-0-2
```

## Related Commands

show multi-link group

# 13.10.20 multilink-enhance send-interval

## Command Purpose

Use this command to set the interval of sending enhance packets.

## Command Syntax

multilink-enhance send-interval <1-255>

no multilink-enhance send-interval

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| <1-255> | The interval of sending enhance packets | 1-255 |

## Command Mode

Multi-link Group Configuration

## Default

10

## Usage

NONE.

## Examples

This example shows how to configure the interval of sending enhance packets, its value is 20:

```
Switch# configure terminal
Switch(config)# multi-link group 1
Switch(config-multilk-group)# multilink-enhance send-interval 20
```

## Related Commands

show multi-link group

# 13.10.21 multilink-enhance timeout

## Command Purpose

Use this command to set the interval of checking received enhance packets.

## Command Syntax

multilink-enhance timeout <1-255>

no multilink-enhance timeout

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| <1-255> | The interval of checking received enhance packets | 1-255 |

## Command Mode

Multi-link Group Configuration

### Default

10

### Usage

NONE.

### Examples

This example shows how to configure the interval of checking received enhance packets, its value is 20:

```
Switch# configure terminal
Switch(config)# multi-link group 1
Switch(config-multilk-group)# multilink-enhance timeout 20
```

### Related Commands

show multi-link group

## 13.11 Monitor Link Commands

### 13.11.1 monitor-link group

### Command Purpose

Use this command to create monitor link group.

### Command Syntax

monitor link group *GROUP-ID*

no monitor link group *GROUP-ID*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| GROUP-ID | Monitor link group number | 1-16 |

### Command Mode

Global Configuration

### Default

No monitor link group is created

### Usage

This command is used to create monitor link group. The group range is 1-16.

### Examples

In the following example, monitor link group 1 is created:

```
Switch# configure terminal
Switch(config)# monitor-link group 1
```

### Related Commands

no monitor-link group

## 13.11.2 monitor-link uplink interface

### Command Purpose

Use this command to add uplink interface to monitor link group.

### Command Syntax

monitor-link uplink interface ( *IFPHYSICAL* | *IFAGG* )

no monitor-link uplink interface ( *IFPHYSICAL* | *IFAGG* )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFPHYSICAL | Ethernet interface name | - |
| IFAGG | Link aggregation interface name | - |

### Command Mode

Monitor-link Configuration

### Default

No interface is add

### Usage

Only Ethernet interface and aggregation interface can be used as monitor link group.

### Examples

In the following example, the ethernet interface is set to monitor link group member:

```
Switch# configure terminal
Switch(config)# monitor-link group 1
Switch(config-mtlk-group)# monitor-link uplink interface eth-0-1
```

### Related Commands

show monitor-link group

## 13.11.3 monitor-link uplink smart-link group

### Command Purpose

Use this command to add smart link group to monitor link group.

### Command Syntax

monitor-link uplink smart-link group *GROUP-ID*

no monitor-link uplink smart-link group *GROUP-ID*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| GROUP-ID | Monitor link group number | 1-16 |

### Command Mode

Monitor-link Configuration

### Default

No smart link group is add

### Usage

Only the smart link group which is enabled can be add to monitor link group

### Examples

In the following example, the smart link group is set to monitor link group member:

```
Switch# configure terminal
Switch(config)# monitor-link group 1
Switch(config-mtlk-group)# monitor-link uplink smart-link group 1
```

### Related Commands

show monitor-link group

## 13.11.4 no monitor-link uplink

### Command Purpose

Use this command to delete all the uplink from monitor link group.

### Command Syntax

no monitor-link uplink

### Command Mode

Monitor-link Configuration

### Default

None

### Usage

This command is used to delete all the uplink from monitor link group.

### Examples

In the following example, all the uplink is deleted from monitor link group:

```
Switch# configure terminal
Switch(config-mtlk-group)# no monitor-link uplink
```

### Related Commands

show monitor-link group

## 13.11.5 monitor-link downlink interface

### Command Purpose

Use this command to add downlink interface from monitor link group.

### Command Syntax

monitor-link downlink interface ( *IFPHYSICAL* | *IFAGG* )

no monitor-link downlink interface ( *IFPHYSICAL* | *IFAGG* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFPHYSICAL | Ethernet interface name | - |
| IFAGG | Link aggregation interface name | - |

### Command Mode

Monitor-link Configuration

### Default

No interface is add

### Usage

Only Ethernet interface and aggregation interface can be add to monitor link group.

### Examples

In the following example, the Ethernet interface is set to monitor link group member:

```
Switch# configure terminal
Switch(config)# monitor-link group 1
Switch(config-mtlk-group)# monitor-link downlink interface eth-0-1
```

### Related Commands

show monitor-link group

## 13.11.6 monitor-link recover-time

### Command Purpose

Use this command to set recover time for monitor link group.

### Command Syntax

monitor-link recover-time *RECOVER_TIME*

no monitor-link recover-time

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| RECOVER_TIME | Monitor link group recover time range (second) | 0-60 seconds |

### Command Mode

Global Configuration

### Default

The default value is 3 seconds

### Usage

This command is used to set recover time for monitor link group. If the uplink is change to up, all the downlink will be set to up after recover timer.

### Examples

In the following example, monitor link group's recover-time is set to 1s:

```
Switch# configure terminal
Switch(config)# monitor-link recover-time 1
```

### Related Commands

show monitor-link group

## 13.11.7 show monitor-link group

### Command Purpose

Use this command to display all the monitor link group status.

### Command Syntax

show monitor-link group ( *GROUP-ID* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| GROUP-ID | Monitor link group number | 1-16 |

### Command Mode

Privileged EXEC

### Default

None

### Usage

This command is used to display a specified or all the monitor link group status, including status, group id, uptime, downtime, etc.

### Examples

In the following example, monitor link group 1 is displayed:

```
Switch# show monitor-link group
Group Id: 1
Monitor link status: UP
Role      Member       Last-up-time          Last-down-time          upcount
downcount
UpLk 1    eth-0-2      2011/07/15,01:34:17  2011/07/15,01:34:14     1          1
```

### Related Commands

None

## 13.11.8 debug monitor-link

### Command Purpose

Use this command to debug monitor link.

### Command Syntax

debug monitor-link

### Command Mode

Privileged EXEC

### Default

None.

### Usage

None.

### Examples

In the following example, the debug of monitor link is set to on:

```
Switch# debug monitor-link
```

### Related Commands

None

# 13.12 VRRP Commands

## 13.12.1 advertisement-interval

### Command Purpose

To configure the interval between successive advertisements sent by the master virtual router in a Virtual Router Redundancy Protocol (VRRP) group, use the advertisement-interval command in router configuration mode. To restore the default value, use the no form of this command.

### Command Syntax

advertisement-interval interval

no advertisement-interval

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INTERVAL | Time interval between successive advertisements sent by the master virtual router. The unit of the interval is in seconds. | 1-255 seconds |

### Command Mode

Router Configuration

### Default

Default is 1 second.

### Usage

The advertisements sent by the master virtual router communicate the state and priority of the current master virtual router.

The advertisement-interval command configures the time between successive advertisement packets and the time before other routers declare the master router to be down. Routers or access servers on which timer value are not configured can learn timer values from the master router. The timers configured on the master

router always override any other timer settings. All routers in a VRRP group must use the same timer value. If the same timer value is not set, the routers in the VRRP group will not communicate with each other and any misconfigured router will change its state to master.

### Examples

The following example shows how to configure the master virtual router to send advertisements every 4 seconds:

```
Switch# configure terminal
Switch(config)# router vrrp 1
Switch(config-router)# advertisement-interval 4
```

### Related Commands

advertisement-interval msec

## 13.12.2 advertisement-interval msec

### Command Purpose

To configure the advertisement interval with milli-second mode between successive advertisements sent by the master virtual router in a VRRP group, use the advertisement-interval msec command in router configuration mode.

### Command Syntax

advertisement-interval msec interval

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INTERVAL | Time interval between successive advertisements sent by the master virtual router. The unit of the interval is in 100 milli-seconds. | 100-900 milli-seconds. |

### Command Mode

Router Configuration

## Default

None

## Usage

The advertisements be sent by the master virtual router communicate the state and priority of the current master virtual router.

The advertisement-interval msec command configures the time between successive advertisement packets and the time before other routers declare the master router to be down. Routers or access servers on which timer values are not configured can learn timer values from the master router. The timers configured on the master router always override any other timer settings. All routers in a VRRP group must use the same timer value. If the same timer value is not set, the routers in the VRRP group will not communicate with each other and any misconfigured router will change its state to master.

## Examples

The following example shows how to configure the master virtual router to send advertisements every 100 milli-seconds:

```
Switch# configure terminal
Switch(config)# router vrrp 1
Switch(config-router)# advertisement-interval msec 100
```

## Related Commands

advertisement-interval

# 13.12.3 compatible-version

## Command Purpose

To configure advertisement packet send mode of VRRP v3, use the compatible-version command in router configuration mode. To restore the default value, use the no form of this command.

## Command Syntax

compatible-version ( 2 | 3 | all )

no compatible-version

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| 2 | Only send VRRP v2 advertisement packet | - |
| 3 | Only send VRRP v3 advertisement packet | - |
| all | Send both VRRP v2 and v3 advertisement packet | - |

## Command Mode

Router Configuration

## Default

Default is 3.

## Usage

Only can configure for VRRP v3 IPv4 router。

## Examples

The following example shows how to configure the master virtual router to send both v2 and v3 advertisement packet:

```
Switch# configure terminal
Switch(config)# vrrp version 3
Switch(config)# router vrrp 1
Switch(config-router)# compatible-version all
```

## Related Commands

vrrp version

## 13.12.4 interface (VRRP)

### Command Purpose

To enable the Virtual Router Redundancy Protocol (VRRP) protocol on a specified interface, use the interface command in router mode.

To disable VRRP protocol on this interface, use the no form of this command.

### Command Syntax

interface *INTERFACE-ID*

no interface

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INTERFACE-ID | Interface name | - |

### Command Mode

Router Configuration

### Default

None

### Usage

The max VRRP group number should be no more than 3 for one VRRP interface.

### Examples

The following is a sample output from the interface command:

```
Switch# configure terminal
Switch(config)#router vrrp 1
Switch(config-router)#interface eth-0-1
```

### Related Commands

router vrrp

## 13.12.5 learnmaster-mode

### Command Purpose

To enable the backup router to learn advertisement interval from master router, use the learnmaster-mode true command in router mode.

To disable learn advertisement interval from master router, use the learnmaster-mode false command.

### Command Syntax

learnmaster-mode ( true | false )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| True | Enable learn advertisement interval from master router | - |
| False | Disable learning advertisement interval from master router | - |

### Command Mode

Router Configuration

### Default

Default is false.

### Usage

By default, backup router does not learn advertisement interval from master router.

### Examples

The following example shows how to configure a backup router learning advertisement interval from master router.:

```
Switch# configure terminal
Switch(config)# router vrrp 1
Switch(config-router)# learnmaster-mode true
```

## Related Commands

router vrrp

# 13.12.6 preempt-mode

## Command Purpose

To configure the router to take over as master virtual router for a Virtual Router Redundancy Protocol (VRRP) group if it has higher priority than the current master virtual router, use the preempt-mode enable command in router mode. To disable this function, use the preempt-mode disable command.

## Command Syntax

preempt-mode ( true | false )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| True | Preemption enabled | - |
| False | Preemption disabled | - |

## Command Mode

Router Configuration

## Default

Default is true.

## Usage

By default, the router configured preempt-mode true will take over as master virtual router for the group if it has a higher priority than the current master virtual router.

### Examples

The following example shows how to configure the router to preempt the current master virtual router when its priority of 200 is higher than that of the current master virtual router:

```
Switch# configure terminal
Switch(config)# router vrrp 1
Switch(config-router)# preempt-mode true
Switch(config-router)# priority 200
```

### Related Commands

preempt delay

## 13.12.7 preempt delay

### Command Purpose

To configure the master down interval when preempt takes effect.

### Command Syntax

preempt delay time

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| TIME | Preempt delay time | 0-3600 seconds |

### Command Mode

Router Configuration

### Default

Default is 0 second.

### Usage

The original master down interval =(3*advt_interval) + skew_time. when preempt delay time is configured, then master down interval =(3*advt_interval) + skew_time + preempt_delay. By default, preempt delay is 0 second.

## Examples

The following example shows how to configure the router to preempt the current master virtual router when its priority of 200 is higher than that of the current master virtual router, but delay 30 seconds to preempt:

```
Switch# configure terminal
Switch(config)# router vrrp 1
Switch(config-router)# preempt-mode true
Switch(config-router)# priority 200
Switch(config-router)# preempt delay 30
```

## Related Commands

preempt-mode

# 13.12.8 priority (VRRP)

## Command Purpose

To set the priority level of the router within a Virtual Router Redundancy Protocol (VRRP) group, use the priority command in router configuration mode. To remove the priority level of the router, use the no form of this command.

## Command Syntax

priority level

no priority

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| level | Priority of the router within the VRRP group. The range is from 1 to 254. | 1-254 |

## Command Mode

Router Configuration

## Default

Default is 100

## Usage

Use this command to control which router becomes the master virtual router.

## Examples

The following example shows how to configure the router with a priority of 254:

```
Switch# configure terminal
Switch(config)#router vrrp 1
Switch(config-router)#priority 254
```

## Related Commands

router vrrp

# 13.12.9 router vrrp

## Command Purpose

To create a Virtual Router Redundancy Protocol (VRRP) group, use the router vrrp command in Global Configuration mode. To remove this VRRP group, use the no form of this command.

## Command Syntax

router vrrp *GROUP* ( vrf *NAME* | ) ( uniform-mac | )

no router vrrp *GROUP*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| GROUP | Group number to which the tracking applies | 1-255 |
| NAME | VRF name | - |

## Command Mode

Global Configuration

## Default

None

## Usage

None

## Examples

The following is a sample shows how to create a VRRP group:

```
Switch# configure terminal
Switch(config)# router vrrp 1
```

## Related Commands

None

# 13.12.10 router ipv6 vrrp

## Command Purpose

To create an IPv6 Virtual Router Redundancy Protocol (VRRP) group, use the router ipv6 vrrp command in Global Configuration mode. To remove this IPv6 VRRP group, use the no form of this command.

## Command Syntax

router ipv6 vrrp *GROUP* ( vrf *NAME* | )

no router vrrp *GROUP*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| GROUP | Group number to which the tracking applies | 1-255 |
| NAME | VRF name | - |

## Command Mode

Global Configuration

## Default

None

## Usage

None

## Examples

The following is a sample shows how to create an IPv6 VRRP group:

```
Switch# configure terminal
Switch(config)# router ipv6 vrrp 1
```

## Related Commands

None

# 13.12.11 track (VRRP)

## Command Purpose

To configure the Virtual Router Redundancy Protocol (VRRP) to track an object, use the track command in router configuration mode.

To disable the tracking, use the no form of this command.

## Command Syntax

track *OBJ_ID* ( decrement *VALUE* )

no track

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| OBJ_ID | track object id | 1-500 |
| decrement VALUE | Priority decrement value | 1-255 |

## Command Mode

Router Configuration

## Default

None

### Usage

Use track to monitor an up link interface, so that when the monitoring interface is down, backup can change to master router.

Only 1 track object is valid for one special VRRP group, and the later configured track object will always overwrite the previous one.

### Examples

The following is a sample output from the track command:

```
Switch# configure terminal
Switch(config)# track 10 interface eth-0-1 linkstate
Switch(config)# router vrrp 1
Switch(config-router)# track 10
```

### Related Commands

router vrrp

## 13.12.12 enable /disable

### Command Purpose

To enable a VRRP session, use the enable command in router configuration mode.

To disable a VRRP session, use the disable command in router configuration mode.

### Command Syntax

enable

disable

### Command Mode

Router Configuration

### Default

None

## Usage

None

## Examples

The following is a sample shows how to enable a VRRP session:

```
Switch# configure terminal
Switch(config)# router vrrp 1
Switch(config-router)# enable
```

The following is a sample shows how to disable a VRRP session:

```
Switch# configure terminal
Switch(config)# router vrrp 1
Switch(config-router)# disable
```

## Related Commands

None

# 13.12.13 virtual-ip

## Command Purpose

To enable the Virtual Router Redundancy Protocol (VRRP) on an interface and identify the IP address of the virtual router, use the virtual-ip command in router configuration mode. To disable VRRP on the interface and remove the IP address of the virtual router, use the no form of this command.

## Command Syntax

virtual-ip *IP-ADDRESS*

no virtual-ip

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IP-ADDRESS | IP address of the virtual router | IPv4 Address |

## Command Mode

Router Configuration

## Default

None

## Usage

For VRRP to elect a designated router, at least one router on the cable must have been configured with the primary address of the virtual router.

VRRP does not support address learning. All addresses must be configured.

All routers in the VRRP group must be configured with the same primary address for the virtual router. If different primary addresses are configured, the routers in the VRRP group will not communicate with each other and any mis-configured routers in the group will change their state to master.

The virtual IP address must be in the same subnet with VRRP interface, and if virtual IP is equal to the interface IP address, it is called IP address owner.

## Examples

The following example shows how to enable VRRP on eth-0-1. The VRRP group is 1. IP address 10.0.1.20 is the address of the virtual router:

```
Switch# configure terminal
Switch(config)#interface eth-0-1
Switch(config-if)#no switchport
Switch(config-if)#ip address 10.0.1.1/24
Switch(config)#router vrrp 1
Switch(config-router)#interface eth-0-1
Switch(config-router)#virtual-ip 10.0.1.20
Switch(config-router)#enable
```

## Related Commands

router vrrp

# 13.12.14 virtual-ipv6

## Command Purpose

To configure an identify the IPv6 address of the virtual router, use the virtual-ipv6 command in router configuration mode. To remove the IPv6 address of the virtual router, use the no form of this command.

## Command Syntax

virtual-ip *IPv6-ADDRESS* ( link-local | )

no virtual-ip *IPv6-ADDRESS* ( link-local | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IPv6-ADDRESS | IPv6 address of the virtual router | IPv6 Address |

## Command Mode

Router Configuration

## Default

None

## Usage

All routers in the VRRP group must be configured with the same virtual ipv6 address for the virtual router.

The virtual IPv6 address must be in the same subnet with VRRP interface, and if virtual IPv6 address is equal to the interface IPv6 address, it is called IP address owner, and priority will be set to 255. Link-local virtual IPv6 address must configure before global unicast virtual IPv6 address.

## Examples

The following example shows how to configure virtual IPv6 address :

```
Switch# configure terminal
Switch(config)#interface eth-0-1
Switch(config-if)#no switchport
Switch(config-if)#ipv6 address 2000::1/64
Switch(config)#router ipv6 vrrp 1
Switch(config-router)#interface eth-0-1
Switch(config-router)#virtual-ipv6 fe80::1 link-local
Switch(config-router)#virtual-ipv6 2000::1
Switch(config-router)#enable
```

### Related Commands

router ipv6 vrrp

## 13.12.15 vrrp version

### Command Purpose

To set the Virtual Router Redundancy Protocol (VRRP) version, use the vrrp version command in Global Configuration mode. To set VRRP version to default, use the no form of this command.

### Command Syntax

vrrp version ( 2 | 3 )

no vrrp version

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| 2 | VRRP version 2 | - |
| 3 | VRRP version 3 | - |

### Command Mode

Global Configuration

### Default

VRRP version 2

### Usage

None

## Examples

The following example shows how to set VRRP version to 3.:

```
Switch# configure terminal
Switch(config)# vrrp version 3
```

## Related Commands

router vrrp

# 13.12.16 show vrrp

## Command Purpose

To display a brief or detailed status of one or all configured Virtual Router Redundancy Protocol (VRRP) groups on the router, use the show vrrp command in Privileged EXEC mode.

## Command Syntax

show vrrp ( *GROUP* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| GROUP | (Optional) Virtual router group number of the group for which information is to be displayed. | 1-255 |

## Command Mode

Privileged EXEC

## Default

None

## Usage

If no group is specified, all groups are displayed.

## Examples

The following is a sample output from the show vrrp command:

```
Switch# show vrrp
VRID <1>
 State                : Master
 Virtual IP           : 10.0.20.254(Not IP owner)
 Interface            : eth-0-10
 VMAC                 : 0000.5e00.0101
 Advt timer           : 1
 Preempt mode         : TRUE
 Conf pri             : 200            Run pri    : 200
 Master router ip    : 10.0.20.1
 Master priority     : 200
 Master advt timer   : 1
 Master down timer   : 3
Preempt delay        : 100 second(s)
     Learn master mode    : FALSE
```

## Related Commands

router vrrp

# 13.12.17 show ipv6 vrrp

## Command Purpose

To display a brief or detailed status of one or all configured IPv6 Virtual Router Redundancy Protocol (VRRP) groups on the router, use the show ipv6 vrrp command in Privileged EXEC mode.

## Command Syntax

show ipv6 vrrp ( *GROUP* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| GROUP | (Optional) IPv6 Virtual router group number of the group for which information is to be displayed. | 1-255 |

## Command Mode

Privileged EXEC

### Default

None

### Usage

If no group is specified, all groups are displayed.

### Examples

The following is a sample output from the show ipv6 vrrp command:

```
Switch# show ipv6 vrrp
IPv6 vrrp session count: 1
VRID <1>
 State               : Master
 Virtual IP          : fe80::1(Not IP owner)
                       2000::2(Not IP owner)
 Interface           : eth-0-9
 VMAC                : 0000.5e00.0201
 VRF                 : Default
 Advt timer          : 1 second(s)
 Preempt mode        : TRUE
 Conf pri            : Unset          Run pri    : 100
 Track Object        : 1              Decre pri  : 20
 Master router ip    : fe80::48cc:69ff:fec8:5b00
 Master priority     : 100
 Master advt timer   : 100 centi-second(s)
 Master down timer   : 4 second(s)
 Preempt delay       : 0 second(s)
```

### Related Commands

router ipv6 vrrp

## 13.13 Track Commands

### 13.13.1 delay up

### Command Purpose

Use this command to specify the delay time before communication state of track object changes to up.

Use the no form of this command to restore the default value.

## Command Syntax

delay up *SECONDS*

no delay up

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SECONDS | The delay time before the status of track turn up. | 1-180 seconds |

## Command Mode

Track Configuration

## Default

By default the delay time is 0.

## Usage

None

## Examples

In the following example, the delay up command is used to configure delay when object state is turned from down to up:

```
Switch# configure terminal
Switch(config)# track 1 interface eth-0-1 linkstate
Switch(config-track)# delay up 30
```

## Related Commands

delay down

# 13.13.2 delay down

## Command Purpose

Use this command to specify the delay time before communication state of track object changes to down.

Use the no form of this command to restore the default value.

## Command Syntax

delay down *SECONDS*

no delay down

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SECONDS | The delay time before the status of track turn down. | 1-180 seconds |

## Command Mode

Track Configuration

## Default

By default the delay time is 0.

## Usage

None

## Examples

In the following example, the delay down command is used to configure delay when object state is turned from up to down:

```
Switch# configure terminal
Switch(config)# track 1 interface eth-0-1 linkstate
Switch(config-track)# delay down 30
```

## Related Commands

delay up

# 13.13.3 frequency

## Command Purpose

Use this command to set the frequency of IP SLA operation.

Use the no form of this command to restore the default value.

## Command Syntax

frequency *SECONDS*

no frequency

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SECONDS | The frequency of IP SLA operation | 1-4800 seconds |

## Command Mode

IP SLA Configuration

## Default

The default value is 60 seconds.

## Usage

The frequency value should follow this rule:

frequency > interval * ( packets-per-test - 1 ) + timeout

## Examples

In the following example, the frequency command is used to set the rate at which a specified IP SLAs operation repeats:

```
Switch# configure terminal
Switch(config)# ip sla monitor 1
Switch(config-ipsla)# frequency 10
```

## Related Commands

show ip sla monitor

## 13.13.4 ip sla monitor

### Command Purpose

To create an IP SLA entry and enter IP SLA monitor configuration mode, use ip sla monitor in CONFIG mode.

To delete an IP SLA entry, use the no form of this command.

### Command Syntax

ip sla monitor *ENTRY-NUMBER*

no ip sla monitor *ENTRY-NUMBER*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ENTRY-NUMBER | Identify of ip sla monitor entry | 1-255 |

### Command Mode

Global Configuration

### Default

None

### Usage

None

### Examples

In the following example, the ip sla monitor command is used to create an ip sla monitor entry:

```
Switch# configure terminal
Switch(config)# ip sla monitor 1
Switch(config-ipsla)#
```

### Related Commands

show ip sla monitor

## 13.13.5 description string

### Command Purpose

To describe the ipsla entry with a string.

Use the no form of this command to delete it.

### Command Syntax

description *STRING*

no description

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| STRING | description string for IP SLA | String with up to 255 characters |

### Command Mode

IP SLA Configuration

### Default

None

### Usage

None

### Examples

In the following example shows how to set IP SLA description:

```
Switch# configure terminal
Switch(config)# ip sla monitor 1
Switch(config-ipsla)#description thisisanexampler
```

### Related Commands

None

## 13.13.6 ip sla monitor schedule

### Command Purpose

To enable an IP SLA entry, use ip sla monitor schedule command in CONFIG mode.

To disable an IP SLA entry, use the no form of this command.

### Command Syntax

ip sla monitor schedule ( *ENTRY-NUMBER* )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ENTRY-NUMBER | Identify of ip sla monitor entry | 1-255 |

### Command Mode

Global Configuration

### Default

None

### Usage

None

### Examples

In the following example, the ip sla monitor schedule command is used to enable an IP SLA monitor entry:

```
Switch# configure terminal
Switch(config)# ip sla monitor 1
Switch(config-ipsla)# exit
Switch(config)# ip sla monitor schedule 1
```

### Related Commands

show ip sla monitor

## 13.13.7 timeout

### Command Purpose

Use this command to set the time value which IP SLA operation wait for the response.

Use the no form of this command to restore the default value.

### Command Syntax

timeout *SECONDS*

no timeout

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SECONDS | Time out value | 1-4800 seconds |

### Command Mode

IP SLA Configuration

### Default

The default value is 5 seconds.

### Usage

The timeout value should follow this rule:

frequency > interval * ( packets-per-test - 1 ) + timeout)

### Examples

In the following example, the timeout command is used to set the time range:

```
Switch# configure terminal
Switch(config)# ip sla monitor 1
Switch(config-ipsla)# timeout 10
```

### Related Commands

show ip sla monitor

## 13.13.8 threshold

### Command Purpose

Use this command to set the upper threshold value for calculating network monitoring statistics created by an IP SLAs operation.

Use the no form of this command to restore the default value.

### Command Syntax

threshold *MILLISECONDS*

no threshold

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MILLISECONDS | The upper threshold value for calculating network monitoring statistics created by an IP SLAs operation | 1 - 4800000 milliseconds |

### Command Mode

IP SLA Configuration

### Default

The default value is 5000 milliseconds.

### Usage

None

## Examples

In the following example, the threshold command is used to set the threshold time range:

```
Switch# configure terminal
Switch(config)# ip sla monitor 1
Switch(config-ipsla)# threshold 10000
```

## Related Commands

show ip sla monitor

# 13.13.9 interval

## Command Purpose

Use this command to set the interval between probe of each ipsla test.

Use the no form of this command to restore the default value

## Command Syntax

interval *SECONDS*

no interval

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SECONDS | The interval between probe of each ipsla test | 1-4800 seconds |

## Command Mode

IP SLA Configuration

## Default

The default value is 6 seconds.

## Usage

The interval value should follow this rule:

( frequency > interval * ( packets-per-test - 1 ) + timeout)

## Examples

In the following example， the interval command is used to set the IP SLA interval:

```
Switch# configure terminal
Switch(config)# ip sla monitor 1
Switch(config-ipsla)# interval 10
```

## Related Commands

show ip sla monitor

# 13.13.10 ttl

## Command Purpose

Use this command to set the ttl of icmp request send by ipsla test.

Use the no form of this command to restore the default value.

## Command Syntax

ttl *VALUE*

no ttl

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VALUE | TTL value | 1-255 |

## Command Mode

IP SLA Configuration

## Default

64

## Usage

None

## Examples

The following example shows how to set TTL for IP SLA:

```
Switch# configure terminal
Switch(config)# ip sla monitor 1
Switch(config-ipsla)# ttl 100
```

## Related Commands

show ip sla monitor

# 13.13.11 tos

## Command Purpose

Use this command to set the tos of icmp request send by ipsla test.

Use the no form of this command to restore the default value.

## Command Syntax

tos *VALUE*

no tos

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VALUE | tos value | 0-255 |

## Command Mode

IP SLA Configuration

## Default

0

## Usage

None

## Examples

The following example shows how to set tos for IP SLA:

```
Switch# configure terminal
Switch(config)# ip sla monitor 1
Switch(config-ipsla)# tos 100
```

## Related Commands

show ip sla monitor

# 13.13.12 data-size

## Command Purpose

Use this command to set the protocol data size in the payload of an IP SLAs operation's request packet.

Use the no form of this command to restore the default value.

## Command Syntax

data-size *SIZE*

no data-size

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SIZE | The protocol data size in the payload of an IP SLAs operation's request packet | 0-8100 |

## Command Mode

IP SLA Configuration

## Default

28

## Usage

None

## Examples

```
Switch# configure terminal
Switch(config)# ip sla monitor 1
Switch(config-ipsla)# data-size 100
```

## Related Commands

show ip sla monitor

# 13.13.13 data-pattern

## Command Purpose

Use this command to set the hexadecimal value for data pattern.

Use the no form of this command to restore the default value.

## Command Syntax

data-pattern *HEX_STRING*

no data-pattern

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| HEX_STRING | Hex string for data patten | 0-0xFFFFFFFF |

## Command Mode

IP SLA Configuration

## Default

ABCDABCD

## Usage

None

### Examples

```
Switch# configure terminal
Switch(config)# ip sla monitor 1
Switch(config-ipsla)# data-pattern abababab
```

### Related Commands

show ip sla monitor

## 13.13.14 fail-percent

### Command Purpose

Use this command to set the fail percent used to judge test result.

Use the no form of this command to restore the default value.

### Command Syntax

fail-percent *PERCENT*

no fail-percent

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PERCENT | The fail percent used to judge test result | 1-100 |

### Command Mode

IP SLA Configuration

### Default

100

### Usage

None

## Examples

```
Switch# configure terminal
Switch(config)# ip sla monitor 1
Switch(config-ipsla)# fail-percent 100
```

## Related Commands

show ip sla monitor

# 13.13.15 packets-per-test

## Command Purpose

Use this command to set the probe count of each test.

Use the no form of this command to restore the default value.

## Command Syntax

packets-per-test *NUMBER*

no packets-per-test

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NUMBER | The probe count of each test | 1-10 |

## Command Mode

IP SLA Configuration

## Default

3

## Usage

The packets-per-test value should follow this rule:

( frequency > interval * ( packets-per-test - 1 ) + timeout)

### Examples

```
Switch# configure terminal
Switch(config)# ip sla monitor 1
Switch(config-ipsla)# packets-per-test 5
```

### Related Commands

show ip sla monitor

## 13.13.16 statistics (packet | test)

### Command Purpose

Use this command to set the statistics number of packet and recent test.

Use the no form of this command to restore the default value.

### Command Syntax

statistics ( packet *PKT_CNT* | test *TEST_CNT* )

no statistics packet

no statistics test

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PKT_CNT | Packet Number for statistic | 0-1000 |
| TEST_CNT | The count of test for statistic | 1-10 |

### Command Mode

IP SLA Configuration

### Default

packet: 50; test: 5

### Usage

None

## Examples

```
Switch# configure terminal
Switch(config)# ip sla monitor 1
Switch(config-ipsla)# statistics packet 60
Switch(config-ipsla)# statistics test 6
```

## Related Commands

show ip sla monitor

# 13.13.17 clear ip sla statistics

## Command Purpose

Use this command to clear ipsla statistics.

## Command Syntax

clear ip sla statistics *ENTRY_ID*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ENTRY_ID | IP SLA entry id | 1-255 |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

```
Switch# clear ip sla statistics 1
```

## Related Commands

show ip sla monitor

# 13.13.18 track

## Command Purpose

To configure a track object, use the track command in Global Configuration mode.

## Command Syntax

track *OBJECT_ID*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| OBJECT_ID | Object identity is used to identify track object | 1-500 |

## Command Mode

Global Configuration

## Default

None

## Usage

None

## Examples

In the following example, the track command is used to create a track object:

```
Switch# configure terminal
Switch(config)# track 1 interface eth-0-1 linkstate
Switch(config-track)#
```

## Related Commands

show track

# 13.13.19 track interface linkstate

## Command Purpose

Use this command to create a track object and track the state of an interface

## Command Syntax

track *OBJECT_ID* interface *IFNAME* linkstate

no track *OBJECT_ID*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| OBJECT_ID | Object identity is used to identify track object | 1-500 |
| IFNAME | Interface name | Support physical/aggregation/loopback/vlan/tunnel ports |

## Command Mode

Global Configuration

## Default

None

## Usage

None

## Examples

In the following example, the track interface linkstate command is used to create an track object:

```
Switch# configure terminal
Switch(config)# track 1 interface eth-0-1 linkstate
Switch(config-track)#
```

## Related Commands

show track

# 13.13.20 track rtr reachability

## Command Purpose

Create a track object and track the state of an ip sla entry, use the track rtr reachability to command in Global Configuration mode. To remove a track, use the no form of this command.

When the state of IP SLA entry is OK or over-threshold, track object state is up; otherwise track object state is down.

## Command Syntax

track *OBJECT_ID* rtr *ENTRY_ID* reachability

no track *OBJECT_ID*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| OBJECT_ID | Object identity is used to identify track object | 1-500 |
| ENTRY_ID | IP SLA entry id | 1-255 |

## Command Mode

Global Configuration

## Default

None

## Usage

None

## Examples

In the following example, the track rtr reachability command is used to create a track object:

```
Switch# configure terminal
Switch(config)# ip sla monitor 1
Switch(config-ipsla)# exit
Switch(config)# track 1 rtr 1 reachability
Switch(config-track)#
```

## Related Commands

show track

# 13.13.21 track rtr state

## Command Purpose

Create a track object and track the state of an IP SLA entry, use the track rtr state command in Global Configuration mode. To remove a track, use the no form of this command.

When the state of IP SLA entry is OK, track object state is up; otherwise track object state is down.

## Command Syntax

track *OBJECT_ID* rtr *ENTRY_ID* state

no track *OBJECT_ID*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| OBJECT_ID | Object identity is used to identify track object | 1-500 |
| ENTRY_ID | IP SLA entry id | 1-255 |

## Command Mode

Global Configuration

## Default

None

## Usage

None

## Examples

In the following example, the track rtr state command is used to create a track object:

```
Switch# configure terminal
Switch(config)# ip sla monitor 1
Switch(config-ipsla)# exit
Switch(config)# track 1 rtr 1 state
Switch(config-track)#
```

## Related Commands

show track

# 13.13.22 track bfd

## Command Purpose

Create a track object and track the state of bfd session, use the track bfd command in Global Configuration mode. To remove a track, use the no form of this command.

When the state of bfd session is up, track object state is up; otherwise track object state is down.

## Command Syntax

track *OBJECT_ID* bfd source interface *IFNAME* destination *IP_ADDR*

no track *OBJECT_ID*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| OBJECT_ID | Object identity is used to identify track object | 1-500 |

| | | |
|---|---|---|
| IFNAME | Interface name | Support physical/aggregation/vlan / ports |
| IP_ADDR | Destination IP address of the bfd session | IPv4 Address |

## Command Mode

Global Configuration

## Default

None

## Usage

The source interface should be a Layer 3 interface and ip address should be configured.

The destination ip address should be in the same network of the interface ip address.

## Examples

In the following example, the track bfd command is used to create a track object:

```
Switch# configure terminal
Switch(config)# interface eth-0-9
Switch(config-if)# no switchport
Switch(config-if)# no shutdown
Switch(config-if)# ip address 9.9.9.1/24
Switch(config-if)# quit
Switch(config)# track 1 bfd source interface eth-0-9 destination 9.9.9.2
Switch(config-track)#
```

## Related Commands

show track

# 13.13.23 track bfd session

## Command Purpose

Create a track object and track the state of bfd session, use the track bfd session command in Global Configuration mode. To remove a track, use the no form of this command.

When the state of bfd session is up, track object state is up; otherwise track object state is down.

## Command Syntax

track *OBJECT_ID* bfd session *SESSION_NAME*

no track *OBJECT_ID*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| OBJECT_ID | Object identity is used to identify track object | 1-500 |
| SESSION_NAME | BFD session name | String with up to 16 characters |

## Command Mode

Global Configuration

## Default

None

## Usage

The bfd session should be created before this command configure.

## Examples

In the following example, the track bfd session command is used to create a track object:

```
Switch# configure terminal
Switch(config)# bfd test peer-ip 9.9.9.2 source 10.10.10.1 local 10 remote 20
```

```
Switch(config)# track 1 bfd session test
Switch(config-track)#
```

### Related Commands

show track

## 13.13.24 track cfm

### Command Purpose

Create a track object and track the state of cfm, use the track cfm command in Global Configuration mode. To remove a track, use the no form of this command.

When the state of cfm is up, track object state is up; otherwise track object state is down.

### Command Syntax

track *OBJECT_ID* cfm domain *DOMAIN_NAME* service *CSI_ID* ( rmepid *MEPID* | ) ( rdi-trigger | )

no track *OBJECT_ID*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| OBJECT_ID | Object identity is used to identify track object | 1-500 |
| DOMAIN_NAME | Maintenance domain name | String with up to 43 characters |
| CSI_ID | Maintenance association name | The first character should be a-z or A-Z, character only can be 0-9A-Za-z.-_ and the max len is 43. MD(Maintenance domain) name and MA(Maintenance association) name totally up to 44 characters. |
| MEPID | Remote mep id | 1-8191 |

### Command Mode

Global Configuration

## Default

None

## Usage

None

## Examples

In the following example, the track cfm command is used to create a track object:

```
Switch# configure terminal
Switch(config)# track 1 cfm domain tst service tst
```

## Related Commands

show track

# 13.13.25 type icmp-echo

## Command Purpose

Use this command to defines an Echo operation with ICMP packet and enters destination IP address。

Use the no form of this command to delete an Echo operation and destination IP address.

## Command Syntax

type icmp-echo *IP_ADDR* ( source-interface *IFNAME* | ) ( source-ip *SRC_IP_ADDR* | )

no type icmp-echo

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IP_ADDR | Destionation IP address of sending icmp packet | IPv4 Address |
| source-interface IFNAME | Source interface of sending icmp packet | Support physical/aggregation/vlan / ports |
| SRC_IP_ADDR | Source IP address of sending icmp packet | IPv4 Address |

## Command Mode

IP SLA Configuration

## Default

None

## Usage

If the interface specified by source-interface is not one of the out interfaces by routing, packets may not be sent out.

## Examples

In the following example, the type echo protocol ipIcmpEcho command is used to set ICMP packet and destination IP address:

```
Switch# configure terminal
Switch(config)# ip sla monitor 1
Switch(config-ipsla)# type icmp-echo 192.168.0.1
```

## Related Commands

show ip sla monitor

# 13.13.26 show ip sla monitor

## Command Purpose

To show IP SLA entries, packet statistics and recent test result, use show ip sla monitor in EXEC mode.

## Command Syntax

show ip sla monitor ( *ENTRY_ID* ) ( statistics ( packet | test ) | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ENTRY_ID | Entry number is used to identify ip sla monitor entry, its range is from 1 to 255 | 1-255 |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

In the following example, the show ip sla monitor command is used to show ip sla monitor entries:

```
Switch# show ip sla monitor
Entry 1
    Type                    :  Echo
    Admin state             :  Enable
    Destination address     :  192.168.0.1
    Frequency               :  3 seconds
    Timeout                 :  2 seconds
    Threshold               :  1 seconds
Running Frequency           :  3 seconds
Vrf                         :  vpn1
    Return code             :  OK
```

## Related Commands

ip sla monitor

# 13.13.27 show track

## Command Purpose

To show TRACK entries, use show track in EXEC mode.

## Command Syntax

show track *OBJECT_ID*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| OBJECT_ID | Object identity is used to identify track object | 1-500 |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

In the following example, the show track command is used to show track entries:

```
Switch# show track
Track 2
    Type                : Response Time Reporter(RTR) Reachability
    Interface           : eth-0-2
    State               : down
    Delay up            : 30 seconds
    Delay down          : 30 seconds
```

## Related Commands

track

# 13.13.28 vrf

## Command Purpose

To use IP SLA operations in VPNs, use vrf in ipsla mode. To remove VPN feathers from IP SLA operations, use the no form of this command.

## Command Syntax

vrf *NAME*

no vrf

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | VRF name | String with up to 31 characters |

### Command Mode

IP SLA Configuration

### Default

None

### Usage

None

### Examples

In the following example, the vrf command is used to use ip sla monitor entry in VPN:

```
Switch# configure terminal
Switch(config)# ip sla monitor 1
Switch(config-ipsla)# vrf vpn1
```

### Related Commands

show ip sla monitor

## 13.14 VARP Commands

### 13.14.1 ip virtual-router mac

### Command Purpose

Use this command to configure a virtual mac for switch.

Use the no form of this command to remove the virtual-router mac.

## Command Syntax

ip virtual-router mac mac-addr

no ip virtual-router mac

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| mac-addr | Virtual mac address | MAC Address |

## Command Mode

Global Configuration

## Default

None

## Usage

This virtual mac is used for interface configured virtual IP address. The address is receive-only; the switch never sends packets with this address as the source. And it only exists in ARP replay for virtual IP.

## Examples

The following example is the result of this command:

```
Switch# configure terminal
Switch(config)# ip virtual-router mac 1.1.1
```

## Related Commands

ip virtual-router address

# 13.14.2 ip virtual-router address

## Command Purpose

Use this command to configure a virtual IP address for interface.

Use the no form of this command to remove the virtual-router IP.

## Command Syntax

ip virtual-router address ( *A.B.C.D* | *A.B.C.D/M* )

no ip virtual-router address

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| A.B.C.D | Virtual IP address without mask | IPv4 Address |
| A.B.C.D/M | Virtual IP address with mask | IPv4 Address and mask length |

## Command Mode

Interface Configuration

## Default

None

## Usage

The ip virtual-router address command assigns a virtual IP address to the interface . The virtual IP address without mask should be in the subnet of the primary IP address assigned to the interface and the virtual IP address with mask should not be in the subnet of the primary IP address assigned to the interface. The virtual IP address without mask and the virtual IP address with mask must be selected only one to be configured. if virtual mac is not configured, there is no reply to ARP request packet for the virtual IP address.

## Examples

The following example is the result of this command:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ip virtual-router address 1.1.1.1
```

## Related Commands

ip virtual-router mac

# 13.15 IP BFD Commands

## 13.15.1 bfd interval

### Command Purpose

Use this command to specify the desired transmit interval, receive interval and detect multiplier of IP BFD on the interface.

Use the “no” form of this command to restore the default value.

### Command Syntax

bfd interval { tx *MINTX* | rx *MINRX* | multiplier *MULTIPLIER* }

no bfd interval

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MINTX | Set BFD minimum trasmit interval | 3-1000 millisecond |
| MINRX | Set BFD minimum receive interval | 3-1000 millisecond |
| MULTIPLIER | Set the value of Hello Multiplier | 2-15 |

### Command Mode

Interface Configuration

### Default

The default value for minimum tx interval and rx interval is 20ms.

The default value for detect multiple is 3.

### Usage

Use this command to specify the transmit interval, receive interval and detect multiple of IP BFD on the interface.

This configuration should affect all the IP BFD sessions on this interface. The actual transmit interval and receive interval need to negotiate with another end of the session.

### Examples

In the following example, the desired transmit interval is set as 3 ms, the desired receive interval is set as 3 ms, the detect multiplier is set as 3 times:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# bfd interval mintx 3 minrx 3 multiplier 3
```

### Related Commands

None

## 13.15.2 bfd NAME peer-ip A.B.C.D interface

### Command Purpose

Use this command to configure one Single-hop IP BFD session.

Use the “no” form of this command to remove the session

### Command Syntax

bfd *NAME* peer-ip *A.B.C.D* ( vrf *NAME* | ) interface ( *IFPHYSICAL* | *IFVLAN* | *IFAGG* ) ( source-ip *A.B.C.D* | ) ( auto | local *LDISR* remote *RDISR* )

no bfd *NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| peer-ip A.B.C.D | BFD destination ip address | IPv4 Address |
| vrf NAME | specify a vrf for bfd | - |
| interface | specify an interface for single hop bfd | - |
| Source-ip A.B.C.D | specify source ip address | IPv4 Address |
| auto | Allocating local discriminator by system | - |
| LDISR | specify local discriminator by users | 257-8191 |

| | | |
|---|---|---|
| RDISR | specify local discriminator by users | 1-4294967295 |

## Command Mode

Global Configuration

## Default

By default there is no IP Single BFD session to be created.

## Usage

Use this command to specify the IP BFD for static route. BFD session is created, the bfd configurations need meet the following conditions:

- The destination ip address should be subnet with the ip address of the binded interface.
- The specified vrf should be same as that of the binded interface. If users don't specify the vrf, the bfd vrf would be default.
- The source ip address should be same as that of the binded interface. If users don't specify the source ip address, the source ip would be got from the binded interface, which is subnet with the destination ip address. If there are many ip addresses of the binded interface subnet the the destination ip address, the primary ip address would be selected firstly, and the smaller values of the ip adderss would be chosen secondly.

If users specify the local and remote discriminator, bfd uses them. Otherwise, the bfd local discriminator would be allocated by system.

## Examples

In the following example, the single-hop IP bfd session "test" is created:

```
Switch# configure terminal
Switch(config)# bfd test peer-ip 9.9.9.2 interface eth-0-9 local 10 remote 20
```

## Related Commands

ip route

## 13.15.3 bfd NAME peer-ip A.B.C.D source-ip

### Command Purpose

Use this command to configure one Multi-hop IP BFD session.

Use the “no” form of this command to remove this configuration.

### Command Syntax

bfd *NAME* peer-ip *A.B.C.D* source-ip *A.B.C.D* ( auto | local *LDISR* remote *RDISR* )

no bfd *NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | BFD name | String with up to 16 characters |
| peer-ip A.B.C.D | BFD destination ip address | IPv4 Address |
| Source-ip A.B.C.D | specify source ip address | IPv4 Address |
| auto | Allocating local discriminator by system | - |
| LDISR | specify local discriminator by users | 257-8191 |
| RDISR | specify local discriminator by users | 1-4294967295 |

### Command Mode

Global Configuration

### Default

By default there is no IP Multiple BFD session to be created.

### Usage

Use this command to specify the IP BFD for static route. BFD session is created, the bfd configurations need meet the following conditions:

1.The source ip address should be same as that of the local L3 interface.

If users specify the local and remote discriminator, bfd uses them. Otherwise, the bfd local discriminator would be allocated by system.

## Examples

In the following example, the multi-hop IP bfd session "test" is created:

```
Switch# configure terminal
Switch(config)# bfd test peer-ip 9.9.9.2 source 10.10.10.1 local 10 remote 20
```

## Related Commands

ip route

# 13.15.4 bfd set interval

## Command Purpose

Use this command to configure the interval of sending and receiving bfd packets for bfd session.

Use the "no" form of this command to remove this configuration.

## Command Syntax

bfd set interval mintx *MINTX* minrx *MINRX* multiplier *MULTIPLIER*

no bfd set interval

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MINTX | The minimum interval of sending bfd packets | 3-1000 millisecond |
| MINRX | The minimum interval of receiving bfd packets | 3-1000 millisecond |
| MULTIPLIER | the times of timeout | 2-15 |

## Command Mode

BFD Configuration

## Default

By default, the minimum time of sending and receiving packets are respectively 20ms and 20ms, the times of timeout is 3.

## Usage

Use this command to specify the mintx, minrx and timeout of bfd session.

## Examples

In the following example, set the interval of sending and receiving bfd packets for bfd session “test”:

```
Switch# configure terminal
Switch(config)# bfd test
Switch(config-ip-bfd)bfd set interval mintx 30 minrx 30 multiplier 5
```

## Related Commands

show bfd session detail

# 13.15.5 bfd global dscp

## Command Purpose

Use this command to configure global dscp value for all multi-hop bfd sessions.

Use the “no” form of this command to remove this configuration.

## Command Syntax

bfd set dscp *DSCP*

no bfd global dscp

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DSCP | the dscp value of bfd packet in IP head | 0-63 |

## Command Mode

Global Configuration

## Default

By default, the dscp value of all the multi-hop bfd sessions is 56.

## Usage

Use this command to specify the dscp for all the multi-hop bfd sessions.

## Examples

In the following example, user configures to set the global dscp value for all the multi-hop for all the bfd sessions:

```
Switch# configure terminal
Switch(config)# bfd global dscp 63
```

## Related Commands

show bfd session detail

# 13.15.6 bfd set dscp

## Command Purpose

Use this command to configure global dscp value for one multi-hop bfd session.

Use the “no” form of this command to remove this configuration.

## Command Syntax

bfd set dscp *DSCP*

no bfd set dscp

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DSCP | the dscp value of bfd packet in IP head | 0-63 |

## Command Mode

BFD Configuration

### Default

By default, the dscp value of one multi-hop bfd sessions is 56.

### Usage

Use this command to specify the dscp for one multi-hop bfd session.

When removing this configuration, the dscp of this multiplier bfd session would be the global dscp value when configuring the global dscp.

### Examples

In the following example, user configures to set the global dscp value for all the multi-hop for all the bfd sessions:

```
Switch# configure terminal
Switch(config)bfd test
Switch(config-ip-bfd)# bfd set dscp 63
```

### Related Commands

show bfd session detail

## 13.15.7 show bfd

### Command Purpose

Use this command to show the statues of IP BFD module.

### Command Syntax

show bfd

### Command Mode

Privileged EXEC

### Default

None

### Usage

Use this command to show the statues of IP BFD module.

### Examples

The following example is the result of this command:

```
Switch# show bfd
BFD ID: 00      Start Time:Thu May  2 03:09:41 2013
Number of Sessions:    2
Slow Timer: 1000        Image type: DISTRIBUTED
Echo Mode: Disabled     BFD Notifications disabled
Next Session Discriminator:   10
BFD Clients:
STATIC -> Client ID: 1
OSPF-> Client ID: 4
```

### Related Commands

None

## 13.15.8 show bfd static configurations

### Command Purpose

Use this command to show the bfd static configurations.

### Command Syntax

show bfd static configurations ( word | )

### Command Mode

Privileged EXEC

### Default

None

### Usage

Use this command to show the bfd static configurations.

## Examples

The following example is the result of this command:

```
Switch# show bfd static configurations
------------------------------------------------------------------------------------
-------------------------------------------
Name              Type       VRF             LocalDiscr   RemoteDiscr  Src Ip
Dst Ip           interface        Status
test1             single-hop default          -            -            10.10.10.1
10.10.10.2       vlan10           active
test2             single-hop test             -            -            9.9.9.1
9.9.9.2          vlan4094         active
test3             single-hop default          8191         4294967295   10.10.10.1
10.10.10.3       vlan10           active
```

## Related Commands

None

# 13.15.9 show bfd session

## Command Purpose

Use this command to show the bfd sessions.

## Command Syntax

show bfd session ( detail | )

show bfd session *SRC DST* interface *IFNAME* ( detail | )

show bfd session *SRC DST* ( detail | )

show bfd session discriminator *SESS* ( detail | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| detail | Show session details | - |
| SRC | Local IPv4 address | IPv4 Address |
| DST | Neighbor IPv4 address | IPv4 Address |
| IFNAME | BFD Interface | Support physical/aggregation/vlan / ports |
| discriminator SESS | BFD session index | 1-4294967295 |

## Command Mode

Privileged EXEC

## Default

None

## Usage

Use this command to show the bfd session.

Use the key word “detail” to show the detailed information.

To filter the show result, user can specify the session’s source and destination address and interface.

## Examples

The following example is the result of this command: :

```
DUT1# show bfd session
Abbreviation:
LD: Local Discriminator.  RD: Remote Discriminator
S: Single hop session.    M: Multi hop session.
SD: Static Discriminator.  DD: Dynamic Discriminator
A: Admin down.    D:Down.    I:Init.    U:Up.
================================================================================
LD          RD          TYPE ST   UP-Time    Remote-Addr     VRF
8191        4294967295  S-SD D    00:00:00   10.10.10.3      default
8192        0           S-DD D    00:00:00   11.11.11.2      youshi
8193        0           S-DD D    00:00:00   10.10.10.2      default
8194        0           S-DD D    00:00:00   9.9.9.2         test
Number of Sessions:    4
DUT1# show bfd session detail
=====================================================
Session Interface : vlan10               Session Name : test3
Lower Layer : IPv4                       Version : 1
Session Type : Single Hop                Session State : Down
Discriminator Type : Static              DSCP : 0
Local Discriminator : 8191               Local Address : 10.10.10.1
Remote Discriminator: 4294967295         Remote Address: 10.10.10.3
Local Port : 49155                       Remote Port : 3784
vrf : default
Diagnostics : None
Timers in Milliseconds :
Min Tx: 20               Min Rx: 20               Multiplier: 3
Neg Tx: 4                Neg Rx: 20               Neg detect mult: 3
Sess up time : 00:00:00
```

```
Sess down time : 00:00:00
Bind Application : -
------------------------------------------------------------
Session Interface : vlan11              Session Name : -
Lower Layer : IPv4                      Version : 1
Session Type : Single Hop               Session State : Down
Discriminator Type : Dynamic            DSCP : 0
Local Discriminator : 8192              Local Address : 11.11.11.1
Remote Discriminator: 0                 Remote Address: 11.11.11.2
Local Port : 49152                      Remote Port : 3784
vrf : youwhile
Diagnostics : None
Timers in Milliseconds :
Min Tx: 20              Min Rx: 20              Multiplier: 3
Neg Tx: 4               Neg Rx: 20              Neg detect mult: 3
Sess up time : 00:00:00
Sess down time : 00:00:00
Bind Application : VRRP
------------------------------------------------------------
```

### Related Commands

None

## 13.15.10 show resource bfd static configurations

### Command Purpose

Use this command to show the resource of static bfd configurations

### Command Syntax

show resource bfd static configurations

### Command Mode

User EXEC

### Default

None

### Usage

Use this command to show the resource of static BFD configurations

## Examples

The following example is the result of this command:

```
Switch# show resource bfd static configurations
Switch# show resource bfd static configurations

BFD (Static-BFD, Vrrp-BFD)
Resource                          Used          Capability
============================================================
BFD static configuration
```

## Related Commands

None

# 13.15.11 show bfd interface

## Command Purpose

Use this command to show the IP bfd interface statues.

## Command Syntax

show bfd interface ( *IFNAME* | all | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | BFD Interface | Support physical/aggregation/vlan / ports |

## Command Mode

Privileged EXEC

## Default

None

## Usage

Use this command to show the IP bfd interface statues.

User can show the specified interface or all interfaces.

## Examples

The following example is the result of this command:

```
Switch# show bfd interface eth-0-9
Interface:    eth-0-9  ifindex: 9 state:   UP
Interface level configuration: NO ECHO, NO SLOW TMR
Timers in Milliseconds
Min Tx: 1  Min Rx: 1  Multiplier: 3
-------------------------------------------------------
Number of Sessions: 2
BFD discriminator: 8193   BFD state: DOWN
BFD discriminator: 8191   BFD state: DOWN
```

## Related Commands

None

# 13.15.12 sbfd NAME

## Command Purpose

Use this command to configure one Seamless BFD session.

Use the “no” form of this command to remove this configurations.

## Command Syntax

sbfd *NAME* peer-ip *A.B.C.D* interface ( *IFPHYSICAL* | *IFVLAN* | *IFAGG* ) ( source-ip *A.B.C.D* | )

no bfd *NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | sbfd session name | String with up to 16 characters |
| peer-ip A.B.C.D | BFD destination ip address | IP Address |
| interface | specify an interface for single hop bfd | Physical/vlan/agg interface |
| Source-ip A.B.C.D | specify source ip address | IP Address |

## Command Mode

Global Configuration

## Default

By default there is no SBFD session to be created.

## Usage

Use this command to specify the SBFD for static route. SBFD session is created, the bfd configurations need meet the following conditions:

- The destination ip address should be subnet with the ip address of the binded interface.
- The specified vrf should be same as that of the binded interface. If users don't specify the vrf, the bfd vrf would be default.
- The source ip address should be same as that of the binded interface. If users don't specify the source ip address, the source ip would be got from the binded interface, which is subnet with the destination ip address. If there are many ip addresses of the binded interface subnet the the destination ip address, the primary ip address would be selected firstly, and the smaller values of the ip adderss would be chosen secondly.

If users specify the local and remote discriminator, bfd uses them. Otherwise, the bfd local discriminator would be allocated by system.

## Examples

In the following example, user configures to create the sbfd session 'test':

```
Switch (config)# sbfd test peer-ip 9.9.9.2 interface eth-0-9
```

## Related Commands

ip route

# 13.15.13 sbfd-initiator

## Command Purpose

Use this command to create and enter sbfd initiator configure mode

Use the "no" form of this command to remove this mode.

### Command Syntax

sbfd-initiator

no sbfd-initiator

### Command Mode

Global Configuration

### Default

None

### Usage

Use this command to create and enter sbfd initiator configure mode.

### Examples

In the following example, the sbfd initiator configure mode will be created and entered:

```
Switch(config)# sbfd-initiator
Switch(config-sbfd-initiator)#
```

### Related Commands

None

## 13.15.14 sbfd-reflector

### Command Purpose

Use this command to enter sbfd reflector configure mode

Use the “no” form of this command to remove this mode.

### Command Syntax

sbfd- reflector

no sbfd- reflector

## Command Mode

Global Configuration

## Default

None

## Usage

Use this command to create and enter sbfd initiator configure mode.

## Examples

In the following example, the sbfd reflector configure mode will be created and entered:

```
Switch(config)# sbfd-reflector
Switch(config-sbfd-reflector)#
```

## Related Commands

None

# 13.15.15 remote-target

## Command Purpose

Use this command to configure remote-target discriminator

Use the “no” form of this command to remove it.

## Command Syntax

remote-target ipv4 *A.B.C.D DISCRIMINATOR*

no remote-target ipv4 *A.B.C.D*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| A.B.C.D | Ipv4 target for sbfd initiator | IP Address |
| DISCRIMINATOR | Remote discriminator for remote target | 1-4294967295 |

## Command Mode

Sbfd-initiator Configuration

## Default

None

## Usage

Use this command to configure remote discriminator for ipv4 target.

## Examples

In the following example, remote-discriminator for ipv4 target is set:

```
Switch(config-sbfd-initiator)# remote-target ipv4 12.1.1.2 1
```

## Related Commands

local-discriminator

# 13.15.16 local-discriminator

## Command Purpose

Use this command to configure local discriminator for sbfd reflector

Use the “no” form of this command to remove it.

## Command Syntax

local-discriminator ( dynamic | *DISCRIMINATOR* )

no local-discriminator

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| dynamic | Alloc the local discriminator dynamically | - |
| DISCRIMINATOR | Local discriminator configured for sbfd reflector | 1-256 |

## Command Mode

Sbfd-reflector Configuration

## Default

None.

## Usage

Use this command to configure local discriminator for sbfd reflector.

## Examples

In the following example, local discriminator for sbfd reflector is set:

```
Switch(config-sbfd-reflector)# local-discriminator 1
```

## Related Commands

remote-target

# 13.15.17 show sbfd target

## Command Purpose

Use this command to show the sbfd remote targets.

## Command Syntax

show sbfd target ( ipv4 | )

### Command Mode

Privileged EXEC

### Default

None.

### Usage

Use this command to show the sbfd remote targets.

### Examples

The following example is the result of this command:

```
Switch# show sbfd target ipv4
Static SBFD target status:
Target Address      Remote Discriminator
----------------------------------------
12.1.1.2            1
13.1.1.3            2
```

### Related Commands

remote-target

## 13.15.18 show bfd add-fail-session

### Command Purpose

Use this comment to see bfd session added to fail-list

### Command Syntax

show bfd add-fail-session

### Command Mode

Privileged EXEC

### Default

None.

### Usage

Use this comment to see bfd session added to fail-list

### Examples

The following example is the result of this command:

```
Switch# show bfd add-fail-session
DUT1# show bfd add-fail-session
============================================================
Name               Type           Src Ip           Dst Ip
ccc                single-hop       4.4.4.1          4.4.4.2
```

### Related Commands

None

## 13.16 UDP Helper Commands

### 13.16.1 ip udp-helper enable

### Command Purpose

Use this command to enable/disable the udp-helper.

### Command Syntax

ip udp-helper ( enable | disable )

### Command Mode

Global Configuration

### Default

Disable

### Usage

When ip udp-helper is enabled, the default udp dest port of 37, 49, 53, 69, 137, 138 will be configured.

### Examples

This example shows how to enable ip udp-helper

```
Switch# configure terminal
Switch(config)# ip udp-helper enable
```

### Related Commands

None

## 13.16.2 ip udp-helper port

### Command Purpose

Use this command to configure the udp helper port.Use the no form of this command to unset the udp helper port.

### Command Syntax

ip udp-helper port ( *NUM* | dns | netbios-ds | netbios-ns | tacacs | tftp | time )

no ip udp-helper port ( *NUM* | dns | netbios-ds | netbios-ns | tacacs | tftp | time )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NUM | UDP Destination Port NUM | <1-65535> |
| dns | Domain Name Service(53) | - |
| netbios-ds | NetBios datagram service(138) | - |
| netbios-ns | NetBios name service(137) | - |
| tacacs | TAC Access Control System(49) | - |
| tftp | Trivial File Transfer Protocol(69) | - |
| time | Time service(37) | - |

### Command Mode

Global Configuration

### Default

None

### Usage

None

### Examples

This example shows how to configure udp-helper port

```
Switch# configure terminal
Switch(config)# ip udp-helper port 30
```

This example shows how to unconfigure udp-helper port

```
Switch# configure terminal

Switch(config)# no ip udp-helper port 30
```

### Related Commands

None

## 13.16.3 ip udp-helper server

### Command Purpose

Use this command to configure the udp-helper server ip on interface.Use the no form of this command to clear the udp-helper server ip on interface.

### Command Syntax

ip udp-helper server *IP_ADDR*

ip udp-helper server ( *IP_ADDR* | )

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| IP_ADDR | IPv4 address | - |

## Command Mode

Interface Configuration

## Default

None

## Usage

The udp-helper server ip can only configured on L3 physical port or L3 agg port or vlaninterface.

Agg member port can't be configured.

## Examples

This example shows how to configure udp-helper server 1.1.1.1

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport
Switch(config-if)# ip udp-helper server 1.1.1.1
```

This example shows how to clear udp-helper server 1.1.1.1

```
Switch# configure terminal

Switch(config)# interface eth-0-1
Switch(config-if)# no switchport
Switch(config-if)# no ip udp-helper server 1.1.1.1
```

## Related Commands

None

# 13.16.4 show ip udp-helper server

## Command Purpose

Use this command to display the udp-helper server information.

## Command Syntax

show ip udp-helper server （interface *IFMANE* | ）

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFMANE | Interface Name | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to display the udp-helper server information

```
Switch# show ip udp-helper server
Switch# show ip udp-helper server
Interface      Server IP        Packet Received Packet Dropped
--------------+----------------+---------------+---------------
eth-0-1        1.1.1.1          0               0
```

## Related Commands

None

# 13.16.5 clear udp-helper statistics

## Command Purpose

Use this command to clear the statistics of udp-helper.

## Command Syntax

Clear udp-helper statistics (all | interface *IFNAME* )

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to clear udp-helper statistics on interface

```
Switch# clear udp-helper statistics all
```

## Related Commands

None

# 14 Device Management Commands

## 14.1 STM Commands

### 14.1.1 stm prefer

#### Command Purpose

Use the stm prefer Global Configuration command to configure the profile used in Switch Table Management (STM) resource allocation. You can use profile to allocate system memory to best support the features being used in your application. Use profile to approximate the maximum number of unicast MAC addresses, quality of service (QoS) access control entries (ACEs) and unicast routes. Use the no form of this command to return to the default profile.

#### Command Syntax

stm prefer ( default | layer3 | ipv6 | mpls | extended-buffer )

no stm prefer

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| default | Provide balance to all features | - |
| layer3 | Provide maximum Host Route/Indirect Route entries. You would typically use this profile for a router or aggregator in the middle of a network | - |
| ipv6 | Unicast bias, supporting more IPv6 Ucast Routes. This profile is only existed when IPv6 feature is supported. | - |

| | | |
|---|---|---|
| mpls | The mpls template supports the maximum number of MPLS/MAC entries. | - |
| extended-buffer | Extended-buffer bias, with more packet buffer. | - |

## Command Mode

Global Configuration

## Default

System use the default profile when first boot up, this profile balance all the features.

## Usage

Users must reload the switch for the configuration to take effect.

## Examples

This example shows how to configure the ipv4 profile on the switch. You can verify your settings by entering the show stm prefer in privileged EXEC mode:

```
Switch# configure terminal
Switch(config)# stm prefer layer3
Switch(config)# exit
Switch# reload
```

## Related Commands

show stm prefer

# 14.1.2 show stm prefer

## Command Purpose

Use the show stm prefer privileged EXEC command to display information about the profiles that can be used to maximize system resources for a particular feature, or use the command without a keyword to display the profile in use.

## Command Syntax

show stm prefer ( default | layer3 | ipv6 | mpls | extended-buffer | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| default | Provide balance to all features | - |
| layer3 | Provide maximum Host Route/Indirect Route entries. You would typically use this profile for a router or aggregator in the middle of a network | - |
| ipv6 | Unicast bias, supporting more IPv6 Ucast Routes. This profile is only existed when IPv6 feature is supported. | - |
| mpls | The mpls template supports the maximum number of MPLS/MAC entries. | - |
| extended-buffer | Extended-buffer bias, with more packet buffer. | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

If you did not reload the switch after entering the stm prefer Global Configuration command, the show stm prefer privileged EXEC command displays the profile currently in use and not the newly configured profile.

The numbers displayed for each profile represent an approximate maximum number for each feature resource.

## Examples

This is an example of output from the show stm prefer command, displaying the profile currently in use:

```
Switch# show stm prefer
Current profile is :default
   number of vlan instance                                : 1/4094
   number of vlan stats                                   : 0/128
   number of unicast mac address                          : 0/32768
   number of multicast mac address                        : 0/2048
   number of blackhole mac address                        : 0/128
   number of max applied vlan mapping                     : 0/1024
   number of bfd sessions                                 : 0/128
   number of CFM loacl&remote MEPs                        : 0/1024
   number of CFM lm                                       : 0/256
   number of CFM lck                                      : 0/24
   number of G8031 groups                                 : 0/256
   number of G8032 rings                                  : 0/256
   number of G8032 member ports                           : 0/256
   number of mac based vlan class                         : 0/512
   number of ipv4 based vlan class                        : 0/512
   number of ipv6 based vlan class                        : 0/0
   number of dot1x mac based                              : 0/256
   number of unicast ipv4 host routes                     : 0/3072
   number of unicast ipv4 indirect routes                 : 0/6144
   number of unicast ipv4 policy based routes             : 0/128
   number of unicast ipv6 host routes                     : 0/0
   number of unicast ipv6 indirect routes                 : 0/0
   number of unicast ecmp groups                          : 0/240
   number of unicast ip tunnel peers                      : 0/8
   number of multicast ipv4 routes                        : 0/1023
   number of mvr entries                                  : 0/511
   number of mvr6 entries                                 : 0/0
   number of multicast ipv6 routes                        : 0/0
   number of ipv4 source guard entries                    : 0/1024
   number of ingress security acl flow entries            : 0/2464
   number of ingress security acl flow stats              : 0/1022
   number of ingress qos flow entries                     : 0/1280
   number of ingress qos flow stats                       : 0/511
   number of ingress telnet flow entries                  : 0/64
   number of ingress ssh flow entries                     : 0/64
   number of ingress worm anti-attack flow entries        : 0/32
   number of ingress ipfix flow entries                   : 0/256
   number of ingress udf acl flow entries                 : 0/64
   number of ingress udf acl flow stats                   : 0/64
   number of ingress copp flow entries                    : 0/251
   number of ingress copp flow stats                      : 0/251
   number of egress security acl flow entries             : 0/928
   number of egress security acl flow stats               : 0/511
   number of egress ipfix flow entries                    : 0/512
   number of link aggregation (static & lacp)             : 0/64
   number of ipfix cache                                  : 0/4096
   number of mka policy                                   : 1/64
```

### Related Commands

stm prefer

## 14.2 Syslog Commands

### 14.2.1 clear logging buffer

#### Command Purpose

To clear messages from the logging buffer, use the clear logging buffer command in Privileged EXEC mode.

#### Command Syntax

clear logging buffer

#### Command Mode

Privileged EXEC

#### Default

None

#### Usage

Clear log messages in logging buffer

#### Examples

The following shows how to clear logging buffer:

```
Switch# clear logging buffer
```

#### Related Commands

show logging buffer

## 14.2.2 logging alarm-trap

### Command Purpose

To limit messages logged to the syslog servers based on severity, use the logging alarm-trap command in Global Configuration mode. To restore the default level, use the no form of this command.

### Command Syntax

logging alarm-trap ( enable | disable | level ( high | lower | middle | minor ) )

no logging alarm-trap level

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| enable | Enable logging traps | - |
| disable | Disable logging traps | - |
| level high | The high alarm level | - |
| level lower | The lower alarm level. | - |
| level middle | The middle alarm level | - |
| level minor | The minor alarm level | - |

### Command Mode

Global Configuration

### Default

Logging trap is disabled.

### Usage

A trap is an unsolicited message sent to a remote network management host. Logging traps should not be confused with SNMP traps.

### Examples

The following shows how to limit messages logged to the log servers based on severity:

```
Switch# configure terminal
Switch(config)# logging alarm-trap enable
Switch(config)# logging alarm-trap level high
```

### Related Commands

logging alarm-trap level middle

## 14.2.3 logging file

### Command Purpose

To enable writing logs into files, use the logging file command in Global Configuration mode.

### Command Syntax

logging file ( enable | disable )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| enable | Enable writing logs to file | - |
| disable | Disable writing logs to file | - |

### Command Mode

Global Configuration

### Default

Logging file is enabled

### Usage

If logging file will enabled, the log will be saved to flash:/syslog every 6 hours.

### Examples

The following shows how to enable logging file function:

```
Switch# configure terminal
Switch(config)# logging file enable
```

## Related Commands

show logging

# 14.2.4 logging level file

## Command Purpose

To set severity level while writing logs into files, use the logging level file command in Global Configuration mode. To return the logging to the default level, use the no form of this command.

## Command Syntax

logging level file ( alert | critical | debug | emergency | error | information | notice | warning | *SEVERITY_LEVEL* )

no logging level file

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| 0 \| emergency | System is unusable | - |
| 1 \| alert | Immediate action needed | - |
| 2 \| critical | Critical conditions | - |
| 3 \| error | Error conditions | - |
| 4 \| warning | Warning conditions | - |
| 5 \| notice | Normal but significant conditions | - |
| 6 \| information | Informational messages | - |
| 7 \| debug | Debugging messages | - |
| SEVERITY_LEVEL | Severity level | 0-7 |

## Command Mode

Global Configuration

## Default

Logging file level is inofrmation.

### Usage

Specifying a severity-level causes messages only at that level and numerically lower levels to files.

### Examples

In the following example, the user specifies that only messages of the levels error, critical, alerts, and emergency be logged to files:

```
Switch# configure terminal
Switch(config)# logging level file 3
```

### Related Commands

logging level module

## 14.2.5 logging buffer

### Command Purpose

To set the number of logs saved in system buffer, use the logging buffer command in Global Configuration mode. To return the logging to the default value, use the no form of this command.

### Command Syntax

logging buffer *BUFFERSIZE*

no logging buffer

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| BUFFERSIZE | logging buffer size | 10-1000 |

### Command Mode

Global Configuration

### Default

500

### Usage

Specifying the max number of messages showed in CLI show logging buffer.

### Examples

In the following example, the user save 1000 logging entries in system:

```
Switch# configure terminal
Switch(config)# logging buffer 1000
```

### Related Commands

show logging buffer

## 14.2.6 logging level module

### Command Purpose

To set severity level, use the logging level module command in Global Configuration mode. To return the logging to the default level, use the no form of this command.

### Command Syntax

logging level module ( alert | critical | debug | emergency | error | information | notice | warning | *SEVERITY_LEVEL* )

no logging level module

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| 0 \| emergency | System is unusable | - |
| 1 \| alert | Immediate action needed | - |
| 2 \| critical | Critical conditions | - |
| 3 \| error | Error conditions | - |
| 4 \| warning | Warning conditions | - |
| 5 \| notice | Normal but significant conditions | - |
| 6 \| information | Informational messages | - |
| 7 \| debug | Debugging messages | - |
| SEVERITY_LEVEL | Severity level | 0-7 |

### Command Mode

Global Configuration

### Default

Logging file level is debugging.

### Usage

Specifying a severity-level causes messages only at that level and numerically lower levels of the modules.

### Examples

In the following example, the user specifies that all messages be logged:

```
Switch# configure terminal
Switch(config)# logging level module debug
```

### Related Commands

logging level file

## 14.2.7 logging merge

### Command Purpose

To enable the logging mergence, use the logging merge command in Global Configuration mode. To restore to default value, use the no form of this command.

### Command Syntax

logging merge ( enable | disable | fifo-size *SIZE* | timeout *SECONDS* )

no logging merge ( fifo-size | timeout )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| enable | Enable logging mergence | - |
| disable | Disable logging mergence | - |

| | | |
|---|---|---|
| fifo-size SIZE | Set fifo size. The range is 100 to 10240, default value is 1024 | 100-10240 |
| timeout SECONDS | Set timeout. The range is 1 to 300 seconds, default value is 10 seconds | 1-300 |

## Command Mode

Global Configuration

## Default

Logging mergence is enabled.

## Usage

The logging merge command merges all the same logs into one during a specified time range. During this time, the switch buffered these same logs. You can use the timeout keyword to set the time range, and use the fifo-size to set the buffer size.

## Examples

The following shows how to enable logging merge function:

```
Switch# configure terminal
Switch(config)# logging merge enable
```

## Related Commands

logging merge timeout 30

# 14.2.8 logging sync

## Command Purpose

To synchronize log from buffer to syslog file, use the logging sync command in privileged EXEC mode.

## Command Syntax

logging sync

## Command Mode

Privileged EXEC

## Default

None

## Usage

When enabled log merge, system will merge all the same logs into one during a specified time range. During this time log will not send to logging buffer. If user wants to sync log to logging buffer, use this command. And synchronize log from buffer to syslog file.

## Examples

The following shows how to enable logging sync function:

```
Switch# logging sync
```

## Related Commands

logging merge enable

logging sync timeout

# 14.2.9 logging sync timeout

## Command Purpose

To set the timeout that synchronize log from buffer to syslog file. To restore to default value, use the no form of this command.

## Command Syntax

logging sync timeout *INTERVAL*

no logging sync timeout

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| INTERVAL | sync timeout in minutes | 5-1440 |

### Command Mode

Global Configuration

### Default

360 minutes

### Usage

None

### Examples

The following shows how to set every 5 minutes synchronize log from buffer to syslog file:

```
Switch# configure terminal
Switch(config)# logging sync timeout 5
```

### Related Commands

logging sync

## 14.2.10 logging operate

### Command Purpose

To log the operations, and use the logging operate command in Global Configuration mode.

### Command Syntax

logging operate ( enable | disable )

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| enable | Enable logging operations | - |
| disable | Disable logging operations | - |

### Command Mode

Global Configuration

### Default

Logging operations is disabled

### Usage

If logging operate is enabled, all the CLI in configure mode or higher will be save to logger buffer.

### Examples

The following shows how to enable logging operate function:

```
Switch# configure terminal
Switch(config)# logging operate enable
```

### Related Commands

logging server

## 14.2.11 logging server

### Command Purpose

To enable the logging to the remote logging servers, use the logging server command in Global Configuration mode.

### Command Syntax

logging server ( enable | disable )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| enable | Enable logging server | - |
| disable | Disable logging server | - |

## Command Mode

Global Configuration

## Default

Logging operations is disabled.

## Usage

This command is used to send logger to a remote server.

## Examples

The following shows how to use logging server command:

```
Switch# configure terminal
Switch(config)# logging server enable
```

## Related Commands

logging server severity

# 14.2.12 logging server address

## Command Purpose

To log system messages and debug output to a remote server, use the logging server address command in Global Configuration mode. To remove a specified logging server from the configuration, use the no form of this command.

## Command Syntax

logging server address ( mgmt-if | vrf *NAME* | ) ( *IPV4_ADDR* | *IPV6_ADDR* ) ( dest-port *PORT_NUM* | ) ( transport ( tcp | udp ) | ) ( source-interface *IFNAME* | source-ip *SRC_IP_ADDR* | )

no logging server address ( mgmt-if | vrf *NAME* | ) ( *IPV4_ADDR* | *IPV6_ADDR* )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| mgmt-if | Management port | - |

| | | |
|---|---|---|
| vrf NAME | vrf name of the server | - |
| IPV4_ADDR | IPv4 address of the server that will receive the system logging messages | IPv4 Address |
| IPV6_ADDR | IPv6 address of the server that will receive the system logging messages | IPv6 Address |
| PORT_NUM | Port number | 1-65535 |
| tcp | Transport type is tcp | TCP |
| udp | Transport type is udp | UDP |
| IFNAME | Name of source interface | All interface type |
| SRC_IP_ADDR | Source IP address | IPv4 Address |

## Command Mode

Global Configuration

## Default

System logging messages are not sent to any remote server.

Default transport type is UDP, default port is 514

## Usage

The logging server address command identifies a remote server (usually a device serving as a syslog server) to receive logging messages. By issuing this command more than once, you can build a list of servers that receive logging messages.

If the source interface or source IP address is specified, the packet transmit will use the related IP address as source address.

## Examples

In the following example, messages are logged to a server at 209.165.202.169:

```
Switch# configure terminal
Switch(config)# logging server address 209.165.202.169
```

## Related Commands

logging server

# 14.2.13 logging server facility

## Command Purpose

To configure the syslog facility in which error messages are sent, use the logging server facility command in Global Configuration mode. To revert to the default of local7, use the no form of this command.

## Command Syntax

logging server facility ( kern | user | mail | daemon | auth | syslog | lpr | news | uucp | cron | authpriv | ftp | *FACILITY_TYPE* | *FACILITY_LOCAL* )

no logging server facility

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| 0 \| kern | Kernel | - |
| 1 \| user | User | - |
| 2 \| mail | Mail system | - |
| 3 \| daemon | System daemon | - |
| 4 \| auth | Authorization system | - |
| 5 \| syslog | System log | - |
| 6 \| lpr | Line printer system | - |
| 7 \| news | USENET news | - |
| 8 \| uucp | UNIX-to-UNIX | - |
| 9 \| cron | Cron facility | - |
| 10 \| authpriv | Authorization priv system | - |
| 11 \| ftp | FTP sytem | - |
| 16 \| local0 | Reserved for locally defined messages | - |
| 17 \| local1 | Reserved for locally defined messages | - |
| 18 \| local2 | Reserved for locally defined messages | - |
| 19 \| local3 | Reserved for locally defined messages | - |
| 20 \| local4 | Reserved for locally defined messages | - |
| 21 \| local5 | Reserved for locally defined messages | - |

| | | |
|---|---|---|
| 22 \| local6 | Reserved for locally defined messages | - |
| 23 \| local7 | Reserved for locally defined messages | - |
| FACILITY_TYPE | system defined messages | 0-11 |
| FACILITY_LOCAL | Reserved for locally defined messages | 6-23 |

### Command Mode

Global Configuration

### Default

Default is local4

### Usage

None

### Examples

The following shows how to use logging file command:

```
Switch# configure terminal
Switch(config)# logging server facility local3
```

### Related Commands

logging server

## 14.2.14 logging server severity

### Command Purpose

To set severity level while writing logs into servers, use the logging server severity command in Global Configuration mode. To revert to the default severity level, use the no form of this command.

## Command Syntax

logging server severity ( alert | critical | debug | emergency | error | information | notice | warning | *SEVERITY_LEVEL* )

no logging server severity

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| 0 \| emergency | System is unusable | - |
| 1 \| alert | Immediate action needed | - |
| 2 \| critical | Critical conditions | - |
| 3 \| error | Error conditions | - |
| 4 \| warning | Warning conditions | - |
| 5 \| notice | Normal but significant conditions | - |
| 6 \| information | Informational messages | - |
| 7 \| debug | Debugging messages | - |
| SEVERITY_LEVEL | Severity level | 0-7 |

## Command Mode

Global Configuration

## Default

Logging server level is information.

## Usage

This command is used to set severity level while writing logs into servers.

## Examples

In the following example, the user specifies that only messages of the levels error, critical, alerts, and emergency be logged to server:

```
Switch# configure terminal
Switch(config)# logging server severity 3
```

## Related Commands

logging level module

logging level file

## 14.2.15 logging timestamp

### Command Purpose

To configure the system to apply a time-stamp to debugging messages or system logging messages, use the logging timestamps command in Global Configuration mode. To restore the default timestamp format, use the no form of this command.

### Command Syntax

logging timestamp ( bsd | date | iso | none | rfc3164 | rfc3339 )

no logging timestamp

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| bsd | BSD style (RFC 3164) | - |
| date | Date command style | - |
| iso | ISO style (RFC 3339) | - |
| none | No timestamp | - |
| rfc3164 | RFC 3164 style (bsd) | - |
| rfc3339 | RFC 3339 style (iso) | - |

### Command Mode

Global Configuration

### Default

Default timestamp format is BSD.

### Usage

This command is used to specify the timestamp in logger message.

### Examples

The following shows how to set the timestamp to iso.:

```
Switch# configure terminal
Switch(config)# logging timestamp iso
```

### Related Commands

show logging

## 14.2.16 show logging

### Command Purpose

To display the state of system logging (syslog), use the show logging command in privileged EXEC mode.

### Command Syntax

show logging

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following shows how to display the configuration of the log:

```
Switch# show logging
Current logging configuration:
============================================================
logging buffer 500
logging timestamp date
logging file enable
logging level file warning
logging level module debug
logging server disable
```

```
logging server severity warning
logging server facility local7
logging alarm-trap enable
logging alarm-trap level middle
logging merge disable
logging merge fifo-size 1024
logging merge timeout 10
logging operate disable
```

### Related Commands

logging level

## 14.2.17 show logging buffer

### Command Purpose

To display the contents of the standard system logging buffer, use the show logging buffer command in privileged EXEC mode.

### Command Syntax

show logging buffer ( *LINES* | statistics | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LINES | Specify the max number of logs.positive number means latest message displayed on top, negative number means the oldest message displayed on top. | -1000-1000 |
| statistics | Display statistics of logging buffers | - |

### Command Mode

Privileged EXEC

### Default

Display 20 messages when messages number is not specified. The latest message is displayed on top

### Usage

None

### Examples

The following shows how to use show logging buffer command:

```
Switch# show logging buffer statistics
Logging buffer statistics:
============================================================
Total processed 153 entries
Total dropped 0 entries
Current have 153 entries
The latest message is:
Aug  6 16:06:44 Switch3 IMISH-6: ready to service
The oldest message is:
Aug  6 13:38:38 Switch LOGGING-5: logging starting up; version=\'2.0rc4\'
```

### Related Commands

show logging

## 14.3 Mirror Commands

### 14.3.1 monitor session destination interface

### Command Purpose

Use this command to set mirror destination interface.

To remove this setting, use the no form of this command.

### Command Syntax

monitor session *SESSION-ID* destination interface *IFNAME*

no monitor session *SESSION* destination

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SESSION-ID | mirror session number | 1-3 |
| IFNAME | mirror destination interface | Support aggregation, physical and tunnel interfaces |

### Command Mode

Global Configuration

### Default

None

### Usage

Same session can't configure both local destination interface and remote destination VLAN.(About the remote destination VLAN, please refer to chapter "monitor session destination remote".)

### Examples

This example shows how to set the mirror destination port to eth-0-1 in session 1:

```
Switch# configure terminal
Switch(config)# monitor session 1 destination interface eth-0-1
```

This example shows how to remove this setting:

```
Switch# configure terminal
Switch(config)# no monitor session 1 destination
```

### Related Commands

monitor session SESSION-ID source interface

monitor session SESSION-ID source vlan

show monitor

## 14.3.2 monitor session destination cpu

### Command Purpose

Use this command to set mirror destination of cpu.

To remove this setting, use the no form of this command.

## Command Syntax

monitor session *SESSION-ID* destination cpu

no monitor session *SESSION-ID* destination

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SESSION-ID | mirror session number | 1-3 |
| destination cpu | mirror destination cpu | - |

## Command Mode

Global Configuration

## Default

None

## Usage

The destination can be cpu port.

Same session can't configure both destination cpu and remote destination VLAN.(About the remote destination VLAN, please refer to chapter "monitor session destination remote".)

## Examples

This example shows how to set the mirror destination to cpu in session 1:

```
Switch# configure terminal
Switch(config)# monitor session 1 destination cpu
```

This example shows how to remove this setting:

```
Switch# configure terminal
Switch(config)# no monitor session 1 destination
```

## Related Commands

monitor session SESSION-ID source interface

monitor session SESSION-ID source vlan

show monitor

## 14.3.3 monitor session destination group

### Command Purpose

Use this command to create mirror multi destination group and enter mirror destination group mode.

To remove this setting, use the no form of this command.

### Command Syntax

monitor session *SESSION-ID* destination group *GROUP-ID*

no monitor session *SESSION-ID* destination

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SESSION-ID | mirror session number | 1-3 |
| Destination group GROUP-ID | mirror destination group id number | 1-32 |

### Command Mode

Global Configuration

### Default

None

### Usage

Only one session can configure to multi-dest group. The session type only support local destination interface. One session can have multi destination group members which port is physical port. Same session can't configure both local destination interface and remote destination VLAN.(About the remote destination VLAN, please refer to chapter "monitor session destination remote".)

### Examples

This example shows how to create the mirror to multi-destination group in session 1.:

```
Switch# configure terminal
Switch(config)# monitor session 1 destination group 1
```

This example shows how to remove this setting:

```
Switch# configure terminal
Switch(config)# no monitor session 1 destination
```

### Related Commands

monitor session SESSION-ID source interface

member

show monitor

## 14.3.4 member

### Command Purpose

Use this command to add a group member mirror destination interface for a mirror destination group.

To remove this setting, use the no form of this command.

### Command Syntax

member *IFPHYSICAL*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFPHYSICAL | mirror destination interface | Support physical ports |

### Command Mode

Mirror Destination Group Configuration

### Default

None

## Usage

The destination interface only can be physical port. It can be neither VLAN interface nor Aggregator interface.

Same session can't configure both local destination interface and multi-destination interface

## Examples

This example shows how to add the mirror destination eth-0-1 to group of multi-destination session:

```
Switch# configure terminal
Switch(config)# monitor session 1 destination group 1
Switch(config-monitor-d-group)# member eth-0-1
```

This example shows how to remove this setting:

```
Switch# configure terminal
Switch(config)# monitor session 1 destination group 1
Switch(config-monitor-d-group)# no member eth-0-1
```

## Related Commands

monitor session SESSION-ID source interface

monitor session SESSION-ID destination group GROUP-ID

show monitor

# 14.3.5 monitor session source interface

## Command Purpose

Use this command to set mirror source interface.

To remove this setting, use the no form of this command.

## Command Syntax

monitor session *SESSION-ID* source interface interface ( both | tx | rx )

no monitor session *SESSION-ID* source interface *IFNAME* ( both | tx | rx )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SESSION-ID | mirror session number | 1-3 |
| source interface IFNAME | mirror source interface | Support aggregation and physical interfaces |
| both | monitor received and transmitted traffic on that interface | - |
| rx | monitor received traffic only on that interface | - |
| tx | monitor transmitted traffic only on that interface | - |

## Command Mode

Global Configuration

## Default

None

## Usage

The mirror source interface can be either physical port or Aggregator interface. (e.g. eth-0-1, agg1).

If the parameter for direction [both|tx|rx] is not specified, the default value is both.

## Examples

This example shows how to remove this setting.:

```
Switch# configure terminal
Switch(config)# monitor session 1 source interface eth-0-11
```

This example shows how to remove this setting:

```
Switch# configure terminal
Switch(config)# no monitor session 1 source interface eth-0-11
```

## Related Commands

monitor session SESSION-ID destination

show monitor

## 14.3.6 monitor session source vlan

### Command Purpose

Use this command to set mirror source vlan.

To remove this setting, use the no form of this command.

### Command Syntax

monitor session *SESSION-ID* source vlan *VLAN-ID* ( both | tx | rx )

no monitor session *SESSION-ID* source vlan *VLAN-ID* ( both | tx | rx )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SESSION-ID | mirror session number | 1-3 |
| VLAN-ID | the source vlan id to be mirrored | 1-4094 |
| both | monitor received and transmitted traffic on that interface | - |
| rx | monitor received traffic only on that interface | - |
| tx | monitor transmitted traffic only on that interface | - |

### Command Mode

Global Configuration

### Default

None

### Usage

If the parameter for direction (both|tx|rx) is not specified, the default value is both.

Before configure the monitor session source vlan, User should create vlan by command “vlan database”, and create vlan interface by command “interface vlan” first.

## Examples

This example shows how to create vlan and vlan interface:

```
Switch# configure terminal
Switch(config)# vlan database
Switch(config-vlan)# vlan 2
Switch(config-vlan)# exit
Switch(config)#interface vlan2
Switch(config-if)#exit
```

This example shows how to set the mirror source to vlan2 in session 1:

```
Switch# configure terminal
Switch(config)# monitor session 1 source vlan 2 both
```

This example shows how to set the mirror source to vlan2 in session 1 to monitor received traffic only:

```
Switch# configure terminal
Switch(config)# monitor session 1 source vlan 2 rx
```

This example shows how to set the mirror source to vlan2 in session 1 to monitor transmitted traffic only:

```
Switch# configure terminal
Switch(config)# monitor session 1 source vlan 2 tx
```

This example shows how to remove this setting:

```
Switch# configure terminal
Switch(config)#no monitor session 1 source vlan 2 both
```

This example shows how to delete vlan and vlan interface:

```
Switch# configure terminal
Switch(config)#no interface vlan2
Switch(config)# vlan database
Switch(config-vlan)# no vlan 2
Switch(config-vlan)# exit
```

## Related Commands

monitor session destination

show monitor

vlan database

vlan VLAN-ID

interface vlan VLAN-ID

## 14.3.7 monitor session source cpu

### Command Purpose

Use this command to set mirror source cpu

To remove this setting, use the no form of this command.

### Command Syntax

monitor session *SESSION-ID* source cpu ( both | tx | rx )

no monitor session *SESSION-ID* source cpu ( both | tx | rx )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SESSION-ID | mirror session number | 1-3 |
| cpu | set cpu to be mirrored | - |
| both | monitor received and transmitted traffic on that interface | - |
| rx | monitor received traffic only on that interface | - |
| tx | monitor transmitted traffic only on that interface | - |

### Command Mode

Global Configuration

### Default

None

## Usage

If the parameter for direction (both|tx|rx) is not specified, the default value is both.

Mirror source cpu can only be configured in session 1.

## Examples

This example shows how to set the mirror source to cpu in session 1:

```
Switch# configure terminal
Switch(config)# monitor session 1 source cpu both
```

This example shows how to set the mirror source to cpu in session 1 to monitor received traffic only:

```
Switch# configure terminal
Switch(config)# monitor session 1 source cpu rx
```

This example shows how to set the mirror source to cpu in session 1 to monitor transmitted traffic only:

```
Switch# configure terminal
Switch(config)# monitor session 1 source cpu tx
```

This example shows how to remove this setting:

```
Switch# configure terminal
Switch(config)#no monitor session 1 source cpu both
```

## Related Commands

monitor session destination

show monitor

# 14.3.8 monitor session destination interface tunnel

## Command Purpose

Use this command to set erspan mirror destination interface tunnel.

To remove this setting, use the no form of this command.

## Command Syntax

monitor session *SESSION-ID* destination interface *IFTUNNEL*

no monitor session *SESSION-ID* destination interface *IFTUNNEL*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SESSION-ID | <1-3> mirror session number | 1-3 |
| IFTUNNEL | <0-1023> ERSPAN monitor destination tunnel | 0-1023 |

## Command Mode

Global Configuration

## Default

None

## Usage

The destination tunnel and its mode should be created before configuring ERSPAN monitor destination.

The ERSPAN destination interface can only be a tunnel interface.

About tunnel configuration, please refer to "IPv6_Service_CLI_en.doc"

## Examples

This example shows how to create the tunnel::

```
Switch# configure terminal
Switch (config)# interface tunnel
Switch (config-vlan)# tunnel mode erspan
Switch (config-vlan)# exit
```

This example shows how to set the ERSPAN mirror destination to tunnel1 in session 1::

```
Switch# configure terminal
Switch(config)# monitor session 1 destination interface tunnel1
```

This example shows how to remove this setting::

```
Switch# configure terminal
Switch(config)# no monitor session 1 destination
```

This example shows how to delete the tunnel::

```
Switch# configure terminal
Switch (config)# no interface tunnel1
Switch (config-vlan)# exit
```

### Related Commands

monitor session SESSION-ID source interface

monitor session SESSION-ID source vlan

interface tunnel

tunnel mode mode

## 14.3.9 monitor session destination remote

### Command Purpose

Use this command to set mirror remote destination vlan and interface.

To remove this setting, use the no form of this command.

### Command Syntax

monitor session *SESSION-ID* destination remote vlan *VLAN-ID* interface *IFNAME*

no monitor session *SESSION-ID* destination remote vlan

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SESSION-ID | mirror session number | 1-3 |
| VLAN-ID | Remote mirror destination VLAN id | 2-4094 |
| IFNAME | the out-going interface for mirrored packets | Support aggregation and physical interfaces |

### Command Mode

Global Configuration

## Default

None

## Usage

The destination vlan should be created in vlan database.

The destination interface can be either physical port or Aggregator interface.

To prevent another copy of packets flood out from the destination outgoing port, user can remove the port from default vlan by command “switchport trunk allowed vlan remove 1”.

## Examples

This example shows how to create the vlan:

```
Switch# configure terminal
Switch(config)# vlan database
Switch(config-vlan)# vlan 2
Switch(config-vlan)# exit
```

This example shows how to set the mirror remote destination vlan to 2 and outgoing port to eth-0-1 in session 1:

```
Switch# configure terminal
Switch(config)# monitor session 1 destination remote vlan 2 interface eth-0-1
```

This example shows how to remove this setting:

```
Switch# configure terminal
Switch(config)# no monitor session 1 destination remote vlan
```

This example shows how to delete the vlan:

```
Switch# configure terminal
Switch(config)# vlan database
Switch(config-vlan)# no vlan 2
Switch(config-vlan)# exit
```

## Related Commands

monitor session SESSION-ID source interface

monitor session SESSION-ID source vlan

vlan database

vlan VLAN-ID

## 14.3.10 monitor mac escape

### Command Purpose

Use this command to set remote mirror Mac escape feature. When these escape entries are set, the packets with specified MAC-DA will not be mirrored to the remote destination vlan when using Rspan(unsupport ERSPAN) .

To remove this setting, use the no form of this command.

### Command Syntax

monitor mac escape *MAC MASK*

no monitor mac escape ( *MAC MASK* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MAC | mac address | mac address in HHHH. HHHH. HHHH format |
| MASK | mac address mask | mac address mask in HHHH. HHHH. HHHH format |

### Command Mode

Global Configuration

### Default

None

### Usage

Mac escape is used for remote mirror. It will not affect the result of local mirror.

If a Mac escape entry is set, the packet with this Mac destination can not be mirrored in remote mirror.

Command “no monitor mac escape ” should delete the specified entry.

Command “no monitor mac escape” should delete all entries.

## Examples

This example shows how to set the mirror mac escape:

```
Switch# configure terminal
Switch(config)# monitor mac escape 00cc.1122.3344 ffff.ffff.0000
```

This example shows how to remove this setting:

```
Switch# configure terminal
Switch(config)# no monitor mac escape 00cc.1122.3344 ffff.ffff.0000
```

## Related Commands

monitor session SESSION-ID destination remote

# 14.3.11 show monitor

## Command Purpose

Use this command to show the information about monitor.

## Command Syntax

show monitor ( session *SESSION-ID* )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SESSION-ID | mirror session number | 1-3 |

## Command Mode

Privileged EXEC

## Default

None

## Usage

If session id is not specified, any configured sessions should be shown.

## Examples

This example shows how to display the information about monitor:

```
DUT1# show monitor
session 1
Session   1
----------
Status              : Valid
Type                : Local Session
Source Ports        :
  Receive Only      :
  Transmit Only     :
  Both              : eth-0-2
Source VLANs        :
  Receive Only      :
  Transmit Only     :
  Both              :
Destination Port    : eth-0-1
```

## Related Commands

monitor session SESSION-ID source interface

monitor session SESSION-ID source vlan

monitor session SESSION-ID source cpu

monitor session SESSION-ID destination interface

monitor session SESSION-ID destination remote

monitor session SESSION-ID destination cpu

# 14.3.12 show monitor mac escape

## Command Purpose

Use this command to show mac escape settings for remote mirror.

## Command Syntax

show monitor mac escape

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to display the information about monitor mac escape:

```
Switch# show monitor mac escape
------------------------------------------------------------
           monitor rspan mac escape database
------------------------------------------------------------
count   : 1
------------------------------------------------------------
 Mac     : 00:cc:11:22:33:44
 Mask    : ff:ff:ff:ff:00:00
------------------------------------------------------------
```

## Related Commands

monitor mac escape MAC MASK

# 14.3.13 monitor destination forwarding enable

## Command Purpose

Use this command to set mirror destination port forwarding enable.

To remove this setting, use the no form of this command.

## Command Syntax

monitor destination forwarding enable

no monitor destination forwarding enable

## Command Mode

Global Configuration

### Default

Disabled

### Usage

If any mirror destination is configured, this feature can't be changed.

### Examples

This example shows how to set mirror destination forwarding enable:

```
Switch# configure terminal
Switch(config)# monitor destination forwarding enable
```

### Related Commands

monitor session SESSION-ID destination

show monitor

## 14.3.14 monitor cpu set packet buffer

### Command Purpose

Use this command to set mirror cpu buffer size, its default value is 1000 of packets.

To remove this setting, use the no form of this command.

### Command Syntax

monitor cpu set packet buffer *SIZE*

no monitor cpu set packet buffer

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SIZE | buffer size in packets | 1-1000, unit:packet |

### Command Mode

Global Configuration

## Default

Default 1000

## Usage

The mirror cpu buffer can store up to 1000 packets and the default value is 1000.

## Examples

This example shows how to set mirror cpu buffer size:

```
Switch# configure terminal
Switch(config)# monitor cpu set packet buffer 50
```

## Related Commands

show monitor cpu packet buffer size

# 14.3.15 monitor cpu capture packet

## Command Purpose

Use this command to capture packets to be written in a text file from cpu memory buffer.

## Command Syntax

monitor cpu capture packet ( start | stop )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| start | start capture | - |
| stop | stop captrue | - |

## Command Mode

Privileged EXEC

## Default

stop

## Usage

When start capturing packet, the cpu mirror packets will be written in a text file and the file name is assigned by system. The text file is stored in the directory of flash/mirror/

## Examples

This example shows how to start cpu capturing packets in a text file:

```
Switch# configure terminal
Switch(config)# monitor cpu capture packet start
```

This example shows how to stop cpu capturing packets in a text file:

```
Switch# configure terminal
Switch(config)# monitor cpu capture packet stop
```

## Related Commands

pcap convert FILENAMEA FILENAMEB

# 14.3.16 monitor cpu capture strategy

## Command Purpose

Use this command to set the trategy of capturing packets.

## Command Syntax

monitor cpu capture strategy ( replace | drop )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| replace | the oldest packet would be replaced by the latest packet when cpu mirror memory buffer is full | - |
| drop | the latest packet would be discard when cpu mirror memory buffer is full | - |

## Command Mode

Global Configuration

## Default

replace

## Usage

None

## Examples

This example shows how to set cpu capture strategy as replace:

```
Switch# configure terminal
Switch(config)# monitor cpu capture strategy replace
```

This example shows how to set cpu capture strategy as drop:

```
Switch# configure terminal
Switch(config)# monitor cpu capture strategy drop
```

## Related Commands

show monitor cpu capture strategy

# 14.3.17 show monitor cpu packet

## Command Purpose

Use this command to show the mirror cpu packets in memory.

## Command Syntax

show monitor cpu packet ( all | *PACKET-ID* )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| all | show all of mirror cpu packets in memory | - |
| PACKET-ID | show the mirror cpu packets of user specifying | 1-1000 |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to display the all mirror cpu packets in memory:

```
Switch(config)# show monitor cpu packet all
```

### Related Commands

monitor session SESSION-ID destination cpu

## 14.3.18 clear monitor cpu packet all

### Command Purpose

Use this command to clear the mirror cpu packets in memory.

### Command Syntax

clear monitor cpu packet all

### Command Mode

Privileged EXEC

### Default

None

### Usage

clear all the mirror cpu packets in memory.

### Examples

This example shows how to clear all the mirror cpu packets in memory buffer:

```
Switch(config)# clear monitor cpu packet all
```

### Related Commands

show monitor cpu packet (all|<1-1000>)

## 14.3.19 show monitor cpu packet buffer-size

### Command Purpose

Use this command to show the buffer size of mirror cpu in memory

### Command Syntax

show monitor cpu packet buffer-size

### Command Mode

Privileged EXEC

### Default

None

### Usage

It displays the mirror cpu buffer size in memory and the size intends the number of packets.

### Examples

This example shows how to show the mirror cpu buffer size in memory:

```
Switch(config)# show monitor cpu packet buffer-size
```

### Related Commands

monitor cpu set packet buffer <1-1000>

## 14.3.20 show monitor cpu capture strategy

### Command Purpose

Use this command to show the current strategy of capturing packets.

### Command Syntax

show monitor cpu capture strategy

### Command Mode

Privileged EXEC

### Default

None

### Usage

It display the current strategy of capturing mirror cpu packets in memory.

### Examples

This example shows how to show the current capture strategy:

```
Switch(config)# show monitor cpu capture strategy
```

### Related Commands

monitor cpu capture strategy (replace|drop)

# 14.4 Device Management Commands

## 14.4.1 temperature

### Command Purpose

To specify the system temperature monitor threshold.

### Command Syntax

termperature *LOW HIGH CRITICAL*

no termperature

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LOW | Low alarm temperature degree Celsius | 45-50, unit:degree Celsius |
| HIGH | High alarm temperature degree Celsius | 50-85, unit:degree Celsius |
| CRITICAL | Critical alarm temperature degree Celsius | 55-100, unit:degree Celsius |

### Command Mode

Global Configuration

### Default

The default threshold is low temperature 5, high temperature 75, and critical temperature 90.

### Usage

The unit for temperature is centigrade.

The critical temperature must higher than high temperature 5 Celsius degrees.

The high temperature must higher than low temperature 5 Celsius degrees.

### Examples

This example shows how to specify the temperature thresholds:

```
Switch# configure terminal
Switch(config)# temperature 5 70 90
```

### Related Commands

show environment

## 14.4.2 show environment

### Command Purpose

Use this command to show the hardware environment information.

### Command Syntax

show environment ( slot *ID* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ID | The ID of stack member. | 1-29 |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to display hardware environment information:

```
Switch# show environment
Fan tray status:
```

```
Index      Status
1          PRESENT
FanIndex    Status SpeedRate Mode
1-1         OK      30%      Auto
1-2         OK      30%      Auto
1-3         OK      30%      Auto
-------------------------------------------------------
Power status:
Index      Status     Power      Type       Alert
1          PRESENT    OK         AC         NO
2          ABSENT     -          -          -
-------------------------------------------------------
Sensor status (Degree Centigrade):
Index Temperature  Lower_alarm  Upper_alarm Critical_limit
1     64           5            75          90
```

## Related Commands

temperature

# 14.4.3 boot system

## Command Purpose

Use this command to specify the system image that the switch loads at startup.

## Command Syntax

boot system ( *GFLASHFILE* | *tftp:* mgmt-if *IP_ADDR GTFTPFLIE* )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| GFLASHFILE | The file name that will be used to load at startup | File path and name on the flash |
| IP_ADDR | The tftp server IP address | IPv4 Address |
| tftp: mgmt-if | Use management port | - |
| GTFTPFLIE | The file name that will be used to load at startup | File name on the tftp server |

## Command Mode

Privileged EXEC

## Default

None

### Usage

None

### Examples

This example shows how to specify load image from tftp when switch startup:

```
Switch# boot system tftp: mgmt-if 10.10.29.160 uImage.r
```

### Related Commands

None

## 14.4.4 show transceiver

### Command Purpose

Use this command to show the transceiver information.

### Command Syntax

show transceiver ( interface | ) ( detail | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| interface | Specify the physical interface | - |
| detail | Show detail include DDM information | - |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

## Examples

This example shows how to display transceiver information:

```
Switch# show transceiver detail
Port eth-1-2 transceiver info:
Transceiver Type: 10G Base-SR
Transceiver Vendor Name : OEM
Transceiver PN          : SFP-10GB-SR
Transceiver S/N         : 201033PST1077C
Transceiver Output Wavelength: 850 nm
Supported Link Type and Length:
      Link Length for 50/125um multi-mode fiber: 80 m
      Link Length for 62.5/125um multi-mode fiber: 30 m
-------------------------------------------------------------------------------
Transceiver is internally calibrated.
mA: milliamperes, dBm: decibels (milliwatts), NA or N/A: not applicable.
++ : high alarm, +  : high warning, -  : low warning, -- : low alarm.
The threshold values are calibrated.
-------------------------------------------------------------------------------
             High Alarm   High Warn   Low Warn    Low Alarm
Temperature   Threshold    Threshold    Threshold     Threshold
Port  (Celsius)       (Celsius)     (Celsius)     (Celsius)       (Celsius)
--------- ------------------  ----------  ----------  ----------  ----------
eth-1-2  25.92       95.00         90.00      -20.00        -25.00
-------------------------------------------------------------------------------
---------------
                   High Alarm   High Warn   Low Warn    Low Alarm
       Voltage     Threshold     Threshold   Threshold     Threshold
Port     (Volts)       (Volts)       (Volts)       (Volts)        (Volts)
--------- ----------------- ----------------  ----------------  ---------------  --
-------------
eth-1-2   3.32        3.80         3.70        2.90          2.80
-------------------------------------------------------------------------------
----------------
                    High Alarm   High Warn   Low Warn    Low Alarm
         Current     Threshold     Threshold   Threshold     Threshold
Port   (milliamperes)  (mA)          (mA)         (mA)         (mA)
--------- ------------------  ---------------  ----------------  -----------------
-------------
eth-1-2    6.41        20.00       18.00       1.00           0.50
-------------------------------------------------------------------------------
------------------
        Optical      High Alarm   High Warn   Low Warn    Low Alarm
     Transmit Power   Threshold    Threshold    Threshold     Threshold
Port   (dBm)          (dBm)        (dBm)        (dBm)        (dBm)
--------- ------------------  ---------------  ----------------  ----------------
---------------
eth-1-2    -2.41        2.01        1.00         -6.99         -7.96
-------------------------------------------------------------------------------
--------------------
        Optical      High Alarm   High Warn    Low Warn    Low Alarm
     Receive Power    Threshold    Threshold     Threshold     Threshold
Port    (dBm)          (dBm)        (dBm)        (dBm)        (dBm)
--------- ------------------  ---------------  -----------------  ----------------
```

```
---------------
eth-1-2     -12      -     1.00        0.00        -19.00      -20.00
-------------------------------------------------------------------------------
--------------------
```

## Related Commands

None

# 14.4.5 update bootrom

## Command Purpose

Use this command to update bootrom image.

## Command Syntax

update bootrom ( flash | udisk )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| flash | Source file direction | - |
| udisk | Source file direction | - |

## Command Mode

Global Configuration

## Default

None

## Usage

None

## Examples

This example shows how to update bootrom image:

```
Switch# configure terminal
Switch(config)# update bootrom flash:/boot/ bootrom.bin
```

## Related Commands

None

# 14.4.6 show reboot-info

## Command Purpose

Use this command to show reboot info.

## Command Syntax

show reboot-info ( slot *ID* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ID | The ID of stack member. | 1-29 |

## Command Mode

Privileged EXEC

## Default

None

## Usage

| Reboot Type | Description |
|---|---|
| POWER | Power outages |
| MANUAL | Cli “reboot/reload” undersystem |
| HIGH-TMPR | Reboot for abnormal high temperature |
| BHMDOG | BHM watchdog, monitor functional module |
| LCMDOG | LCM watchdog, monitor each LC |
| SCHEDULE | Schedule reboot |
| SNMP-RELOAD | SNMP reboot |
| HALFAIL | Reboot for HAGT communicate with HSRV failed，need stack enable |
| ABNORMAL | Unusual reboot, include reboot under shell |
| CTCINTR | Button reboot |

| | |
|---|---|
| LCATTACH | Reboot for LC attach CHSM failed |
| OTHER | Other reboot |

### Examples

This example shows how to show reboot-info:

```
Switch# show reboot-info
Times      Reboot Type     Reboot Time (UTC)
----------+---------------+-------------------
1          MANUAL          2023-01-04 20:54:22
2          MANUAL          2023-01-04 21:00:30
3          MANUAL          2023-01-04 21:06:53
4          MANUAL          2023-01-04 21:10:13
5          MANUAL          2023-01-04 21:14:16
6          MANUAL          2023-01-04 21:20:50
```

### Related Commands

None

## 14.4.7 clear reboot-info

### Command Purpose

Use this command to clear reboot info.

### Command Syntax

clear reboot-info ( slot *ID* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ID | The ID of stack member. | 1-29 |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to show reboot-info:

```
Switch# show reboot-info
Times       Reboot Type     Reboot Time
1           POWER           2024-11-04 14:13:04
2           MANUAL          2024-11-04 14:29:45
3           MANUAL          2024-11-04 15:47:02
4           POWER           2024-11-05 17:03:07
5           MANUAL          2024-11-05 17:10:50
6           MANUAL          2024-11-06 13:55:30
7           POWER           2024-11-13 09:15:51
8           MANUAL          2024-11-28 13:56:57
9           POWER           2024-12-05 09:18:35
10          POWER           2024-12-31 15:40:24
Switch# clear reboot-info
Switch# show reboot-info
Times       Reboot Type     Reboot Time
Switch#
```

### Related Commands

None

## 14.5 Bootrom Commands

### 14.5.1 version

### Command Purpose

Use the version command to show the Bootrom version information.

### Command Syntax

version

### Command Mode

BootRom CLI

### Default

None

### Usage

None

### Examples

This example shows how to show the U-boot version:

```
bootrom:> version

U-Boot A.1.0 (Jun 25 2018 - 12:32:40)
aarch64-linux-gnu-gcc (Linaro GCC 6.3-2017.02) 6.3.1 20170109
GNU ld (Linaro_Binutils-2017.02) 2.27.0.20161019
```

### Related Commands

None

## 14.5.2 setenv

### Command Purpose

Use this command to set Bootrom environment variables.

### Command Syntax

setenv ( ipaddr | serverip *IP_ADDR* | bootcmd boot arguments )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IP_ADDR | Local device or tftp server IP address | IPv4 Address |
| boot arguments | Boot form flash or tftp server | - |

### Command Mode

BootRom CLI

### Default

None

### Usage

None

### Examples

This example shows how to set Switch IP address as environment variables:

```
bootrom:> setenv ipaddr 10.10.29.48
```

This example shows how to set TFTP server IP address as environment variables:

```
bootrom:> setenv serverip 10.10.29.160
```

This example shows how to set boot command as environment variables:

```
bootrom:> setenv bootcmd boot_flash OS-ma-v3.0.1.it.r.bin
```

### Related Commands

None

## 14.5.3 saveenv

### Command Purpose

Use the saveenv command to save the Bootrom environment variables to persistent storage.

### Command Syntax

saveenv

### Command Mode

BootRom CLI

### Default

None

### Usage

None

### Examples

This example shows how to save the Bootrom environment variables:

```
bootrom:> saveenv
```

### Related Commands

printenv

## 14.5.4 printenv

### Command Purpose

Use the printenv command to show the U-boot environment variables.

### Command Syntax

printenv

### Command Mode

BootRom CLI

### Default

None

### Usage

None

## Examples

This example shows how to show the Bootrom environment variables:

```
bootrom:> printenv
baudrate=115200
bootargs=console=ttyS0,115200 root=/dev/ram0 earlycon=uart8250,mmio,0x21c0500
mtdparts=spi0.0:1m(uboot),5m(kernel),1m(dtb),9m(file_system)
bootimage=TftpFile://10.10.38.160:switchOS-e550-v6.0.1.33.r.bin U-Boot A.1.0
selfip=10.10.39.83 eeprom info=ff ff ff ff ff ff ff ff ff ff
bootcmd=boot flash
bootdelay=10
eth1addr=00:1E:08:11:06:5C
ethact=FM1@DTSEC3
ethaddr=00:1E:08:11:06:5C
ethprime=FM1@DTSEC3
fdtcontroladdr=fbc26638
fman ucode=fbc33650
ipaddr=10.10.39.83
serverip=10.10.38.160
stderr=serial
stdin=serial
stdout=serial

Environment size: 576/8188 bytes
```

## Related Commands

setenv

# 14.5.5 reset

## Command Purpose

Use the reset command to perform RESET of the CPU.

## Command Syntax

reset

## Command Mode

BootRom CLI

### Default

None

### Usage

None

### Examples

This example shows how to RESET the CPU in Bootrom:

```
bootrom:> reset
```

### Related Commands

saveenv

## 14.5.6 ping

### Command Purpose

Use the ping command to send ICMP ECHO_REQUEST to network host.

### Command Syntax

ping *IP_ADDR*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IP_ADDR | remote host IP address | IPv4 Address |

### Command Mode

BootRom CLI

### Default

None

### Usage

None

### Examples

This example shows how to use ping command in Bootrom mode:

```
Bootrom:> ping 10.10.38.160
Using FM1@DTSEC3 device
host 10.10.38.160 is alive
```

### Related Commands

saveenv

## 14.5.7 ctcls

### Command Purpose

Use the ls command to list files in a directory (default is /).

### Command Syntax

ctcls

### Command Mode

BootRom CLI

### Default

None

### Usage

None

### Examples

This example shows how to list files in a directory (default is /).:

```
Bootrom:>ctcls
Bootrom:> ctcls
<DIR>       4096 .
<DIR>       4096 ..
<DIR>      16384 lost+found
<DIR>       4096 boot
<DIR>       4096 cfg
<DIR>       4096 info
<DIR>       4096 log
<DIR>       4096 conf
<DIR>       4096 cold
<DIR>       4096 reboot-info
<DIR>       4096 monitor
<DIR>       4096 capwap
            1682 startup-config.conf
```

### Related Commands

None

## 14.5.8 boot_tftp

### Command Purpose

Use the boot_tftp command to boot system through the specified system image from TFTP server.

### Command Syntax

*boot_tftp IMAGE_NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IMAGE_NAME | Image name of tftp server | - |

### Command Mode

BootRom CLI

### Default

None

## Usage

None

## Examples

This example shows how to boot system form TFTP server:

```
bootrom:> boot_tftp OS-ma-v3.0.1.it.r.bin
```

## Related Commands

None

# 14.5.9 boot_tftp_nopass

## Command Purpose

Use the boot_tftp_nopass command to boot system through the specified system image from TFTP server with default configuration.

## Command Syntax

*boot_tftp_nopass IMAGE_NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IMAGE_NAME | Image name of tftp server | - |

## Command Mode

BootRom CLI

## Default

None

## Usage

None

## Examples

This example shows how to boot system form TFTP server:

```
bootrom:> boot_tftp_nopass OS-ma-v3.0.1.it.r.bin
```

## Related Commands

None

# 14.5.10 boot_flash

## Command Purpose

Use the boot_flash command to boot system through the specify image or default image in the flash

## Command Syntax

*boot_flash IMAGE_NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IMAGE_NAME | Image name in flash | - |

## Command Mode

BootRom CLI

## Default

None

## Usage

None

## Examples

This example shows how to boot system through the specify image in the flash:

```
bootrom:> boot_flash
```

### Related Commands

None

## 14.5.11 boot_flash_nopass

### Command Purpose

Use the boot_flash_nopass command to boot system through the specify image or default image in the flash with default configuration.

### Command Syntax

*boot_flash_nopass IMAGE_NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IMAGE_NAME | Image name in flash | - |

### Command Mode

BootRom CLI

### Default

None

### Usage

None

### Examples

This example shows how to boot system through the specify image in the flash with default configuration:

```
bootrom:> boot_flash_nopass /boot/OS-ma-v3.0.1.it.r.bin
Do you want to  revert  to the default config file ? [Y|N|E]:Y
```

### Related Commands

None

## 14.5.12 upgrade_uboot

### Command Purpose

Use the upgrade_uboot command to upgrade the U-boot image from TFTP server.

### Command Syntax

*upgrade_uboot IMAGE_NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IMAGE_NAME | Image name form tftp server | - |

### Command Mode

BootRom CLI

### Default

None

### Usage

None

### Examples

This example shows how to upgrade the Bootrom image from TFTP server:

```
bootrom:> upgrade_uboot u-boot.bin
```

### Related Commands

None

# 14.6 SmartConfig Commands

## 14.6.1 smart-config

### Command Purpose

To config smartconfig function, use the smart-config command in global configuration mode.

### Command Syntax

smart-config ( initial-switch-deployment | hostname-prefix )

no smart-config ( initial-switch-deployment | hostname-prefix )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| initial-switch-deployment | Enable initial switch automatically deployment | - |
| hostname-prefix | Enable hostname prefix feature | - |

### Command Mode

Global Configuration

### Default

Initial-switch-deployment and hostname-prefix is enabled.

### Usage

None

### Examples

The following example shows how to enable smartconfig function:

```
Switch# configure terminal
Switch(config)# smart-config initial-switch-deployment
```

The following example shows how to disable smartconfig function:

```
Switch# configure terminal
Switch(config)# no smart-config initial-switch-deployment
```

### Related Commands

ip address dhcp

show smart-config config

## 14.6.2 show smart-config config

### Command Purpose

To show configuration of smart-config, use the show smart-config configuration command in privileged EXEC mode.

### Command Syntax

show smart-config config

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following example shows how to display configuration of smart-config:

```
Switch# show smart-config config
Smart-Config config:
 initial-switch-deployment: on
 hostname-prefix: on

 Send log message to console: on
```

## Related Commands

ip address dhcp

smart-config

# 15 Network Management Commands

## 15.1 Network Diagnosis Commands

### 15.1.1 ping

#### Command Purpose

The switch supports IP ping, which you can use to test connectivity to remote hosts. Ping sends an echo request packet to an address and waits for a reply. Ping returns one of these responses:

Normal response- The normal response (hostname is alive) occurs in 1 to 10 seconds, depending on network traffic.

Destination does not respond- If the host does not respond, a no-answer message is returned.

Unknown host- If the host does not exist, an unknown host message is returned.

Destination unreachable- If the default gateway cannot reach the specified network, a destination-unreachable message is returned.

Network or host unreachable- If there is no entry in the route table for the host or network, a network or host unreachable message is return.

#### Command Syntax

ping ( ip | mgmt-if ) *WORD*

ping ( vrf *WORD* | ) [ -a *WORD* | -si *IFNAME* | -m *INTERVAL* | -c *COUNT* | -s *DATASIZE* | -f | -tos *TOS* | -h *TTL* | -t *TIMEOUT* ] *WORD*

ping ( mgmt-if | vrf *WORD* | ) ipv6 [ -a *WORD* | -m *INTERVAL* | -c *COUNT* | -s *DATASIZE* | -tc *TC* | -h *HL* | -t *TIMEOUT* ] *WORD* ( interface *IFNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| -a WORD | Select source IP address, the default is the IP address of the output interface | - |
| -si IFNAME | Set the specified interface as the source interface of ping packet | Support physical/aggregation/loopback/tunnel/vlan ports |
| ip | Public network IPv4 echo | - |
| vrf WORD | VPN Routing/Forwarding instance | Up to 31 characters |
| mgmt-if | Management interface | - |
| WORD | Ping destination IPv4 or IPv6 address or hostname | - |
| ipv6 | Public network IPv6 echo | - |
| interface | Outgoing interface for LinkLocal address/host | - |
| IFNAME | Interface's name | Support physical/aggregation/loopback/tunnel/vlan ports |
| -m INTERVAL | specify interval for sending ping packets | 10-10000 millisecond |
| -c COUNT | specify the number of ping packets | 1-4294967295 |
| -s DATASIZE | specify the data size of ping packet | 20-9600 bytes |
| -f | specify the Don't Fragment flag in packet | - |
| -tos TOS | Specify the packet tos value | 0-255 |
| -h TTL | specify the TTL value in ping packet | 1-255 |
| -tc TC | specify the Traffic Class value in ipv6 ping packet | 0-255 |
| -h HL | specify the Hop Limit value in ipv6 ping packet | 1-255 |
| -t TIMEOUT | specify the timeout value to wait for replay packet | 0-100 second,0 stands for continuous waiting |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to ping a host from management interface:

```
Switch# ping mgmt-if 10.10.29.247
PING 10.10.29.247 (10.10.29.247) 56(84) bytes of data.
64 bytes from 10.10.29.247: icmp_seq=1 ttl=64 time=0.194 ms
64 bytes from 10.10.29.247: icmp_seq=2 ttl=64 time=0.131 ms
64 bytes from 10.10.29.247: icmp_seq=3 ttl=64 time=0.134 ms
64 bytes from 10.10.29.247: icmp_seq=4 ttl=64 time=0.121 ms
64 bytes from 10.10.29.247: icmp_seq=5 ttl=64 time=0.135 ms
--- 10.10.29.247 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 3996ms
rtt min/avg/max/mdev = 0.121/0.143/0.194/0.025 ms
```

## Related Commands

traceroute

# 15.1.2 traceroute

## Command Purpose

You can use IP traceroute to identify the path that packets take through the network on a hop-by-hop basis. The command output displays all network layer (Layer 3) devices, such as routers, that the traffic passes through on the way to the destination.

Your switches can participate as the source or destination of the traceroute privileged EXEC command and might or might not appear as a hop in the traceroute command output. If the switch is the destination of the traceroute, it is displayed as the final destination in the traceroute output. Intermediate switches do not show up in the traceroute output if they are only bridging the packet from one port to another within the same VLAN. However, if the intermediate switch is a

multilayer switch that is routing a particular packet, this switch shows up as a hop in the traceroute output.

The traceroute privileged EXEC command uses the Time To Live (TTL) field in the IP header to cause routers and servers to generate specific return messages. Traceroute starts by sending a User Datagram Protocol (UDP) datagram to the destination host with the TTL field set to 1. If a router finds a TTL value of 1 or 0, it drops the datagram and sends back an Internet Control Message Protocol (ICMP) time-to-live-exceeded message to the sender. Traceroute determines the address of the first hop by examining the source address field of the ICMP time-to-live-exceeded message.

## Command Syntax

traceroute ( ip | vrf *WORD* | mgmt-if | ) *WORD*

traceroute ( vrf *WORD* | ) ipv6 *WORD*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| -a | Select source IP address, the default is the IP address of the output interface | - |
| -si | Set the specified interface as the source interface of traceroute packet | - |
| ip | Public network IPv4 echo | - |
| ipv6 | Public network IPv6 echo | - |
| vrf WORD | VPN Routing/Forwarding instance | - |
| mgmt-if | Management interface | - |
| WORD | Destination IP address or hostname | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following example is sample dialog from the traceroute command using default values:

```
Switch# traceroute 1.1.1.2
traceroute to 1.1.1.2 (1.1.1.2), 30 hops max, 38 byte packets
 1  1.1.1.2 (1.1.1.2)  108.129 ms  99.313 ms  94.720 ms
```

## Related Commands

Ping

# 15.1.3 show network connections

## Command Purpose

Use this command to view the network connectivity status of the system.

## Command Syntax

show network connections ( ipv4 | ipv6 | all ) ( tcp | udp | raw | all ) ( numeric | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ipv4 | Show IPv4 information | - |
| ipv6 | show IPv6 information | - |
| all | Show IPv4 and IPv6 information | - |
| tcp | Show TCP information | - |
| udp | Show UDP information | - |
| raw | Show raw information | - |
| all | Show TCP/UDP/raw information | - |
| numeric | Display host address and port number in numerical form | - |

## Command Mode

Privileged EXEC

## Default

none

## Usage

none

## Examples

This example displays all the connection information of the current device:

```
Switch# show network connections all all
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp        0      0 localhost:36602         localhost:705           ESTABLISHED
tcp        0      0 localhost:36620         localhost:705           ESTABLISHED
tcp        0      0 172.16.0.2:6162         172.16.0.3:33806        ESTABLISHED
tcp        0      0 localhost:36592         localhost:705           ESTABLISHED
tcp        0      0 localhost:705           localhost:36644         ESTABLISHED
tcp        0      0 localhost:36644         localhost:705           ESTABLISHED
tcp        0      0 localhost:705           localhost:36602         ESTABLISHED
tcp        0      0 localhost:705           localhost:36672         ESTABLISHED
tcp        0      0 localhost:36640         localhost:705           ESTABLISHED
tcp        0      0 localhost:705           localhost:36652         ESTABLISHED
tcp        0      0 localhost:36648         localhost:705           ESTABLISHED
tcp        0      0 172.16.0.2:6142         172.16.0.3:54560        ESTABLISHED
tcp        0      0 localhost:705           localhost:36588         ESTABLISHED
tcp        0      0 172.16.0.2:6141         172.16.0.3:47144        ESTABLISHED
tcp        0      0 localhost:705           localhost:36624         ESTABLISHED
tcp        0      0 172.16.0.2:33086        172.16.0.3:61002        ESTABLISHED
tcp        0      0 localhost:36660         localhost:705           ESTABLISHED
tcp        0      0 172.16.0.2:6163         172.16.0.3:50578        ESTABLISHED
tcp        0      0 localhost:36596         localhost:705           ESTABLISHED
tcp        0      0 localhost:705           localhost:36664         ESTABLISHED
tcp        0      0 localhost:705           localhost:36632         ESTABLISHED
tcp        0      0 localhost:36632         localhost:705           ESTABLISHED
tcp        0      0 172.16.0.2:6207         172.16.0.3:44778        ESTABLISHED
tcp        0      0 localhost:705           localhost:36592         ESTABLISHED
tcp        0      0 localhost:705           localhost:36636         ESTABLISHED
tcp        0      0 localhost:36616         localhost:705           ESTABLISHED
tcp        0      0 localhost:705           localhost:36608         ESTABLISHED
tcp        0      0 localhost:705           localhost:36668         ESTABLISHED
tcp        0      0 localhost:36668         localhost:705           ESTABLISHED
tcp        0      0 172.16.0.2:6206         172.16.0.3:34718        ESTABLISHED
tcp        0      0 localhost:36604         localhost:705           ESTABLISHED
```

```
tcp        0      0 localhost:705           localhost:36620         ESTABLISHED
tcp        0      0 localhost:705           localhost:36612         ESTABLISHED
tcp        0      0 localhost:705           localhost:36604         ESTABLISHED
tcp        0      0 localhost:705           localhost:36640         ESTABLISHED
tcp        0      0 localhost:705           localhost:36596         ESTABLISHED
tcp        0      0 localhost:705           localhost:36660         ESTABLISHED
tcp        0      0 172.16.0.2:6143         172.16.0.3:43080        ESTABLISHED
tcp        0      0 localhost:36636         localhost:705           ESTABLISHED
tcp        0      0 172.16.0.2:6140         172.16.0.3:57812        ESTABLISHED
tcp        0      0 localhost:36652         localhost:705           ESTABLISHED
tcp        0      0 172.16.0.2:6161         172.16.0.3:54938        ESTABLISHED
tcp        0      0 localhost:36588         localhost:705           ESTABLISHED
tcp        0      0 localhost:36624         localhost:705           ESTABLISHED
tcp        0      0 localhost:36628         localhost:705           ESTABLISHED
tcp        0      0 localhost:36672         localhost:705           ESTABLISHED
tcp        0      0 172.16.0.2:6160         172.16.0.3:58726        ESTABLISHED
tcp        0      0 localhost:705           localhost:36616         ESTABLISHED
tcp        0      0 localhost:705           localhost:36648         ESTABLISHED
tcp        0      0 localhost:36656         localhost:705           ESTABLISHED
tcp        0      0 localhost:36608         localhost:705           ESTABLISHED
tcp        0      0 localhost:705           localhost:36628         ESTABLISHED
tcp        0      0 localhost:36612         localhost:705           ESTABLISHED
tcp        0      0 172.16.0.2:6205         172.16.0.3:52156        ESTABLISHED
tcp        0      0 localhost:36664         localhost:705           ESTABLISHED
tcp        0      0 localhost:705           localhost:36656         ESTABLISHED
tcp        0      0 172.16.0.2:6208         172.16.0.3:60470        ESTABLISHED
```

## Related Commands

none

# 15.1.4 show network services

## Command Purpose

Use this command to view the services enabled by the system.

## Command syntax

show network services ( ipv4 | ipv6 | all ) ( tcp | udp | raw | all ) ( numeric | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ipv4 | Show IPv4 information | - |
| ipv6 | show IPv6 information | - |
| all | Show IPv4 and IPv6 information | - |
| tcp | Show TCP information | - |

| | | |
|---|---|---|
| udp | Show UDP information | - |
| raw | Show raw information | - |
| all | Show TCP/UDP/raw information | - |
| numeric | Display host address and port number in numerical form | - |

## Command Mode

Privileged EXEC

## Default

none

## Usage

none

## Example

The following example shows all the services enabled by the system:

```
Switch# show network services all all
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp        0      0 0.0.0.0:6160            0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:6161            0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:6162            0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:6163            0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:6140            0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:6141            0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:6205            0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:6142            0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:6206            0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:6143            0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:6207            0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:6208            0.0.0.0:*               LISTEN
tcp        0      0 127.0.0.1:705           0.0.0.0:*               LISTEN
tcp        0      0 127.0.0.1:8100          0.0.0.0:*               LISTEN
tcp        0      0 127.0.0.1:199           0.0.0.0:*               LISTEN
tcp        0      0 :::22                   :::*                    LISTEN
tcp        0      0 :::22                   :::*                    LISTEN
tcp        0      0 :::23                   :::*                    LISTEN
tcp        0      0 :::23                   :::*                    LISTEN
tcp        0      0 :::23                   :::*                    LISTEN
tcp        0      0 :::61002                :::*                    LISTEN
```

```
udp        0      0 10.13.13.107:123        0.0.0.0:*
udp        0      0 127.0.0.1:123           0.0.0.0:*
udp        0      0 0.0.0.0:123             0.0.0.0:*
udp        0      0 0.0.0.0:3503            0.0.0.0:*
udp        0      0 0.0.0.0:514             0.0.0.0:*
udp        0      0 0.0.0.0:3785            0.0.0.0:*
udp        0      0 0.0.0.0:67              0.0.0.0:*
udp        0      0 0.0.0.0:68              0.0.0.0:*
udp        0      0 fe80::21e:8ff:fe27::123 :::*
udp        0      0 ::1:123                 :::*
udp        0      0 :::123                  :::*
raw        0      0 0.0.0.0:1               0.0.0.0:*               7
raw        0      0 0.0.0.0:2               0.0.0.0:*               7
raw   1000000      0 255.255.255.255:17      0.0.0.0:*               7

raw   1000000      0 255.255.255.255:17      0.0.0.0:*               7

raw   1000000      0 255.255.255.255:17      0.0.0.0:*               7

raw        0      0 0.0.0.0:103             0.0.0.0:*               7
raw        0      0 0.0.0.0:103             0.0.0.0:*               7
raw        0      0 0.0.0.0:255             0.0.0.0:*               7
raw        0      0 :::58                   :::*                    7
raw        0      0 :::89                   :::*                    7
raw        0      0 :::103                  :::*                    7
raw        0      0 :::103                  :::*                    7
```

## Related Commands

none

# 15.1.5 show network statistics

## Command Purpose

Use this command to view system statistics results.

## Command Syntax

show network statistics ( tcp | udp | raw | all )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| tcp | Show TCP information | - |
| udp | Show UDP information | - |
| raw | Show raw information | - |
| all | Show TCP/UDP/raw information | - |

## Command Mode

Privileged EXEC

## Default

none

## Usage

none

## Example

The following example shows the statistical results of the system:

```
Switch# show network statistics all
Ip:
    2308686 total packets received
    0 forwarded
    0 incoming packets discarded
    2269596 incoming packets delivered
    3978161 requests sent out
Icmp:
    8 ICMP messages received
    0 input ICMP message failed.
    InCsumErrors: 0
    ICMP input histogram:
        destination unreachable: 8
    8 ICMP messages sent
    0 ICMP messages failed
    ICMP output histogram:
        destination unreachable: 8
IcmpMsg:
        InType3: 8
        OutType3: 8
Tcp:
    47 active connections openings
    46 passive connection openings
    22 failed connection attempts
    12 connection resets received
    57 connections established
    2259727 segments received
    2341577 segments send out
    62 segments retransmited
    0 bad segments received.
    35 resets sent
    InCsumErrors: 0
Udp:
    6049 packets received
```

```
8 packets to unknown port received.
0 packet receive errors
8 packets sent
RcvbufErrors: 0
SndbufErrors: 0
InCsumErrors: 0
IgnoredMulti: 3848
```

### Related Commands

none

## 15.2 NTP Commands

### 15.2.1 ntp ace

#### Command Purpose

To create the Access Control Entries (ACE) of a NTP server/peer, use the ntp ace command in global configuration mode. To remove the ace, use the no form of this command.

#### Command Syntax

ntp ace ( *IP_ADDR* | *HOSTNAME* ) ( mask *MASK_LENGTH* | ) ( version | kod | ignore | noquery | nomodify | notrap | noserve | nopeer | notrust | limited | none )

no ntp ace ( *IP_ADDR* | *HOSTNAME* ) ( mask *MASK* | ) ( version | kod | ignore | noquery | nomodify | notrap | noserve | nopeer | notrust | limited | none )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IP_ADDR | IP address of the time server or peer | IPv4 Address , exclude 127.0.0.1 & 0.0.0.0 |
| HOSTNAME | Name of the time server or peer | Up to 256 characters |
| MASK_LENGTH | Specify network mask length of the address | 1-32 |
| MASK | Specify network mask of the address | In IPv4 Address format |
| version | Ignore these hosts if not the current NTP version | - |

| | | |
|---|---|---|
| kod | If access is denied, send a kiss-of-death packet | - |
| ignore | Ignore all packets from host that match this entry | - |
| noquery | Ignore all NTP mode 6 and 7 packets from the source, time service is not affected | - |
| nomodify | Ignore all NTP mode 6 and 7 packets which attempt to modify the state of the server | - |
| notrap | Decline to provide mode 6 control message trap service to matching hosts | - |
| noserve | Ignore NTP packets whose mode is other than 6 or 7 | - |
| nopeer | Provide stateless time service to polling hosts, but do not allocate peer memory resources | - |
| notrust | Treat these hosts normally in other respects, but never use them as synchronization sources | - |
| limited | These hosts are subject to limitation of number of clients from the same net | - |
| none | No limit | - |

## Command Mode

Global Configuration

## Default

None

## Usage

Use this command if you want to allow the system to synchronize with the specified server. The server will not synchronize to this machine.

### Examples

The following example shows how to create an ACE for 1.1.1.1:

```
Switch# configure terminal
Switch(config)# ntp ace 1.1.1.1 version
```

### Related Commands

show ntp

## 15.2.2 ntp authentication

### Command Purpose

To enable NTP authentication, use the ntp authentication enable command. To disable the NTP authentication, use the ntp authentication disable command.

### Command Syntax

ntp authentication ( enable | disable )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| enable | Enable NTP authentication | - |
| disable | Disable NTP authentication | - |

### Command Mode

Global Configuration

### Default

None

### Usage

When NTP authentication is enabled, the switch will synchronize the time with NTP servers with trusted key only. For more information about trusted key, please see the ntp trustedkey command.

### Examples

The following example shows how to enables NTP authentication:

```
Switch# configure terminal
Switch(config)# ntp authentication enable
```

### Related Commands

show ntp

## 15.2.3 ntp disable

### Command Purpose

To configure Disable NTP packets from being received on the interface, use the ntp disable command in interface configuration mode. To disable this capability, use the no form of this command.

### Command Syntax

ntp disable

no ntp disable

### Command Mode

Interface Configuration

### Default

By default, all interfaces receive NTP packets.

### Usage

Only physical interface, vlan interface and loopback interface support this command.

## Examples

In the following example, the system is configured not to receive NTP packet in interface eth-0-1:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ntp disable
```

## Related Commands

None

# 15.2.4 ntp key

## Command Purpose

To configure value of the NTP key, use the ntp key command in global configuration mode. To remove the value of the NTP key, use the no form of this command.

## Command Syntax

ntp key *KEYID* ( 8 | ) *VALUE*

no ntp key *KEYID*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| KEYID | Authentication key | 1-64000 |
| 8 | Specify hidden key | - |
| VALUE | The value of the key | Up to 128 characters |

## Command Mode

Global Configuration

## Default

None

## Usage

Use this command to create a value for a NTP key.

## Examples

In the following example, the value 321 is given to the NTP key 123:

```
Switch# configure terminal
Switch(config)# ntp key 123 321
```

## Related Commands

show ntp

# 15.2.5 ntp interface reload

## Command Purpose

To reload the NTP configuration on the interfaces, use the ntp interface reload command in global configuration mode.

## Command Syntax

ntp interface reload

## Command Mode

Global Configuration

## Default

None

## Usage

Use this command to reload the NTP configuration on all the interfaces.

## Examples

The following example reloads the NTP configuration on all interfaces:

```
Switch# configure terminal
Switch(config)# ntp interface reload
```

### Related Commands

show ntp

## 15.2.6 ntp max-distance

### Command Purpose

Use ntp max-distance command to config ntp max sync distance threshold. This command used in ntp client, and ntp calculate the sync distance to each ntp server and compare it with the ntp max sync distance which configured by ntp max-distance command. If the distance calculate by ntp over the distance configured by ntp max-distance, client will not sync with this ntp server.

### Command Syntax

ntp max-distance *DISTANCE*

no ntp max-distance *DISTANCE*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DISTANCE | Specify the ntp max sync distance threshold in seconds, default 10s. | 1-16 |

### Command Mode

Global Configuration

### Default

10

### Usage

None

### Examples

The following example shows the configuration of NTP:

```
Switch# configure terminal
DUT1# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
DUT1(config)# ntp max-distance 16
```

### Related Commands

None

## 15.2.7 ntp peer

### Command Purpose

To configure the software clock to synchronize a peer or to be synchronized by a peer, use the ntp peer command in global configuration mode. To disable this capability, use the no form of this command.

### Command Syntax

ntp peer( *HOSTNAME* | *IP_ADDR* ) { key *KEY_ID* | prefer | version *VER* } { source-interface *IFNAME* | source-ip *SRC_ADDR* }

no ntp peer( *HOSTNAME* | *IP_ADDR* )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| HOSTNAME | Name of the time server or peer | Up to 256 characters |
| IP_ADDR | IP address of the time server or peer | IPv4 Address |
| KEY_ID | Authentication key to use when sending packets to this peer | 1-64000 |
| prefer | Makes this peer the preferred peer that provides synchronization | - |
| VER | Defines the Network Time Protocol (NTP) version number | 1-3 |
| IFNAME | Name of source interface | Support physical/aggregation/loopback/tunnel/vlan ports |
| SRC_ADDR | Source IP address | IPv4 Address |

## Command Mode

Global Configuration

## Default

None

## Usage

When a peer is configured, the default NTP version number is 3, no authentication key is used, and the source IP address is taken from the outgoing interface.

Use this command to allow a device to synchronize with a peer, or vice versa. Using the prefer keyword reduces switching between peers.

If the source interface or source IP address is specified, the packet transmit will use the related IP address as source address.

## Examples

The following example shows how to configure a switch to allow its software clock to be synchronized with the clock of the peer (or vice versa) at IP address 192.168.22.33 using NTP version 2.:

```
Switch# configure terminal
Switch(config)# ntp peer 192.168.22.33 version 2
```

## Related Commands

show ntp

# 15.2.8 ntp refclock

## Command Purpose

To configure an external clock source for use with Network Time Protocol (NTP) services, use the ntp refclock command in global configuration mode. To disable support of the external time source, use the no form of this command.

## Command Syntax

ntp refclock stratum *NUMBER*

no ntp refclock

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NUMBER | Indicates the NTP stratum number that the system will claim. | 1-15 |

## Command Mode

Global Configuration

## Default

This command is disabled by default.

## Usage

None

## Examples

The following example shows configuration of a NTP source on a switch platform:

```
Switch# configure terminal
Switch(config)# ntp refclock stratum 1
```

## Related Commands

show ntp

# 15.2.9 ntp server

## Command Purpose

To allow the software clock to be synchronized by a Network Time Protocol (NTP) time server, use the ntp server command in global configuration mode. To disable this capability, use the no form of this command.

## Command Syntax

ntp server ( mgmt-if | vrf *NAME* | ) ( *HOSTNAME* | *IP_ADDR* ) { key *KEY_ID* | prefer | version *VER* } { source-interface *IFNAME* | source-ip *SRC_ADDR* }

no ntp server ( mgmt-if | vrf *NAME* | ) ( *HOSTNAME* | *SRC_ADDR* )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| mgmt-if | use the management port | - |
| vrf NAME | specify the name of the VPN instance | Up to 32 characters |
| HOSTNAME | Name of the time server or peer | Up to 256 characters |
| IP_ADDR | IP address of the time server or peer | IPv4 Address |
| KEY_ID | Authentication key to use when sending packets to this peer | 1-64000 |
| prefer | Makes this peer the preferred peer that provides synchronization | - |
| VER | Defines the Network Time Protocol (NTP) version number | 1-3 |
| IFNAME | Name of source interface | Support physical/aggregation/loopback/tunnel/vlan ports |
| SRC_ADDR | Source IP address | IPv4 Address |

## Command Mode

Global Configuration

## Default

The server will not synchronize to this machine.

## Usage

Use this command if you want to allow the system to synchronize with the specified server.

If the source interface or source IP address is specified, the packet transmit will use the related IP address as source address.

## Examples

The following example shows how to configure a switch to allow its software clock to be synchronized with the clock by the device at IP address 172.16.22.44 using NTP version 2:

```
Switch# configure terminal
Switch(config)# ntp server 172.16.22.44 version 2
```

## Related Commands

show ntp

# 15.2.10 ntp trustedkey

## Command Purpose

To authenticate the identity of a system to which Network Time Protocol (NTP) will synchronize, use the ntp trustedkey command in global configuration mode. To disable authentication of the identity of the system, use the no form of this command.

## Command Syntax

ntp trustedkey *KEY_ID*

no ntp trustedkey *KEY_ID*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| KEY_ID | Authentication key to use when sending packets to this peer | 1-64000 |

## Command Mode

Global Configuration

## Default

None

### Usage

If authentication is enabled, use this command to define one or more key numbers (corresponding to the keys defined with the ntp key command) that a peer NTP system must provide in its NTP packets, in order for this system to synchronize to it. This function provides protection against accidentally synchronizing the system to a system that is not trusted, because the other system must know the correct authentication key.

### Examples

The following example shows how to configure the system to synchronize only to systems providing authentication key 42 in its NTP packets:

```
Switch# configure terminal
Switch(config)# ntp authentication enable
Switch(config)# ntp key 42 aNiceKey
Switch(config)# ntp trustedkey 42
```

### Related Commands

show ntp

ntp key

## 15.2.11 show ntp

### Command Purpose

To display the NTP configurations, use the show ntp command in privileged EXEC mode.

### Command Syntax

show ntp

### Command Mode

Privileged EXEC

## Default

None

## Usage

Use this command to display the NTP configurations.

## Examples

The following example shows the configuration of NTP:

```
Switch# show ntp
Current NTP configuration:
============================================================
NTP access control list:
Unicast peer:
  1.1.1.1
Unicast server:
  2.2.2.2
Authentication: enabled
Local reference clock:
  enabled, stratum 10
```

## Related Commands

ntp server

ntp peer

# 15.2.12 show ntp ace

## Command Purpose

To display the restrict list of Access Control Entries (ACE) of a NTP server/peer, use the show ntp ace command in privileged EXEC mode.

## Command Syntax

show ntp ace

## Command Mode

Privileged EXEC

## Default

None

## Usage

None.

## Examples

The following example shows the NTP restrict list:

```
Switch# show ntp ace
address          mask            count        flags
================================================================================
0.0.0.0          0.0.0.0           55188       noquery, nomodify, notrap
6.6.6.6          255.255.255.255   73          none
127.0.0.1        255.255.255.255   1259        none
```

## Related Commands

ntp ace

# 15.2.13 show ntp associations

## Command Purpose

To show the status of Network Time Protocol (NTP) associations, use the show ntp associations command in privileged EXEC mode.

## Command Syntax

show ntp associations

## Command Mode

Privileged EXEC

## Default

None

### Usage

Detailed descriptions of the information displayed by this command can be found in the NTP specification (RFC 1305).

### Examples

The following example shows the status of NTP associations:

```
Switch# show ntp associations
Current NTP associations:
     remote           refid      st when poll reach   delay   offset  disp
==============================================================================
*6.6.6.6         127.127.1.0      6  161  256  377    0.778   -0.087 119.400
* synchronized, + candidate, # selected, x falsetick, . excess, - outlyer
```

### Related Commands

show ntp status

## 15.2.14 show ntp key

### Command Purpose

To show the NTP keys, use the show ntp key command in privileged EXEC mode.

### Command Syntax

show ntp key

### Command Mode

Privileged EXEC

### Default

None

### Usage

Use this command to display the NTP keys.

### Examples

The following example shows the keys of NTP:

```
Switch# show ntp key
Current NTP key configuration:
Flags: * - Trusted
  ID     Value
============================================================
* 1      trusted key
  5      test_key
```

### Related Commands

ntp key

## 15.2.15 show ntp status

### Command Purpose

To show the status of the Network Time Protocol (NTP), use the show ntp status command in privileged EXEC mode.

### Command Syntax

show ntp status

### Command Mode

Privileged EXEC

### Default

None

### Usage

None.

### Examples

The following is sample output from the show ntp status command:

```
Switch# show ntp status
Current NTP status:
============================================================
clock is synchronized
stratum:         11
reference clock: 127.127.1.0
frequency:       0.000 ppm
precision:       2^15
reference time:  d116c946.4dc2f6a7  ( 1:24:22.303 UTC Tue Mar  1 2011)
root delay:      0.000 ms
root dispersion: 449.207 ms
peer dispersion: 662.059 ms
clock offset:    0.000 ms
stability:       0.000 ppm
```

### Related Commands

show ntp associations

## 15.2.16 show ntp statistics

### Command Purpose

To show the statistics of the Network Time Protocol (NTP), use the show ntp statistics command in privileged EXEC mode.

### Command Syntax

show ntp statistics

### Command Mode

Privileged EXEC

### Default

None

### Usage

None.

### Examples

The following is sample output from the show ntp statistics command:

```
Switch# show ntp statistics
Current NTP I/O statistics:
============================================================
time since reset:     175834
receive buffers:      10
free receive buffers: 9
used receive buffers: 0
low water refills:    1
dropped packets:      0
ignored packets:      0
received packets:     32
packets sent:         31
packets not sent:     0
interrupts handled:   32
received by int:      32
```

### Related Commands

show ntp associations

## 15.2.17 clear ntp statistics

### Command Purpose

To clear the statistics of the Network Time Protocol (NTP), use the clear ntp statistics command in privileged EXEC mode.

### Command Syntax

clear ntp statistics

### Command Mode

Privileged EXEC

### Default

None

## Usage

None.

## Examples

The following is a sample to clear ntp statistics:

```
Switch# clear ntp statistics
```

## Related Commands

show ntp statistics

# 15.2.18 ntp mgmt-if

## Command Purpose

To enable NTP management interface, use the ntp mgmt-if command. To enable management interface only, use the only parameter. To enable both in-band and management interface, use the enable parameter. To disable NTP management interface, use the no ntp mgmt-if command.

## Command Syntax

ntp mgmt-if ( enable | only )

no ntp mgmt-if

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| only | Only use management interface | - |
| enable | Both use management interface and in-band interface | - |

### Command Mode

Global Configuration

### Default

Disable management interface by default and only use in-band interface

### Usage

Use this command to enable management interface, then the ntp client will connect to the server or peer.

### Examples

The following example shows only use management interface:

```
Switch# configure terminal
Switch(config)# ntp mgmt-if only
```

### Related Commands

show ntp

ntp mgmt-if broadcast

## 15.3 PTP Commands

### 15.3.1 ptp device-type

### Command Purpose

Use this command to set the clock type.

### Command Syntax

ptp device-type ( bc | oc | e2etc | p2ptc )

no ptp device-type

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| bc | boundary clock | - |
| oc | ordinary clock | - |
| e2etc | end-to-end transparent clock | - |
| p2ptc | peer-to-peer transparent clock | - |

## Command Mode

Global Configuration

## Default

By default, the device type is ordinary clock.

## Usage

N/A

## Examples

The following example set the clock type to boundary clock

```
Switch# configure terminal
Switch(config)# ptp device-type bc
```

## Related Commands

None

# 15.3.2 ptp start

## Command Purpose

Use this command to set the clock enable globally.

## Command Syntax

ptp start

ptp stop

## Command Mode

Global Configuration

### Default

By default, PTP is disabled on device.

### Usage

None

### Examples

The following example set the clock enable PTP

```
Switch# configure terminal
Switch(config)# ptp start
```

### Related Commands

None

## 15.3.3 ptp clock-step

### Command Purpose

Use this command to set the clock mode is one-step or two-step

### Command Syntax

ptp clock-step ( one-step | two-step )

no ptp clock-step

### Command Mode

Global Configuration

### Default

By default, the clock mode is two-step

### Usage

None

### Examples

The following example set the clock mode to one-step

```
Switch# configure terminal
Switch(config)# ptp clock-step one-step
```

### Related Commands

None

## 15.3.4 ptp domain

### Command Purpose

Use this command to set the domain of the ordinary clock or boundary clock.

### Command Syntax

ptp domain *DOMAIN*

no ptp domain

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DOMAIN | the domain number | 0-127 |

### Command Mode

Global Configuration

### Default

By default, the domain is 0.

### Usage

None

### Examples

The following example set the domain to 1

```
Switch# configure terminal
Switch(config)# ptp domain 1
```

### Related Commands

ptp device-type

## 15.3.5 ptp priority1

### Command Purpose

Use this command to set the priority1 of the ordinary clock or boundary clock.

## Command Syntax

ptp priority1 *PRIORITY*

no ptp priority1

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PRIORITY | the value of the priority1 | 0-255 |

## Command Mode

Global Configuration

## Default

By default, the value of the priority1 is 128.

## Usage

None

## Examples

The following example set the priority1 to 0

```
Switch# configure terminal
Switch(config)# ptp priority1 0
```

## Related Commands

ptp device-type

# 15.3.6 ptp priority2

## Command Purpose

Use this command to set the priority2 of the ordinary clock or boundary clock.

## Command Syntax

ptp priority2 *PRIORITY*

no ptp priority2

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PRIORITY | the value of the priority2 | 0-255 |

## Command Mode

Global Configuration

## Default

By default, the value of the priority2 is 128.

## Usage

None

## Examples

The following example set the priority2 to 0

```
Switch# configure terminal
Switch(config)# ptp priority2 0
```

## Related Commands

ptp device-type

# 15.3.7 ptp announce-interval

## Command Purpose

Use this command to set the announce interval of the interface on ordinary clock or boundary clock.

## Command Syntax

ptp announce-interval *INTERVAL*

no ptp announce-interval

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INTERVAL | the interval of send announce packet, the value is 2 to the power of interval | -5-10 |

## Command Mode

Interface Configuration

## Default

By default, the value of announce interval is 1, that is, 2 second.

## Usage

None

## Examples

The following example set the announce interval of the interface to 1024 second

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ptp announce-interval 10
```

## Related Commands

None

# 15.3.8 ptp sync-interval

## Command Purpose

Use this command to set the sync interval of the interface on ordinary clock or boundary clock.

## Command Syntax

ptp sync-interval *INTERVAL*

no ptp sync-interval

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INTERVAL | the interval of send sync packet, the value is 2 to the power of interval | -5-10 |

## Command Mode

Interface Configuration

## Default

By default, the value of sync interval is 0, that is, 1 second.

## Usage

None

## Examples

The following example set the sync interval of the interface to 1024 second

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ptp sync-interval 10
```

## Related Commands

None

# 15.3.9 ptp delay-mechanism

## Command Purpose

Use this command to set the delay mechanism of the interface on clock.

## Command Syntax

ptp delay-mechanism ( e2e | p2p )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| e2e | use the req-resp delay measurement mechanism | - |
| p2p | use a node delay measurement mechanism | - |

## Command Mode

Global Configuration

## Default

By default, the value of delay mechanism is normal.

## Usage

None

## Examples

The following example set the delay mechanism to p2p

```
Switch# configure terminal
Switch(config)# ptp delay-mechanism p2p
```

## Related Commands

None

## 15.3.10 ptp announce-receipt-timeout

### Command Purpose

Use this command to set the announce-receipt-timeout times of the interface on ordinary clock or boundary clock.

### Command Syntax

ptp announce-receipt-timeout *TIMES*

no announce-receipt-timeout

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| TIMES | the time out times of the announce receipt | 3-255 |

### Command Mode

Interface Configuration

### Default

By default, the value of announce-receipt-timeout is 4.

### Usage

None

### Examples

The following example set the announce-receipt-timeout times of the interface to 3

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ptp announce-receipt-timeout 3
```

### Related Commands

None

## 15.3.11 ptp enable

### Command Purpose

Use this command to set PTP enable on the interface of clock.

## Command Syntax

ptp enable

ptp disable

## Command Mode

Interface Configuration

## Default

By default, PTP is disabled on interface.

## Usage

None

## Examples

The following example set the interface enable PTP

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ptp enable
```

## Related Commands

None

# 15.3.12 ptp protocol

## Command Purpose

Use this command to set the protocol type of interface on clock.Choose to use Ethernet or UDP protocol for transmission.

## Command Syntax

ptp network-tansport ( ether | udp )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ether | ether type | - |
| udp | udp ipv4 type | - |

## Command Mode

Global Configuration

## Default

By default, each interface is over ethernet protocol with multicast MAC address specified by IEEE Std 1588-2008.

## Usage

None

## Examples

The following example set the interface use UDP protocol

```
Switch# configure terminal
Switch(config)# ptp network-tansport udp
```

## Related Commands

ptp udp-ipaddr

# 15.3.13 ptp udp-ipaddr

## Command Purpose

Use this command to configure the source IP address for PTP message . It takes effect when the ptp network-tansport is udp.

## Command Syntax

ptp udp-ipaddr A.B.C.D

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| A.B.C.D | IP address in A.B.C.D format | - |

## Command Mode

Global Configuration

## Default

None.

## Usage

Use this command to configure the source IP address for PTP message.

### Examples

The following example set the source IP address “10.0.0.10” for PTP message:

```
Switch# configure terminal
Switch(config)# ptp udp-ipaddr 10.0.0.10
```

### Related Commands

None

## 15.3.14 ptp slave-only

### Command Purpose

Use this command to configure the PTP of the switch as a slave only and not participate in the master election.

### Command Syntax

ptp slave-only

### Command Mode

Global Configuration

### Default

Disable slave-only

### Usage

Configure the switch as PTP slave-only.

### Examples

Configure the switch as slave-only.

```
Switch(config)# ptp slave-only
Switch(config)#
```

## Related Commands

None

# 15.3.15 ptp minor-version

## Command Purpose

Use this command to configure the value of the minor version field encapsulated in the PTP of the switch when sending protocol messages. Use the 'no' form of this command to delete the configuration and restore it to its default value.

## Command Syntax

ptp minor-version*NUM*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| *NUM* | Minor-version number | <0-9> |

## Command Mode

Global Configuration

## Default

1

## Usage

Configure the PTP minor version number of the switch, default to 1, which is version 2.1.

## Examples

Configure the PTP minor version number of the switch to 0

```
Switch(config)# ptp minor-version 0
Switch(config)#
```

## Related Commands

None

# 15.3.16 show ptp

## Command Purpose

Use this command to show the global information of PTP.

## Command Syntax

show ptp

## Command Mode

Privileged EXEC

## Default

None

## Usage

This command displays the global information of PTP.

## Examples

The following example shows the global state of PTP

```
Switch# show ptp
------------------  Global Config  ------------------
PTP State                   : enable
Port Number                 : 1
Domain                      : 0
Step Mode                   : two
Priotity1                   : 128
Priotity2                   : 128
Clock Type                  : ordinary clock
Delay Machanism             : E2E
------------------  Time Status  -------------------
        d85b22.fffe.000423-0 seq 0 RESPONSE MANAGEMENT TIME_STATUS_NP
master_offset(ns)           1
ingress_time(ns)            1721364917065442592
gmPresent                   true
gmIdentity                  000102.fffe.030606
Switch#
```

## Related Commands

None

# 15.3.17 show ptp interface

## Command Purpose

Use this command to show the interface information of PTP.

## Command Syntax

show ptp interface ( statistics )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| statistics | PTP protocol message sending and receiving statistics. | |

## Command Mode

Privileged EXEC

## Default

None

## Usage

This command displays the interface information of PTP.

## Examples

The following example shows the interface state of PTP

```
Switch# show ptp interface
        d85b22.fffe.0bba84-29 seq 0 RESPONSE MANAGEMENT PORT_DATA_SET
portIdentity            d85b22.fffe.0bba84-29
portState               SLAVE
logMinDelayReqInterval  0
peerMeanPathDelay       0
logAnnounceInterval     1
announceReceiptTimeout  3
logSyncInterval         0
delayMechanism          1
logMinPdelayReqInterval 0
versionNumber           2
        d85b22.fffe.0bba84-10 seq 0 RESPONSE MANAGEMENT PORT_DATA_SET
portIdentity            d85b22.fffe.0bba84-10
portState               MASTER
```

```
logMinDelayReqInterval  0
peerMeanPathDelay       0
logAnnounceInterval     1
announceReceiptTimeout  3
logSyncInterval         0
delayMechanism          1
logMinPdelayReqInterval 0
versionNumber           2
Switch#
```

### Related Commands

None

## 15.4 Phy Loopback Commands

### 15.4.1 loopback phy

#### Command Purpose

Use this command to configure a physical interface as phy level loopback mode. Use the no loopback command to cancel this configuration.

#### Command Syntax

loopback phy ( internal *IFPHYSICAL* | external )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| internal IFPHYSICAL | Packets transmitted to the interface should be looped back to a specified physical interface without any modification. The destination physical interface | - |
| external | Packets received from the interface should be looped back to the interface itself without any modification | - |

#### Command Mode

Interface Configuration

## Default

None

## Usage

Only one type of loopback can be applied on a physical interface. A new configuration should replace the old configuration.

## Examples

In the following example, the physical interface is set to phy level loopback mode:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# loopback phy internal eth-0-2
```

## Related Commands

no loopback

# 15.4.2 loopback port

## Command Purpose

Use this command to configure a physical interface as port level loopback mode. Use the no loopback command to cancel this configuration.

## Command Syntax

loopback port ( mac-address swap | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| mac-address swap | If this flied is entered, the packet's SMAC incoming from port level loopback interface will be swapped with its DMAC, and the FCS will be updated | - |

## Command Mode

Interface Configuration

### Default

None

### Usage

Only one type of loopback can be applied on a physical interface. A new configuration should replace the old configuration.

### Examples

In the following example, the physical interface is set to port level loopback mode:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# loopback port
```

### Related Commands

no loopback

## 15.4.3 no loopback

### Command Purpose

Use this command to cancel a physical interface from phy level or port level loopback to normal interface.

### Command Syntax

no loopback

### Command Mode

Interface Configuration

### Default

None

### Usage

Phy or port level loopback can be cancelled by this command.

### Examples

In the following example, port level loopback is cancelled by this command:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# loopback port
Switch(config-if)# no loopback
```

### Related Commands

loopback phy

loopback port

## 15.4.4 show phy loopback

### Command Purpose

Use this command to show the configuration of phy loopback.

### Command Syntax

show phy loopback

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

## Examples

In the following example shows how to show the configuration:

```
Switch# show phy loopback
Interface    Type        DestIntf     SwapMac
 ------------------------------------------------------------
 eth-0-1     port        -           no
 eth-0-2     port        -           yes
 eth-0-3     external    -            -
 eth-0-4     internal    eth-0-5      -
 ------------------------------------------------------------
```

## Related Commands

loopback phy

loopback port

# 15.4.5 l2 ping

## Command Purpose

Use this command to ping specified DMAC from specified physical interface, using protocol packet with ethertype 0x9009.

## Command Syntax

l2 ping *HHHH.HHHH.HHHH* interface *IFPHYSICAL* ( { vlan *VLAN_ID* | interval *INTERVAL* | timeout *TIMEOUT* | count *COUNT* | size *SIZE* } | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| HHHH.HHHH.HHHH | The DMAC to ping | MAC Address in HHHH.HHHH.HHHH format |
| interface IFPHYSICAL | The interface to ping from | Support physical ports |
| VLAN_ID | The vlan id of the protocol ping packet | 1-4094 |
| INTERVAL | The interval time between two ping action, second | 1-65535 |
| TIMEOUT | The time wait for a ping action, second | 1-65535 |
| COUNT | Total ping times | 1-65535 |
| SIZE | The size of the protocol ping packet | 64-1518 |

### Command Mode

Privileged EXEC

### Default

The ping protocol packet is without vlan tag by default.

The default interval ping time is 200 milliseconds.

The default count is 5.

The default size of the ping protocol packet is 64.

### Usage

The ping action can be canceled by “Ctrl + C”.

### Examples

The following example shows how to ping a specified destination mac.:

```
Switch# l2 ping 0000.0000.0001 interface eth-0-1 vlan 101 interval 200 timeout 1000
count 10 size 1500
```

### Related Commands

l2 ping response

## 15.4.6 l2 ping stop

### Command Purpose

Use this command to stop l2 ping.

### Command Syntax

l2 ping stop

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

In the following example shows how to stop L2 ping:

```
Switch# l2 ping stop
```

### Related Commands

None

## 15.4.7 l2 ping forward enable

### Command Purpose

Use this command to forward l2 ping packets. Otherwise, packets are discarded.

### Command Syntax

l2 ping forward enable

no l2 ping forward enable

### Command Mode

Interface Configuration

### Default

Enable

### Usage

None

### Examples

In the following example shows how to enable l2 ping forward on interface:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)#  l2 ping forward enable
```

### Related Commands

None

## 15.4.8 l2 ping response

### Command Purpose

Use this command to enable l2 ping response globally. Use the no form of this command to disable it.

### Command Syntax

l2 ping response enable

no l2 ping response enable

### Command Mode

Interface Configuration

### Default

None

### Usage

If l2 ping response is not enabled, the l2 ping request packet should be dropped.

### Examples

In the following example shows how to enable l2 ping response on interface:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# l2 ping response enable
```

### Related Commands

l2 ping

show l2ping response

## 15.4.9 show l2ping response

### Command Purpose

Use this command to show the configuration of l2 ping.

### Command Syntax

show l2ping response

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

In the following example shows how to use this command:

```
Switch# show l2 ping response
Interface       L2pingResp
 -------------------------------------
 eth-0-7       Enable
 eth-0-8       Enable
 -------------------------------------
```

### Related Commands

l2 ping response

## 15.4.10 show l2ping state

### Command Purpose

Use this command to show the state of l2 ping.

### Command Syntax

show l2ping state

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

In the following example shows the status of l2ping:

```
Switch# show l2ping response
L2 ping state.
 ---------------------------------------------------------------
 Total count  Interval  Timeout  VlanId  Packet size  Sequence
 100 1515010
 10 packet(s) transmitted, 0 received, 100 % packet loss
```

### Related Commands

None

# 15.4.11 debug l2ping

## Command Purpose

Use this command to enable debugging l2 ping.

## Command Syntax

debug l2ping ( all | packet | send | receive | response )

no debug l2ping ( all | packet | send | receive | response )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| all | All l2ping debug | - |
| packet | Packet | - |
| send | Send packets | - |
| receive | Receive packets | - |
| response | Response Log | - |

## Command Mode

Privileged EXEC

## Default

All these three debugging types is off.

## Usage

If packet, send, or receive debugging is on, the corresponding message will be printed.

## Examples

In the following example shows how to use this command:

```
Switch# debug l2ping all
```

## Related Commands

l2 ping response

# 15.4.12 show debugging l2ping

## Command Purpose

Use this command to show the status of l2ping debugging

## Command Syntax

show debugging l2ping

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

In the following example shows the status of l2ping debugging:

```
Switch# show debugging l2ping
L2ping debugging status:
  l2ping packet debugging is on
  l2ping receive debugging is on
  l2ping send debugging is on
  l2ping response debugging is on
```

## Related Commands

l2 ping response

# 15.5 RMON Commands

## 15.5.1 rmon collection stats

### Command Purpose

Use this command to enable RMON statistic collection on the interface

### Command Syntax

rmon collection stats *ID* ( owner *OWNER* | )

no rmon collection stats *ID*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ID | Specify the RMON group of statistics | 1-65535 |
| owner OWNER | The owner identity of the statistic.(optional) | Up to 15 characters |

### Command Mode

Interface Configuration

### Default

None

### Usage

To create one statistic only on a certain interface

### Examples

This example shows how to collect RMON statistics for the owner test:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# rmon collection stats 1 owner test
```

## Related Commands

show rmon statistics

# 15.5.2 rmon collection history

## Command Purpose

Use this command to enable RMON history collection for the specified number of buckets and time period

## Command Syntax

rmon collection history *INDEX* ( buckets *NUMBER* | ) ( interval *INTERVAL* | ) ( owner *OWNER* | )

no rmon collection history *INDEX*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INDEX | Specify the maximum number of buckets desired for the RMON<br>Specify the maximum number of buckets desired for the RMON<br>Collection history group of statistics. | 1-65535 |
| buckets NUMBER | Specify the maximum number of buckets desired for the RMON collection history group of statistics. | 1-65535 |
| interval INTERVAL | Specify the number of seconds in each polling cycle. | 1-3600 |
| owner OWNER | The owner identity of history group (optional) | Up to 15 characters |

## Command Mode

Interface Configuration

## Default

None

## Usage

Use this command to enable a history statistics on a certain interface.

## Examples

This example shows how to enable history RMON statistics on eth-0-1:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# rmon collection history 1 buckets 1000 interval 100 owner test
```

## Related Commands

show rmon history

# 15.5.3 rmon event

## Command Purpose

Use this command to add an event to RMON event table

## Command Syntax

rmon event *INDEX* ( log | ) ( trap *TRAP* | ) ( description *DESCRIPTION* | ) ( owner *OWNER* | )

no rmon event *Index*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INDEX | Event index. | 1-65535 |
| log | Generate a RMON log when event is triggered | - |
| trap TRAP | Trap community | Up to 127 characters |
| description DESCRIPTION | Specify the description string for the event (default is Specify the description string for the event (default is RMON_SNMP) | Up to 127 characters |
| owner OWNER | The owner name (default is RMON_SNMP) | Up to 15 characters |

## Command Mode

Global Configuration

## Default

None

## Usage

Create an event is for RMON alarm. Permit event special triggered operate. Log can be sent by trap.

## Examples

This example shows how to create an event:

```
Switch# configure terminal
Switch(config)# rmon event 1 log trap public description reach_max owner test
```

## Related Commands

show rmon event

# 15.5.4 rmon alarm

## Command Purpose

Use this command to set an alarm on a MIB object.

## Command Syntax

rmon alarm *INDEX OID* interval *INTERVAL* ( delta | absolute ) rising-threshold *RTHRE* ( event numbs | ) falling-threshold *FTHRE* ( event *NUMBER* | ) ( owner *OWNER* | )

no rmon alarm *Index*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INDEX | Alarm index. | 1-65535 |
| OID | Variable for setting alarm(etherStatsEntry.m.n ) | MIB OID |

| | | |
|---|---|---|
| INTERVAL | Specify the time in seconds the alarm monitors the MIB object(seconds). | 1-65535 |
| delta | Specify the delta keyword to test the change between samples of a MIB variable | - |
| absolute | Specify the absolute keyword to test each MIB variable directly | - |
| rising-threshold RTHRE | Alarm rising threshold. | -2147483648 - 2147483646 |
| event numbs | Specify the event number to trigger when the falling threshold | 1-65535 |
| falling-threshold FTHRE | Alarm falling threshold. | -2147483648-2147483646 |
| event NUMBER | Specify the event number to trigger when the falling threshold | 1-65535 |
| owner OWNER | exceeds its limit. | Up to 15 characters |

## Command Mode

Global Configuration

## Default

None

## Usage

We need to create events for rising threshold and falling threshold first before we create an alarm for a mib.

Also the statistics need to be created on an interface, because we only support to set alarm monitor on etherStatsEntry.

## Examples

This example shows how to set an alarm:

```
Switch# configure terminal
Switch(config)# rmon alarm 1 etherStatsEntry.3.1 interval 10 delta rising-threshold
1000 event 1 falling-threshold 5 event 1 owner test
```

## Related Commands

None

# 15.5.5 show rmon statistics

## Command Purpose

Use this command to show rmon statistics.

## Command Syntax

show rmon statistics ( *ID* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ID | Statistics index | 1-65535 |

## Command Mode

Privileged EXEC

## Default

None

## Usage

Show the interface statistics which collect by RMON

## Examples

This example shows how to show rmon statistics:

```
Switch# show rmon statistics
  Rmon collection index 1
        Statistics ifindex = 1, Owner: RMON_SNMP
        Input packets 0, octets 0, dropped 0
        Broadcast packets 0, multicast packets 0, CRC alignment errors 0,
collisions 0
        Undersized packets 0, oversized packets 0, fragments 0, jabbers 0
        # of packets received of length (in octets):
        64: 0,  65-127: 0, 128-255: 0
        256-511: 0,  512-1023: 0, 1024-max: 0
```

## Related Commands

None

# 15.5.6 show rmon history

## Command Purpose

Use this command to show rmon history statistics.

## Command Syntax

show rmon history ( *ID* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ID | History index | 1-65535 |

## Command Mode

Privileged EXEC

## Default

None

## Usage

Show the interface history statistics which collect by RMON

## Examples

This example shows how to show rmon history statistics:

```
Switch# show rmon history
  History index = 1
        Data source ifindex = 1
        Buckets requested = 1000
        Buckets granted = 1000
        Interval = 100
        Owner: test
        Sample # 1 Begin at 00:30:07
         Received 00 octets, 00 packets
         00 broadcast and 00 multicast packets
```

```
 00 undersized and 00 oversized packets
 00 fragments and 00 jabbers
 00 CRC alignment errors and 00 collisions.
 # of dropped packet events is 00
 Network utilization is estimated at 0
Sample # 2 Begin at 00:31:47
 Received 00 octets, 00 packets
 00 broadcast and 00 multicast packets
 00 undersized and 00 oversized packets
 00 fragments and 00 jabbers
 00 CRC alignment errors and 00 collisions.
 # of dropped packet events is 00
 Network utilization is estimated at 0
Sample # 3 Begin at 00:33:27
 Received 00 octets, 00 packets
 00 broadcast and 00 multicast packets
 00 undersized and 00 oversized packets
 00 fragments and 00 jabbers
 00 CRC alignment errors and 00 collisions.
 # of dropped packet events is 00
 Network utilization is estimated at 0
```

### Related Commands

None

## 15.5.7 show rmon event

### Command Purpose

Use this command to show rmon event.

### Command Syntax

show rmon event ( *ID* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ID | Event index. | 1-65535 |

### Command Mode

Privileged EXEC

### Default

None

## Usage

Show rmon events information

## Examples

This example shows how to show rmon event:

```
Switch# show rmon event
 event Index = 1
       Description: RMON_SNMP
       Event type Log & Trap
       Event community name public
       Last Time Sent = 00:00:00
       Owner  test
```

## Related Commands

None

# 15.5.8 show rmon alarm

## Command Purpose

Use this command to show rmon alarm

## Command Syntax

show rmon alarm ( *ID* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ID | Alarm index. | 1-65535 |

## Command Mode

Privileged EXEC

## Default

None

### Usage

Show rmon alarm information

### Examples

This example shows how to show rmon alarm:

```
Switch# show rmon alarm
alarm Index = 1
alarm status = VALID
        alarm Interval = 3600
        alarm Type is Delta
        alarm Value  = 00
        alarm Rising Threshold = 100
        alarm Rising Event = 1
        alarm Falling Threshold = 10
        alarm Falling Event = 1
        alarm Owner is test
```

### Related Commands

None

## 15.5.9 rmon clear counters

### Command Purpose

Use this command to clear rmon counters.

### Command Syntax

rmon clear counters

### Command Mode

Interface Configuration

### Default

None

### Usage

Clear counters on a interface

### Examples

This example shows how to clear rmon counters:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# rmon clear counters
```

### Related Commands

None

## 15.5.10 debug rmon

### Command Purpose

Use this command to open rmon debug.

### Command Syntax

debug rmon

no rmon debug

### Command Mode

Privileged EXEC

### Default

None

### Usage

Open rmon debug

### Examples

This example shows how to open rmon debug:

```
Switch# debug rmon
```

### Related Commands

None

## 15.6 SNMP Commands

### 15.6.1 snmp-server access

### Command Purpose

To set the access security of MIB view, use the snmp-server access command in global configuration mode. To remove the access security of MIB view, use the no form of this command.

### Command Syntax

snmp-server access *GROUP_NAME* security-model usm ( noauth | auth | priv ) ( { read *READ* | write *WRITE* | notify *NOTIFY* | context *CONTEXT* ( prefix | exact | ) } | )

no snmp-server access *GROUP_NAME* security-model usm ( noauth | auth | priv ) ( context *CONTEXT* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| GROUP_NAME | Name of the group | Up to 31 characters |
| security-model | Define the security model of the group | - |
| usm | SNMPv3 usm security model | - |
| auth | Specifies authentication of a packet without encrypting it | - |
| noauth | Specifies no authentication of a packet | - |
| priv | Specifies authentication of a packet with encryption | - |

| | | |
|---|---|---|
| context CONTEXT | (Optional) Specifies the SNMP context to associate with this SNMP group and its views. | Up to 31 characters |
| prefix | The context only match the prefix | - |
| exact | The context should match the whole part | - |
| READ | Optional) Specifies a read view for the SNMP group. This view enables you to view only the contents of the agent | Up to 31 characters |
| WRITE | (Optional) Specifies a write view for the SNMP group. This view enables you to enter data and configure the contents of the agent. | Up to 31 characters |
| NOTIFY | (Optional) Specifies a notify view for the SNMP group. This view enables you to specify a notify, inform, or trap | Up to 31 characters |

## Command Mode

Global Configuration

## Default

No SNMP access group is defined

## Usage

The command is used to create a access security for MIB view.

## Examples

The following is sample output from the snmp-server access command:

```
Switch# configure terminal
Switch(config)# snmp-server access manage security-model usm auth write _all_ read
_all_
```

## Related Commands

show snmp-server access

# 15.6.2 snmp-server community

## Command Purpose

To set up the community access string to permit access to the Simple Network Management Protocol (SNMP), use the snmp-server community command in global configuration mode. To remove the specified community string, use the no form of this command.

## Command Syntax

snmp-server community ( 8 | ) *STRING* ( read-only | read-write ) ( view *NAME* | )

no snmp-server community string

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| STRING | Community string that consists of 1 to 127 alphanumeric characters and functions much like a password, permitting access to SNMP. Blank spaces are not permitted in the community string ,support digit char and special char as ~!@#$%^&*()_+`-=,./;[]<:{} | A string with 1-127 characters |
| read-only | Specifies read-only access. Authorized management stations can retrieve only MIB objects | - |
| read-write | Specifies read-write access. Authorized management stations can both retrieve and modify MIB objects | - |
| view NAME | Specifies a previously defined view. The view defines the objects available to the SNMP community | Up to 31 characters |

| | | |
|---|---|---|
| 8 | Specifies a HIDDEN community will follow | - |

## Command Mode

Global Configuration

## Default

No SNMP community string is defined

## Usage

The no snmp-server command disables all versions of SNMP (SNMPv1, SNMPv2C, SNMPv3).

## Examples

The following example shows how to set the read/write community string to newstring.:

```
Switch# configure terminal
Switch(config)# snmp-server community newstring read-write
```

## Related Commands

snmp-server enable

# 15.6.3 snmp-server context

## Command Purpose

To create a Simple Network Management Protocol (SNMP) context, use the snmp-server context command in global configuration mode. To delete an SNMP context, use the no form of this command.

## Command Syntax

snmp-server context *CONTEXT*

no snmp-server context *CONTEXT*

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| CONTEXT | Name of the SNMP context being created | Up to 31 characters |

### Command Mode

Global Configuration

### Default

No SNMP contexts are configured

### Usage

When you use the no snmp-server context command, all SNMP instances in that context are deleted.

### Examples

The following is sample output from the snmp-server context command:

```
Switch# configure terminal
Switch(config)# snmp-server context contextA
```

### Related Commands

show snmp-server context

## 15.6.4 snmp-server enable

### Command Purpose

To enable the SNMP function, use the snmp-server enable command in global configuration mode. To disable the SNMP function, use the no form of this command.

### Command Syntax

snmp-server enable

no snmp-server enable

## Command Mode

Global Configuration

## Default

SNMP function is disabled

## Usage

The command is used to enable or disable snmp global.

## Examples

The following is sample output from the snmp-server enable command:

```
Switch# configure terminal
Switch(config)# snmp-server enable
```

## Related Commands

show snmp

# 15.6.5 snmp-server engineID

## Command Purpose

To specify the Simple Network Management Protocol (SNMP) engine ID on the local device, use the snmp-server engineID command in global configuration mode. To remove the configured engine ID, use the no form of this command.

## Command Syntax

snmp-server *engineID STRING*

no snmp-server *engineID*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| STRING | A string identifies the engine ID | String of a maximum of 64 characters that identifies the engine ID |

## Command Mode

Global Configuration

## Default

An SNMP engine ID is generated automatically but is not displayed or stored in the running configuration. You can display the default or configured engine ID by using the show snmp-server engineID command.

## Usage

The SNMP engine ID is a unique string used to identify the device for administration purposes. You do not need to specify an engine ID for the device. For further details on the SNMP engine ID, see RFC 2571.

## Examples

The following is sample output from the snmp-server engineID command:

```
Switch# configure terminal
Switch(config)# snmp-server engineID 30383038303830383038
```

## Related Commands

show snmp-server engineID

# 15.6.6 snmp-server group

## Command Purpose

To configure a new Simple Network Management Protocol (SNMP) group, use the snmp-server group command in global configuration mode. To remove a specified SNMP group, use the no form of this command.

## Command Syntax

snmp-server group *GROUP_NAME* user *USER_NAME* security-model usm

no snmp-server group *GROUP_NAME* user user-name security-model usm

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| GROUP_NAME | Name of the group | Up to 31 characters |
| USER_NAME | Name of the user in that group | Up to 31 characters |
| security-model | Define the group security model | - |
| usm | SNMPv3 usm model | - |

## Command Mode

Global Configuration

## Default

No SNMP server groups are configured.

## Usage

This command is used to add a new SNMP server group.

## Examples

The following is sample output from the snmp-server group command:

```
Switch# configure terminal
Switch(config)# snmp-server group SampleA user User1 security-model usm
```

## Related Commands

show snmp-server group

# 15.6.7 snmp-server notify

## Command Purpose

To set the notification of traps for Simple Network Management Protocol (SNMP), use the snmp-server notify command in global configuration mode. To restore to the default value, use the no form of this command.

## Command Syntax

snmp-server notify notify-name tag tag-name ( inform | trap | )

no snmp-server notify notify-name

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NOTIFY_NAME | Name of the notification | Up to 31 characters |
| TAG_NAME | Name of the tag | Up to 32 characters |
| inform | Set notify type(default is trap) to INFOR | - |
| trap | Set notify type(default is trap) to TRAP | - |

## Command Mode

Global Configuration

## Default

No SNMP notify names are configured

## Usage

This command is used to send events with the notification type of error to the SNMP server.

## Examples

The following is sample output from the snmp-server notify command:

```
Switch# configure terminal
Switch(config)# snmp-server notify note tag tt
```

## Related Commands

show snmp-server notify

## 15.6.8 snmp-server system-contact

### Command Purpose

To set the system contact (sysContact) string, use the snmp-server system-contact command in global configuration mode. To remove the system contact information, use the no form of this command.

### Command Syntax

snmp-server system-contact *TEXT*

no snmp-server system-contact

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| TEXT | String that describes the system contact information | Up to 255 characters |

### Command Mode

Global Configuration

### Default

No system contact string is set

### Usage

This command is used to set the system contact of the SNMP agent so that these descriptions can be accessed through the configuration file.

### Examples

The following is an example of a system contact string:

```
Switch# configure terminal
Switch(config)# snmp-server system-contact admin@exampledomain.com
```

### Related Commands

snmp-server system-location

## 15.6.9 snmp-server system-location

### Command Purpose

To set the system location string, use the snmp-server system-location command in global configuration mode. To remove the location string, use the no form of this command.

### Command Syntax

snmp-server system-location *TEXT*

no snmp-server system-location

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| TEXT | String that describes the system contact information | Up to 255 characters |

### Command Mode

Global Configuration

### Default

No system location string is set

### Usage

This command is used to set the system location of the SNMP agent so that these descriptions can be accessed through the configuration file.

### Examples

The following is an example of a system location string:

```
Switch# configure terminal
Switch(config)# snmp-server system-location Sample Place
```

### Related Commands

snmp-server system-contact

# 15.6.10 snmp-server target-address

## Command Purpose

To specify the recipient of a Simple Network Management Protocol (SNMP) notification message, use the snmp-server trap target-address command in global configuration mode. To remove the specified host from the configuration, use the no form of this command.

## Command Syntax

snmp-server target-address *NAME* param *PARAM* ( *IPV4_ADDR* | *IPV6_ADDR* ) ( { udpport *UDP_PORT* | timeout *TIMEOUT* | retries *RETRY* } | ) ( taglist *LINE* | )

snmp-server target-address *WORD* param *WORD* mgmt-if *IPV4_ADDR* ( { udpport *UDP_PORT* | timeout *TIMEOUT* | retries *RETRY* } | ) ( taglist *LINE* | )

no snmp-server target-address *WORD* ( mgmt-if | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | The name of the target address | Up to 31 characters |
| PARAM | Define a param name which help to find target params table | Up to 31 characters |
| mgmt-if | Management port | - |
| IPV4_ADDR | IPv4 address | IPv4 Address |
| IPV6_ADDR | IPv6 address | IPv6 Address |
| udpport port | (Optional) Specifies that SNMP notifications or informs are to be sent to an SNMP manager. The default port is 162 | 0-65535 |
| timeout number | (Optional) The timeout value, the default value is 15000 millisecond | 1-1800000 millisecond |
| retries number | (Optional) The retry time, the default value is 3 | 0-10 |
| taglist LINE | (Optional) The name of the taglist (128 tags are supported).split by blank.max length is 255 character | Up to 255 characters |

### Command Mode

Global Configuration

### Default

No snmp server is configured.

### Usage

This command is used to configure a remote manager's IP address.

This command is used for SNMP v3.

### Examples

The following is sample output from the snmp-server target-address command:

```
Switch# configure terminal
Switch(config)# snmp-server target-address targ1 param parm1 10.0.0.2 taglist
tmptag
```

### Related Commands

show snmp-server target-address

## 15.6.11 snmp-server target-params

### Command Purpose

To configure the parameters of the host to accept SNMP request message in global configuration mode. To remove the host`s parameters, use the no form of the command.

### Command Syntax

snmp-server target-params *PARAM* user *USER_NAME* security-model v3 message-processing v3 ( noauth | auth | priv )

no snmp-server target-params *USER_NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PARAM | Define a param name which help to find target params table | Up to 31 characters |
| USER_NAME | Name of user | Up to 31 characters |
| noauth | Specifies no authentication of a packet | - |
| auth | Specifies authentication of a packet without encrypting it | - |
| priv | Specifies authentication of a packet with encryption | - |

## Command Mode

Global Configuration

## Default

No snmp params is configured

## Usage

This command is used for SNMP v3.

## Examples

The following example shows how to set p1 parameters:

```
Switch# configure terminal
Switch(config)# snmp-server target-params p1 user u1 security-model v3 message-
processing v3 auth
```

## Related Commands

show snmp-server target-params

# 15.6.12 snmp-server trap enable

## Command Purpose

To enable all Simple Network Management Protocol (SNMP) notification types that are available on your system, use the snmp-server trap enable command in global

configuration mode. To disable all available SNMP notifications, use the no form of this command.

## Command Syntax

snmp-server trap enable *NOTIFICATION-TYPE*

no snmp-server trap enable *NOTIFICATION-TYPE*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NOTIFICATION-TYPE | Type of notification to enable or disable. If the all argument is specified, all notifications available on your device are enabled or disabled (if the no form is used) | all/bgp/coldstart/ipsla/linkdown/linkup/loopback-detect/ptp/synce/system/warmstart/bfd/cpu-traffic-limit |

## Command Mode

Global Configuration

## Default

No notifications controlled by this command are sent

## Usage

The snmp-server trap enable command is used in conjunction with the snmp-server trap target-address command. Use the snmp-server trap target-address command to specify which host or hosts receive SNMP notifications. To send notifications, you must configure at least one snmp-server trap target-address command.

## Examples

The following is sample output from the snmp-server trap enable command:

```
Switch# configure terminal
Switch(config)# snmp-server trap enable all
```

## Related Commands

snmp-server trap target-address

# 15.6.13 snmp-server trap delay

## Command Purpose

To delay snmp-server trap send, use the snmp-server trap delay command in global configuration mode. To disable trap delay, use the no form of this command.

## Command Syntax

snmp-server trap delay ( linkup | linkdown ) *TIMER*

no snmp-server trap delay ( linkup | linkdown )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| TIMER | The time to delay up/down.<br>Unit:100 millisecond | 1-100 |

## Command Mode

Global Configuration

## Default

No delay is enabled

## Usage

The link down and up trap will send immediately while link state change. The command can configure a delay time for link status trap. The unit is 100ms.

## Examples

The following is sample output from the snmp-server trap enable command:

```
Switch# configure terminal
Switch(config)# snmp-server trap delay linkup 10
```

## Related Commands

snmp-server trap target-address

# 15.6.14 snmp-server trap target-address

## Command Purpose

To configure a remote trap manager's IP address, use the snmp-server target-address command in global configuration mode. To remove the configuration, use the no form of this command.

## Command Syntax

snmp-server trap target-address ( mgmt-if | vrf *VRF_NAME* | ) ( *IPV4_ADDR* | *IPV6_ADDR* ) community *COMMUINTY* (8 | ) WORD ( udpport *UDP_PORT* | )

no snmp-server trap target-address ( mgmt-if | vrf *VRF_NAME* | ) ( *IPV4_ADDR* | *IPV6_ADDR* ) community *COMMUINTY* (8 | ) WORD ( udpport *UDP_PORT* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| mgmt-if | Management port | - |
| vrf VRF_NAME | VRF name | Up to 31 characters |
| IPV4_ADDR | IPv4 address | IPv4 Address |
| IPV6_ADDR | IPv6 address | IPv6 Address |
| COMMUINTY | Password-like community string sent with the notification operation | Up to 127 characters |
| UDP_PORT | (Optional) Specifies that SNMP notifications or informs are to be sent to an SNMP manager. The default port is 162 | 1-65535 |

## Command Mode

Global Configuration

## Default

The router does not send any trap messages.

## Usage

This command is used to specify the server target address to which the trap is sent.

## Examples

The following is sample output from the snmp-server trap target-address command:

```
Switch# configure terminal
Switch(config)# snmp-server trap target-address mgmt-if 192.168.1.100 community
test udpport 6000
```

## Related Commands

snmp-server trap enable

snmp-server trap source-address

# 15.6.15 snmp-server trap source-address

## Command Purpose

To configure the trap's source IP address, use the snmp-server source-address command in global configuration mode. To remove the configuration, use the no form of this command.

## Command Syntax

snmp-server trap source-address ( vrf *WORD* | ) ( *IPV4_ADDR* )

no snmp-server trap source-address

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| vrf WORD | VRF name | Up to 31 characters |
| IPV4_ADDR | IPv4 address | IPv4 Address |

## Command Mode

Global Configuration

## Default

The router does not send any trap messages.

## Usage

This command is used to specify the server source IP address to which the trap is sent. Please check if the source IP exists in an interface which is up

## Examples

The following is sample output from the snmp-server trap source-address command:

```
Switch# configure terminal
Switch(config)# snmp-server trap source-address 192.168.1.100
```

## Related Commands

snmp-server trap target-address

# 15.6.16 snmp-server inform target-address

## Command Purpose

To specify the recipient of a Simple Network Management Protocol (SNMP) inform message, use the snmp-server inform target-address command in global configuration mode. To remove the specified host from the configuration, use the no form of this command.

## Command Syntax

snmp-server inform target-address ( mgmt-if | vrf *VRF_NAME* | ) ( *IPV4_ADDR* | *IPV6_ADDR* ) community *COMMUINTY* ( udpport *UDP_PORT* | )

no snmp-server inform target-address ( mgmt-if | vrf *VRF_NAME* | ) ( *IPV4_ADDR* | *IPV6_ADDR* ) community *COMMUINTY* ( udpport *UDP_PORT* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| mgmt-if | Management port | - |
| vrf VRF_NAME | VRF name | Up to 31 characters |
| IPV4_ADDR | IPv4 address | IPv4 Address |
| IPV6_ADDR | IPv6 address | IPv6 Address |
| COMMUINTY | Password-like community string sent with the notification operation | Up to 127 characters |

| | | |
|---|---|---|
| UDP_PORT | (Optional) Specifies that SNMP notifications or informs are to be sent to an SNMP manager. The default port is 162 | 1-65535 |

## Command Mode

Global Configuration

## Default

The router does not send any inform messages

## Usage

This command is used to specify the server target address to which the inform is sent.

## Examples

The following is sample output from the snmp-server inform target-address command:

```
Switch# configure terminal
Switch(config)# snmp-server inform target-address mgmt-if 192.168.1.100 community
test udpport 6000
```

## Related Commands

None

# 15.6.17 snmp-server inform

## Command Purpose

Use this command in global to configure Simple Network Management Protocol (SNMP) inform message parameters, include timeout and retries.Use the no form of this command to remove inform parameters.

## Command Syntax

snmp-server inform ( { retries *RETRY* | timeout *TIMEOUT* } )

no snmp-server inform ( retries | timeout | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| RETRY | The retry time, the default value is 3 | 0-10 |
| TIMEOUT | The timeout value, the default value is 15 second | 1-1800s |

## Command Mode

Global Configuration

## Default

No snmp inform parameters is configured

## Usage

This command is used for SNMP v2.

## Examples

The following example shows how to configure inform message parameters:

```
Switch(config)# snmp-server inform timeout 10 retries 5
```

## Related Commands

None

# 15.6.18 snmp-server version

## Command Purpose

To specify the support of SNMP version, use the snmp-server version command in global configuration mode. To restore to the default value, use the no form of this command.

## Command Syntax

snmp-server version ( all | v1 | v2c | v3 )

no snmp-server version

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| all | Support all versions (v1, v2c, and v3) | - |
| v1 | Support only v1 version | - |
| v2c | Support only v2c version | - |
| v3 | Support only v3 version | - |

## Command Mode

Global Configuration

## Default

Support all SNMP versions

## Usage

This command is used to set the SNMP version the switch supported.

## Examples

The following is sample output from the snmp-server version command:

```
Switch# configure terminal
Switch(config)# snmp-server version all
```

## Related Commands

show snmp-server version

# 15.6.19 snmp-server view

## Command Purpose

To create or update a view entry, use the snmp-server view command in global configuration mode. To remove the specified Simple Network Management Protocol (SNMP) server view entry, use the no form of this command.

## Command Syntax

snmp-server view *NAME* ( included | excluded ) sub-tree

no snmp-server view *NAME* ( included | excluded ) sub-tree

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | Label for the view record that you are updating or creating. The name is used to reference the record | Up to 31 characters |
| included | Configures the OID (and subtree OIDs) specified in sub-tree argument to be included in the SNMP view | - |
| excluded | Configures the OID (and subtree OIDs) specified in sub-tree argument to be explicitly excluded from the SNMP view | - |
| sub-tree | Object identifier of the ASN.1 subtree to be included or excluded from the view | - |

## Command Mode

Global Configuration

## Default

No view entry exists

## Usage

Other SNMP commands require an SMP view as an argument. You use this command to create a view to be used as arguments for other commands.

## Examples

The following is sample output from the snmp-server view command:

```
Switch# configure terminal
Switch(config)# snmp-server view abc excluded 1.3.6.2
```

## Related Commands

show snmp-server view

# 15.6.20 snmp-server access-group NAME in

## Command Purpose

To set the access group, use the snmp-server access-group command in global configuration mode. To remove the access group, use the no form of this command.

## Command Syntax

snmp-server access-group *NAME* in

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | Access-list name | Up to 40 characters |
| in | Inbound packets | - |

## Command Mode

Global Configuration

## Default

No access group is defined

### Usage

The command is used to apply ACL in snmp.

### Examples

The following is sample output from the snmp-server access command:

```
Switch# configure terminal
Switch(config)# snmp-server access-group abc in
```

### Related Commands

None

## 15.6.21 show snmp

### Command Purpose

To display the services information of SNMP, use the show snmp command in privileged EXEC mode.

### Command Syntax

show snmp

### Command Mode

Privileged EXEC

### Default

None

### Usage

This command is used to display the service information of SNMP (enable or disable).

## Examples

The following is sample output from the show snmp command:

```
Switch# show snmp
SNMP services: enable
```

## Related Commands

snmp-server enable

# 15.6.22 show snmp-server access

## Command Purpose

To display the ACL information of SNMP, use the show snmp-server access command in privileged EXEC mode.

## Command Syntax

show snmp-server access ( *GROUP_NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| GROUP_NAME | Specify a group name | Up to 31 characters |

## Command Mode

Privileged EXEC

## Default

None

## Usage

This command is used to display the access information configured by command snmp-server access.

## Examples

The following is sample output from the show snmp-server access command:

```
Switch# show snmp-server access gp1
Group name:         gp1
Context:            test
Security model:     usm
Security level:     auth
Context Match:      exact
Read view:          _all_
Write view:         none
Notify view:        none
Storage Type:       permanent
Row status:         active
```

### Related Commands

snmp-server access

## 15.6.23 show snmp-server community

### Command Purpose

To display the SNMP community information, use the show snmp-server community command in privileged EXEC mode.

### Command Syntax

show snmp-server community

### Command Mode

Privileged EXEC

### Default

None

### Usage

This command is used to display the community information configured by command snmp-server community.

### Examples

The following is sample output from the show snmp-server community command:

```
Switch# show snmp-server community
Community-Access   Community-String     Security-name
=================================================================
read-only          public               comm1
read-write         private              comm3
read-only          public               comm2
read-write         private              comm4
```

### Related Commands

snmp-server community

## 15.6.24 show snmp-server context

### Command Purpose

To display the SNMP context information, use the show snmp-server context command in privileged EXEC mode.

### Command Syntax

show snmp-server context

### Command Mode

Privileged EXEC

### Default

None

### Usage

This command is used to display the context information configured by command snmp-server context.

### Examples

The following is sample output from the show snmp-server context command:

```
Switch# show snmp-server context
samplecontext
```

### Related Commands

snmp-server context

## 15.6.25 show snmp-server engineID

### Command Purpose

To display the identification of the local Simple Network Management Protocol (SNMP) engine and all remote engines that have been configured on the router, use the show snmp-server engineID command in EXEC mode.

### Command Syntax

show snmp-server *engineID*

### Command Mode

Privileged EXEC

### Default

None

### Usage

An SNMP engine is a copy of SNMP that can reside on a local or remote device.

### Examples

The following example specifies 00000009020000000c025808 as the local engineID:

```
Switch# show snmp-server engineID
Engine ID   : 00000009020000000c025808
```

### Related Commands

snmp-server engineID

# 15.6.26 show snmp-server group

## Command Purpose

To display the names of configured SNMP groups, the security model being used, the status of the different views, and the storage type of each group, use the show snmp-server group command in privileged EXEC mode.

## Command Syntax

show snmp-server group ( *GROUP_NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| GROUP_NAME | Specify a group name | Up to 31 characters |

## Command Mode

Privileged EXEC

## Default

None

## Usage

SNMP groups are configured using the snmp-server group command.

## Examples

The following is sample output from the show snmp-server group command:

```
Switch# show snmp-server group
Group-name           model          Security-name
============================================================
a11                    usm            a
a11                    usm            ab
```

## Related Commands

snmp-server group

# 15.6.27 show snmp-server notify

## Command Purpose

To display notification information of SNMP, use the show snmp-server notify command in privileged EXEC mode.

## Command Syntax

show snmp-server notify ( *GROUP_NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| GROUP_NAME | Specify a group name | Up to 31 characters |

## Command Mode

Privileged EXEC

## Default

None

## Usage

This command is used to display the notification information configured by command snmp-server notify.

## Examples

The following is sample output from the show snmp-server notify command:

```
Switch# show snmp-server notify
Notify-name             Notify-type
============================================================
sample                   trap
```

## Related Commands

snmp-server notify

# 15.6.28 show snmp-server sys-info

## Command Purpose

To display the system information of SNMP, use the show snmp-server sys-info command in privileged EXEC mode.

## Command Syntax

show snmp-server sys-info

## Command Mode

Privileged EXEC

## Default

None

## Usage

The system contact can be set by using the snmp-server system-contact command. The system location can be set by using the snmp-server system-location command.

## Examples

The following is sample output from the show snmp-server sys-info command:

```
Switch# show snmp-server sys-info
Contact:    admin@sampledomain.com
Location:   Denvor
```

## Related Commands

snmp-server system-contact

snmp-server system-location

## 15.6.29 show snmp-server trap-receiver

### Command Purpose

To display the SNMP traps receiver, use the show snmp-server trap-receiver command in privileged EXEC mode.

### Command Syntax

show snmp-server trap-receiver

### Command Mode

Privileged EXEC

### Default

None

### Usage

This command is used to display traps receiver information configured by command snmp-server trap target-addres.

### Examples

The following is sample output from the show snmp-server trap-receiver command:

```
Switch# show snmp-server trap-receiver
Target-ipaddress  udpport  version  pdu-type  community
============================================================
1.1.1.1           234      v2c      inform    public
1.1.1.1           234      v2c      trap      public
1.1.1.1           234      v1       trap      public
```

### Related Commands

snmp-server trap target-addres

# 15.6.30 show snmp-server usm-user

## Command Purpose

To display information about the configured characteristics of Simple Network Management Protocol (SNMP) users, use the show snmp-server usm-user command in privileged EXEC mode.

## Command Syntax

show snmp-server usm-user ( *USERNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| USERNAME | (Optional) Name of a specific user or users about which to display SNMP information | Up to 31 characters |

## Command Mode

Privileged EXEC

## Default

None

## Usage

An SNMP user must be part of an SNMP group, as configured using the snmp-server usm-user command.

## Examples

The following is sample output from the show snmp-server usm-user command:

```
Switch# show snmp-server usm-user user1
EnginedID:        01234567890123456789
User Name:       user1
Auth Protocol:     md5
priv Protocol:      des
Storage Type:      nonvolatile
Row status:        active
```

### Related Commands

snmp-server usm-user

## 15.6.31 show snmp-server version

### Command Purpose

To display the supported version of SNMP, use the show snmp-server version command in privileged EXEC mode.

### Command Syntax

show snmp-server version

### Command Mode

Privileged EXEC

### Default

None

### Usage

This command is used to display snmp version information configured by command snmp-server version.

### Examples

The following is sample output from the show snmp-server version command:

```
Switch# show snmp-server version
SNMPv1/SNMPv2c/SNMPv3
```

### Related Commands

snmp-server version

# 15.6.32 show snmp-server view

## Command Purpose

To display the family name, storage type, and status of a Simple Network Management Protocol (SNMP) configuration and associated MIB, use the show snmp-server view command in privileged EXEC mode.

## Command Syntax

show snmp-server view ( *NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | Specify a view name | Up to 31 characters |

## Command Mode

Privileged EXEC

## Default

None

## Usage

Use this command to display the SNMP view configuration.

## Examples

The following is sample output from the show snmp-server view command:

```
Switch# show snmp-server view
View-name        View-type         Subtree
=============================================================
abc               excluded          .1.3.6.2
_all_              included           .0
_all_              included           .1
_all_              included           .2
_none_            excluded          .0
_none_            excluded          .1
_none_            excluded          .2
```

## Related Commands

snmp-server view

# 15.6.33 snmp-server udp-port

## Command Purpose

To configure the snmp's listenning udp port, use the snmp-server udp-port command in global configuration mode. To remove the configuration, use the no form of this command.

## Command Syntax

snmp-server udp-port *PORT*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PORT | Specify the udp port of SNMP listening | <1025-65535> |

## Command Mode

Global Configuration

## Default

The default listening udp port is 161

## Usage

This command is used to specify the udp port of SNMP listening function.

## Examples

The following is sample output from the snmp-server udp-port command:

```
Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# snmp-server udp-port 60001
This operation will cause all NMS connection to be closed.
Are you sure to change SNMP udp port? [Y/N]y
```

## Related Commands

None

# 15.6.34 snmp-server trap source-port

## Command Purpose

To configure the trap's source udp port, use the snmp-server trap source-port command in global configuration mode. To remove the configuration, use the no form of this command.

## Command Syntax

snmp-server trap source-port *PORT*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PORT | Specify the source udp port of SNMP trap/inform | <1025-65535> |

## Command Mode

Global Configuration

## Default

Use avaiable random udp port as trap/inform source port

## Usage

This command is used to specify the souce udp port of SNMP trap/inform packets

## Examples

The following is sample output from the snmp-server trap source-port command:

```
Switch# configure terminal
Switch(config)# snmp-server trap source-port 60002
This operation will change all source port of trap/inform messages.
Are you sure to change SNMP trap source port? [Y/N]y
```

### Related Commands

snmp-server trap target

## 15.7 SFLOW Commands

### 15.7.1 sflow enable

#### Command Purpose

Use this command to enable or disable sFlow globally.

#### Command Syntax

sflow enable

no sflow enable

#### Command Mode

Global Configuration

#### Default

Disabled

#### Usage

Before any other sFlow command can be configured, sFlow services must be enabled globally. Use the no parameter with this command to remove all sFlow configurations and disable sFlow globally.

#### Examples

This example shows how to enable sFlow services globally:

```
Switch# configure terminal
Switch(config)# sflow enable
```

### Related Commands

show sflow

## 15.7.2 sflow agent

### Command Purpose

Use this command to configure sFlow agent.

### Command Syntax

sflow agent ( ip *IPV4_ADDR* | ipv6 ipv6-addres )

no sflow agent ( ip | ipv6 )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IPV4_ADDR | Agent IPv4 address | IPv4 Address |
| IPV6_ADDR | Agent IPv6 address | IPv6 Address |

### Command Mode

Global Configuration

### Default

None

### Usage

Use this command to configure IP address for sflow agent. If not configured and router-id has configured, sflow will use the valid interface with max router-id and then never change.

### Examples

This example shows how to configure agent with IP address 10.0.0.254.:

```
Switch# configure terminal
Switch(config)# sflow agent ip 10.0.0.254
```

## Related Commands

show sflow

# 15.7.3 sflow collector

## Command Purpose

Use this command to configure sFlow collector.

## Command Syntax

sflow collector ( mgmt-if | vrf *WORD* | ) ( *IPV4_ADDR* | ipv6-addres ) ( *UDP_PORT* | )

no sflow collector ( mgmt-if | vrf *WORD* | ) ( *IPV4_ADDR* | ipv6-addres ) ( *UDP_PORT* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| mgmt-if | Management port | - |
| vrf WORD | VRF name | Up to 31 characters |
| IPV4_ADDR | Collector IPv4 address | IPv4 Address |
| IPV6_ADDR | Collector IPv6 address | IPv6 Address |
| UDP_PORT | Collector UDP port number, default is 6343 | 1-65535 |

## Command Mode

Global Configuration

## Default

None

## Usage

Use this command to add a collector by specifying the combination of IP address and UDP port. Only up to two unique combinations can be allowed to add. Use the no parameter with this command to delete collector.

### Examples

This example shows how to add a collector with IP address 10.0.0.254 and UDP port 3000 and mgmt-if.:

```
Switch# configure terminal
Switch(config)# sflow collector mgmt-if 10.0.0.254 3000
```

### Related Commands

show sflow

## 15.7.4 sflow counter interval

### Command Purpose

Use this command to configure sFlow polling-interval for counter sample.

### Command Syntax

sflow counter interval *INTERVAL*

no sflow counter interval

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INTERVAL | Interval value in second | 1-2000 second |

### Command Mode

Global Configuration

### Default

20 seconds

### Usage

Use this command to set sFlow polling-interval for counter sample. Use the no parameter with this command to restore to the default value. Default interval value is 20 seconds.

### Examples

This example shows how to set sFlow polling-interval to 10 second:

```
Switch# configure terminal
Switch(config)# sflow counter interval 10
```

### Related Commands

show sflow

## 15.7.5 sflow counter-sampling enable

### Command Purpose

Use this command to enable or disable counter sampling on specified port.

### Command Syntax

sflow counter-sampling enable

no sflow counter-sampling enable

### Command Mode

Interface Configuration

### Default

Disabled

### Usage

Use this command to enable counter sampling on specified port. Use the no parameter with this command to disable counter sampling. By default, sFlow counter sampling is disabled in all ports.

This command can only be configured on a port which is not a link-agg group member. The port can be either a physical port or a link-agg port.

## Examples

This example shows how to enable sFlow counter sampling on interface eth-0-1:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# sflow counter-sampling enable
```

## Related Commands

show sflow

# 15.7.6 sflow flow-sampling rate

## Command Purpose

Use this command to configure flow sampling rate.

## Command Syntax

sflow flow-sampling rate *RATE*

no sflow flow-sampling rate

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| RATE | Sample rate value | must be a power of 2, the range is 32-1048576 |

## Command Mode

Interface Configuration

## Default

8192

## Usage

Use this command to set sFlow packet sampling rate. Use no parameter with this command to set default sampling rate. Default sampling rate value is 8192.

sFlow uses CPU resources to collect samples and send samples to the collector. If a low sampling rate is set, CPU utilization can become high. To protect CPU from

overwhelming, exceeded flow samples would be dropped. If a sampling rate less than default value is configured, a prompt will be given to info the potential of involving a high CPU utilization.

This command can only be configured on a port which is not a link-agg group member. The port can be either a physical port or a link-agg port.

### Examples

This example shows how to set the sFlow sampling rate to 2048 on eth-0-1:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# sflow flow-sampling rate 2048
% Warning: sFlow sampling requires high CPU usage, especially with a low rate.
  It is suggested not configure a rate less than default value 8192.
```

### Related Commands

show sflow

## 15.7.7 sflow flow-sampling enable

### Command Purpose

Use this command to enable or disable packet sampling on individual port.

### Command Syntax

sflow flow-sampling enable ( input | output | both )

no sflow flow-sampling enable ( input | output | both )

### Command Mode

Interface Configuration

### Default

Disabled

### Usage

Use this command to enable ingress direction of packet sampling on individual port. Use the no parameter with this command to disable packet sampling. By default, sFlow packet sampling is disabled in all ports.

This command can only be configured on a port which is not a link-agg group member. The port can be either a physical port or a link-agg port.

### Examples

This example shows how to enable input packet sampling on route port eth-0-1:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# sflow flow-sampling enable input
```

### Related Commands

show sflow

## 15.7.8 show sflow

### Command Purpose

Use this command to show the running information of sflow.

### Command Syntax

show sflow

### Command Mode

Privileged EXEC

### Default

None

## Usage

Use this command to show the running information of sflow.

## Examples

This example shows how to show the sflow running information:

```
Switch# show sflow
sFlow Version: 5
sFlow Global Information:
 Agent IP address                  : 0.0.0.0
 Counter Sampling Interval      : 20 seconds
 Collector IP                      : Not configured
sFlow Port Information:
                Flow-Sample   Flow-Sample
 Port        Counter     Flow      Direction     Rate
 ---------------------------------------------------------
 eth-0-1     Disable     Enable    Input          8192
```

## Related Commands

sflow enable

sflow collector

# 15.7.9 sflow source

## Command Purpose

Use this command to set the source address of sflow.

## Command Syntax

sflow source ip *IPV4_ADDR*

no sflow source ip

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IPV4_ADDR | IPv4 address of the source | IPv4 address |

## Command Mode

Global Configuration

### Default

none

### Usage

Use this command to set the source address of sflow.

### Example

The following example shows how to configure the source address of sflow:

```
Switch# configure terminal
Switch(config)# sflow source ip 10.0.0.254
```

### Related Commands

show sflow

## 15.8 LLDP Commands

### 15.8.1 lldp enable(global)

#### Command Purpose

To enable LLDP function globally, use the lldp enable command in global configuration mode. To disable this function, use the no form of this command.

#### Command Syntax

lldp enable

lldp disable

#### Command Mode

Global Configuration

### Default

Disable

### Usage

None

### Examples

The following example shows how to enable LLDP globally:

```
Switch# configure terminal
Switch(config)# lldp enable
```

### Related Commands

lldp enable(接口)

## 15.8.2 lldp enable(interface)

### Command Purpose

To enable LLDP function on interface, use the lldp enable command in interface configuration mode. To disable this function, use the no form of this command.

### Command Syntax

lldp enable ( txonly | txrx | rxonly )

lldp disable

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| txonly | Enable lldp pdu transmission | - |
| txrx | Enable lldp pdu transmission and reception | - |
| rxonly | Enable lldp pdu reception | - |

## Command Mode

Interface Configuration

## Default

Enable

## Usage

None

## Examples

The following example shows how to enable LLDP on interface:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# lldp enable txrx
```

## Related Commands

lldp enable(全局)

# 15.8.3 lldp system-name

## Command Purpose

To configure system name for System Name TLV, use the lldp system-name command in global configuration mode. To restore the default configuration, use the no form of this command.

## Command Syntax

lldp system-name *NAME*

no lldp system-name

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | System Name. | A string with 1-64 characters |

### Command Mode

Global Configuration

### Default

Default system name is used.

### Usage

If no system name is configured, the default system name will be used.

### Examples

The following example shows how to configure system name:

```
Switch# configure terminal
Switch(config)# lldp system-name switch
```

### Related Commands

lldp enable(全局)

lldp enable(接口)

## 15.8.4 lldp system-description

### Command Purpose

To configure system description for System Description TLV, use the lldp system-description command in global configuration mode. To restore the default configuration, use the no form of this command.

### Command Syntax

lldp system-description *LINE*

no lldp system-description

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| LINE | System Description. The range is from 1 to 255 and space is allowed | A string with 1-255 characters |

## Command Mode

Global Configuration

## Default

Default system description is used.

## Usage

If no system description is configured, the default system description will be used.

## Examples

The following example shows how to configure system description:

```
Switch# configure terminal
Switch(config)# lldp system-description switch
```

## Related Commands

lldp enable(全局)

lldp enable(接口)

# 15.8.5 lldp management

## Command Purpose

To configure management ip address for Management Address TLV, use the lldp management ip command in global configuration mode. To restore the default configuration, use the no form of this command.

## Command Syntax

lldp management ( ip *ADDRESS* | interface *IFNAME* )

no lldp management ( ip | interface )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ADDRESS | IPv4 address, like 1.1.1.1 | IPv4 Address |
| IFNAME | Name of L3 interface | Support physical/aggregation/loopback/vlan/tunnel/management ports |

## Command Mode

Global Configuration

## Default

Default management address is used.

## Usage

The configured IP address has higher priority than configured interface.If both of themare not be configured, system should use the loopbackinterface, management interface , other interface or system MAC address according descend order of priority.

## Examples

The following example shows how to configure the management ip address.:

```
Switch# configure terminal
Switch(config)# lldp management ip 192.168.1.2
```

## Related Commands

lldp enable(全局)

lldp enable(接口)

## 15.8.6 lldp msg-tx-hold

### Command Purpose

To configure msg-tx-hold, use the lldp msg-tx-hold command in global configuration. To restore the default configuration, use the no form of this command.

### Command Syntax

lldp msg-tx-hold *NUMBER*

no lldp msg-tx-hold

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NUMBER | msg-tx-hold value | 2-10 |

### Command Mode

Global Configuration

### Default

The default value of msg-tx-hold is 4.

### Usage

None

### Examples

The following example shows how to configure msg-tx-hold:

```
Switch# configure terminal
Switch(config)# lldp msg-tx-hold 3
```

### Related Commands

lldp enable(全局)

lldp enable(接口)

## 15.8.7 lldp timer msg-tx-interval

### Command Purpose

To configure msg-tx-interval, use the lldp timer msg-tx-interval command in global configuration. To restore the default configuration, use the no form of this command.

### Command Syntax

lldp timer msg-tx-interval *NUMBER*

no lldp timer msg-tx-interval

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NUMBER | msg-tx-interval value | msg-tx-hold |

### Command Mode

Global Configuration

### Default

The default value of msg-tx-interval is 30s.

### Usage

None

### Examples

The following example shows how to configure msg-tx-interval:

```
Switch# configure terminal
Switch(config)# lldp timer msg-tx-interval 20
```

### Related Commands

lldp enable(global)

lldp enable(interface)

## 15.8.8 lldp timer reinit-delay

### Command Purpose

To configure reinitDelay, use the lldp timer reinitDelay command in global configuration. To restore the default configuration, use the no form of this command.

### Command Syntax

lldp timer reinit-delay *NUMBER*

no lldp timer reinit-delay

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NUMBER | reinit-delay value | 1-10 |

### Command Mode

Global Configuration

### Default

The default value of reinitDelay is 2s.

### Usage

None

### Examples

The following example shows how to configure reinitDelay:

```
Switch# configure terminal
Switch(config)# lldp timer reinit-delay 1
```

### Related Commands

lldp enable(全局)

lldp enable(接口)

# 15.8.9 lldp timer tx-delay

## Command Purpose

To configure tx-delay, use the lldp timer tx-delay command in global configuration. To restore the default configuration, use the no form of this command.

## Command Syntax

lldp timer tx-delay *NUMBER*

no lldp timer tx-delay

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NUMBER | tx-delay value | 1-8192 |

## Command Mode

Global Configuration

## Default

The default value of tx-delay is 2s.

## Usage

The value of tx-delay should obey the formula: 1 <= tx-delay <= ((0.25)* msg-tx-interval.

## Examples

The following example shows how to configure tx-delay:

```
Switch# configure terminal
Switch(config)# lldp timer tx-delay 3
```

## Related Commands

lldp enable(全局)

lldp enable(接口)

# 15.8.10 lldp tlv basic

## Command Purpose

To select the basic tlv used in LLDP packet, use the lldp tlv basic command in interface configuration. To cancel the tlv, use the no form of this command..

## Command Syntax

lldp tlv basic { port-description | system-name | system-description | system-capabilities | management-address | all }

no lldp tlv basic { port-description | system-name | system-description | system-capabilities | management-address | all }

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| port-description | Select Port Description Tlv | - |
| system-name | Select System Name Tlv | - |
| system-description | Select System Description Tlv | - |
| system-capabilities | Select System Capabilities Tlv | - |
| management-address | Select Management Address Tlv | - |
| all | Select All basic tlvs | - |

## Command Mode

Interface Configuration

## Default

All basic tlvs is selected.

## Usage

None

## Examples

The following example shows how to select basic tlv:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# lldp tlv basic system-name
```

## Related Commands

lldp enable(global)

lldp enable(interface)

# 15.8.11 lldp tlv 8021-org-specific

## Command Purpose

To select the IEEE 802.1 tlvs used in LLDP packet, use the lldp tlv 8021-org-specific command in interface configuration. To cancel the tlv, use the no form of this command..

## Command Syntax

lldp tlv 8021-org-specific { port-vlan | protocol-vlan | vlan-name | protocol-id | link-aggregation | dcbx | all }

no lldp tlv 8021-org-specific { port-vlan | protocol-vlan | vlan-name | protocol-id | link-aggregation | dcbx | all }

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| port-vlan | Select Port Vlan ID Tlv | - |
| protocol-vlan | Select Port and Protocol Vlan ID Tlv | - |
| vlan-name | Select Vlan Name Tlv | - |
| protocol-id | Select Protocol Identity Tlv | - |
| link-aggregation | Select Link Aggregation Tlv | - |
| dcbx | Select DCBX TLV | - |
| all | Select All IEEE 802.1 tlvs, exclude Link Aggregation Tlv | - |

## Command Mode

Interface Configuration

## Default

All IEEE 802.1 tlvs is selected, exclude Link Aggregation Tlv.

## Usage

Link Aggregation Tlv in IEEE 802.3 tlv set is used by default.

## Examples

The following example shows how to select IEEE 802.1 tlv :

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# lldp tlv 8021-org-specific vlan-name
```

## Related Commands

lldp enable(global)

lldp enable(interface)

# 15.8.12 lldp tlv 8021-org-specific vlan-name-value

## Command Purpose

To configure the value forVLAN NAME TLV in the IEEE 802.1 tlvs, use the lldp tlv 8021-org-specific vlan-name-value command in interface configuration. To cancel the configuration, use the no form of this command..

## Command Syntax

lldp tlv 8021-org-specific vlan-name-value *VLAN_ID*

no lldp tlv 8021-org-specific vlan-name-value

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | The value of Vlan ID for the VLAN NAME TLV | 1-4094 |

## Command Mode

Interface Configuration

## Default

The VLAN NAME TLV will contain the information of native vlan.

## Usage

None

## Examples

The following example shows how to configure VLAN NAME TLV :

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# lldp tlv 8021-org-specific vlan-name-value 2000
```

## Related Commands

lldp enable(global)

lldp enable(interface)

# 15.8.13 lldp tlv 8023-org-specific

## Command Purpose

To select the IEEE 802.3 tlvs used in LLDP packet, use the lldp tlv 8023-org-specific command in interface configuration. To cancel the tlv, use the no form of this command..

## Command Syntax

lldp tlv 8023-org-specific { mac-phy-cfg | power | link-aggregation | max-frame-size | all }

no lldp tlv 8023-org-specific { mac-phy-cfg | power | link-aggregation | max-frame-size | all }

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| mac-phy-cfg | Select MAC/PHY Configuration/Status TLV | - |
| power | Select Power Via MDI Tlv | - |

| | | |
|---|---|---|
| link-aggregation | Select Link Aggregation Tlv | - |
| max-frame-size | Select Maximum Frame Size Tlv | - |
| all | Select All IEEE 802.3 tlvs | - |

## Command Mode

Interface Configuration

## Default

All IEEE 802.3 tlvs is selected.

## Usage

Link Aggregation Tlv in IEEE 802.3 tlv set is used by default.

## Examples

The following example shows how to select IEEE 802.3 tlv :

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# lldp tlv 8023-org-specific power
```

## Related Commands

lldp enable(global)

lldp enable(interface)

# 15.8.14 lldp tlv med

## Command Purpose

To select the MED tlvs used in LLDP packet, use the lldp tlv med command in interface configuration. To cancel the tlv, use the no form of this command..

## Command Syntax

lldp tlv med { network-policy | ext-power | inventory | all }

no lldp tlv med { network-policy | ext-power | inventory | all }

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| network-policy | Select Network Policy TLV | - |
| ext-power | Select Extend Power-Via-MDI Tlv | - |
| inventory | Select Inventory Tlv | - |
| all | Select All MED tlvs, exclude Location Identification Tlv | - |

## Command Mode

Interface Configuration

## Default

All MED tlvs is selected, exclude Location Identification Tlv.

## Usage

LLDP-MED Capabilities TLV will be added automatically when any other tlv in MED tlv set was selected, and canceled when no other MED tlv except itself was selected.

## Examples

The following example shows how to select MED tlv :

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# lldp tlv med inventory
```

## Related Commands

lldp enable(global)

lldp enable(interface)

# 15.8.15 lldp tlv med location-id

## Command Purpose

To select and configure the MED Location-id tlv used in LLDP packet, use the lldp tlv med location-id command in interface configuration. To cancel the tlv, use the no form of this command..

## Command Syntax

lldp tlv med location-id ( ecs-elin *VALUE* | civic *DEV-TYPE CODE CA1-TYPE CA1-VALUE* ( *CA2-TYPE CA2-VALUE* ( *CA3-TYPE CA3-VALUE* ( *CA4-TYPE CA4-VALUE* ( *CA5-TYPE CA5-VALUE* ( *CA6-TYPE CA6-VALUE* ( *CA7-TYPE CA7-VALUE* ( *CA8-TYPE CA8-VALUE* ( *CA9-TYPE CA9-VALUE* ( *CA10-TYPE CA10-VALUE* | ) | ) | ) | ) | ) | ) | ) | ) )

no lldp tlv med location-id

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ecs-elin VALUE | The ECS-ELIN address should be a telephone number | The ECS-ELIN address should be a telephone number in range [10-25] |
| civic DEV-TYPE | DEV-TYPE , 0 - DHCP Server, 1 - the closet network device, 2 - current devic | 0-2 |
| CODE | The two-letter ISO 3166 country code in capital ASCII letters, eg., US | CODE, The two-letter ISO 3166 country code in capital ASCII letters |
| CA(n)-TYPE CA(n)-VALUE | n = 1-10 | CA-TYPE CA-VALUE, The max number of address is 10, the range of CA-TYPE is 0-255, the length of CA-VALUE is [1-232] |

## Command Mode

Interface Configuration

## Default

None

## Usage

None

## Examples

The following example shows how to configure MED location-id tlv :

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# lldp tlv med location-id ecs-elin 1234567890
```

## Related Commands

lldp enable(global)

lldp enable(interface)

# 15.8.16 debug lldp

## Command Purpose

Use this command to turn on the debug switches of LLDP module.

To restore the default, use the no form of this command

## Command Syntax

debug lldp ( events | packet | all | tlv-info )

no debug lldp ( events | packet | all | tlv-info )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| events | LLDP events | - |
| packet | LLDP Packet information | - |
| all | Turn all debugging on | - |
| tlv-info | Enable TLV information debugs | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

Use command "terminal monitor" to make debug messages print on the VTY immediately.

Use command "show logging buffer" to check the debug messages in the logging buffer.

## Examples

The following is sample to open lldp debug switches:

```
Switch# debug lldp all
```

## Related Commands

terminal monitor

show logging buffer

# 15.8.17 show lldp local

## Command Purpose

To display the LLDP local information, use the show lldp local command in privileged EXEC mode.

## Command Syntax

show lldp local ( config | tlv-info ) ( interface *IFNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| config | Configuration Information | - |
| tlv-info | Local LLDP TLV information | - |
| interface | Display LLDP configuration or tlv information of special interface | - |

| | | |
|---|---|---|
| IFNAME | Interface name , only allowed physical interface | Support physical ports |

## Command Mode

Privileged EXEC

## Default

None

## Usage

If interface is not specified, this command will display the global information of LLDP.

## Examples

The following example shows how to display LLDP configuration:

```
Switch# show lldp local config
LLDP global configuration:
============================================================
LLDP function global enabled : NO
LLDP msgTxHold     : 4
LLDP msgTxInterval : 30
LLDP reinitDelay   : 2
LLDP txDelay       : 2
Switch# show lldp local config interface eth-0-4
LLDP configuration on interface eth-0-4 :
============================================================
LLDP admin status : Disabled
Basic optional TLV Enabled:
    Port Description TLV
    System Name TLV
    System Description TLV
    System Capabilities TLV
    Management Address TLV
IEEE 802.1 TLV Enabled:
    Port Vlan ID TLV
    Port and Protocol Vlan ID TLV
    Vlan Name TLV
    Protocol Identity TLV
IEEE 802.3 TLV Enabled:
    MAC/PHY Configuration/Status TLV
    Power Via MDI TLV
    Link Aggregation TLV
    Maximum Frame Size TLV
```

```
LLDP-MED TLV Enabled:
    Med Capabilities TLV
    Network Policy TLV
    Extended Power-via-MDI TLV
    Inventory TLV
```

## Related Commands

lldp enable(global)

lldp enable(interface)

lldp tlv basic

lldp tlv med

lldp tlv 8023-org-specific

lldp tlv 8021-org-specific

lldp msg-tx-hold

lldp timer msg-tx-interval

lldp timer reinitDelay

lldp timer tx-delay

# 15.8.18 show lldp neighbor

## Command Purpose

To display LLDP neighbor information, use the show lldp neighbor command in privileged EXEC mode.

## Command Syntax

show lldp neighbor ( interface *IFNAME* | ) ( brief | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| interface | Display LLDP neighbor information of special interface | - |
| IFNAME | Interface name , only allowed physical interface | Support physical ports |
| brief | Display brief information | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

This command is used to display the LLDP neighbor information.

## Examples

The following example shows how to display LLDP neighbor information:

```
Switch# show lldp neighbor interface eth-0-4 brief
Local Port  : eth-0-4
Remote Port : eth-0-6
Hold Time   : 120
Expire Time : 116
System Name : switch
------------------------------------------------------------
```

## Related Commands

lldp enable(global)

lldp enable(interface)

# 15.8.19 show lldp statistics

## Command Purpose

To display the statistics of LLDP packets, use the show lldp statistics command in privileged EXEC mode.

## Command Syntax

show lldp statistics ( interface *IFNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| interface | Display LLDP statistics of special interface | - |
| IFNAME | Interface name , only allowed physical interface | Support physical ports |

## Command Mode

Privileged EXEC

## Default

None

## Usage

This command is used to display detail LLDP statistics.

## Examples

The following example shows how to display LLDP statistics:

```
Switch# show lldp statistics interface eth-0-4
LLDP statistics information:
============================================================
LLDP Port statistics for eth-0-4
Frames transmitted: 568
Frames Aged out: 0
Frames Discarded: 0
Frames with Error: 0
Frames Recieved: 364
TLVs discarded: 0
TLVs unrecognized: 0
```

## Related Commands

clear lldp statistics

# 15.8.20 clear lldp statistics

## Command Purpose

To reset the statistics of LLDP packets , use the clear lldp statistics command in privileged EXEC mode.

### Command Syntax

clear lldp statistics ( interface *IFNAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| interface | Clear LLDP statistics of special interface | - |
| IFNAME | Interface name , only allowed physical interface | Support physical ports |

### Command Mode

Privileged EXEC

### Default

None

### Usage

This command is used to reset LLDP statistics.

### Examples

The following example shows how to clear LLDP statistics:

```
Switch# clear lldp statistics
```

### Related Commands

show lldp statistics

## 15.9 IPFIX Commands

### 15.9.1 ipfix recorder

### Command Purpose

Use this command to create a ipfix recorder and enter recorder configure mode. To remove the ipfix recorder, use the no form of this command.

## Command Syntax

ipfix recorder *NAME*

no ipfix recorder *NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | ipfix recorder name | Up to 32 characters |

## Command Mode

Global Configuration

## Default

None

## Usage

If ipfix recorder has existed，it will enter IPFIX recorder Configuration；if ipfix recorder is new，it will create a recorder and enter IPFIX recorder Configuration；this command should work with the commands of match and collect.

## Examples

This example shows how to create ipfix recorder recorder1in global configuration and enter IPFIX recorder Configuration:

```
Switch# configure terminal
Switch(config)# ipfix recorder recorder1
Switch(Config-ipfix-reocrder)#
Delete ipfix recorder recorder1:
Switch(config)# no ipfix recorder recorder1

Switch# configure terminal
Switch(config)# no ipfix recorder recorder1
```

## Related Commands

decription

match ipv4

match ipv6

match mpls

match transport

collect ttl

collect flow

collect counter

## 15.9.2 description

### Command Purpose

This command used to describe ipfix recorder，use the no form of this command to delete this description.

### Command Syntax

description *DESCRIPTION*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DESCRIPTION | ipfix monitor description | The length of ipfix monitor description should not exceed 64 characters |

### Command Mode

IPFIX recorder Configuration

### Default

None

### Usage

None

### Examples

This example shows how to describe recorder in IPFIX recorder Configuration:

```
Switch# configure terminal
Switch(config)# ipfix recorder recorder1
Switch(Config-ipfix-reocrder)# descrption this is a ipfix recorder
```

This example shows how to delete the description of the recorder:

```
Switch# configure terminal
Switch(config)# ipfix recorder recorder1
Switch(Config-ipfix-reocrder)# no description
```

### Related Commands

None

## 15.9.3 match ipv4

### Command Purpose

This command configures the fields of ipv4 in ipfix recorder, use the no form of this command to delete this configure.

### Command Syntax

match ipv4 ( source | destination ) address ( mask *IP_MASK_LEN* | )

match ipv4 （dscp | ecn | ttl）

no match ipv4 （source | destination）address

no match ipv4 （dscp | ecn | ttl）

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| source | ipv4 source ipaddress | - |
| destination | ipv4 destination ipaddress | - |
| dscp | ipv4 dscp value | - |
| ecn | ipv4 ecn value | - |
| ttl | ipv4 ttl value | - |
| IP_MASK_LEN | mask length for ipv4 address | 1-32 |

### Command Mode

IPFIX recorder Configuration

## Default

Default value is 32

## Usage

None

## Examples

This example shows how to configure to use ipv4 source address and ipv4 destination address in ipfix recorder:

```
Switch# configure terminal
Switch(config)# ipfix recorder recorder1
Switch(Config-ipfix-reocrder)# match ipv4 source address

Switch# configure terminal
Switch(config)# ipfix recorder recorder1
Switch(Config-ipfix-reocrder)#  match ipv4 destination address
```

## Related Commands

None

# 15.9.4 match ipv6

## Command Purpose

This command configures the fields of ipv6 in ipfix recorder, use the no form of this command to delete this configure.

## Command Syntax

match ipv6 ( source | destination ) address ( mask *IPV6_MASK_LEN* | )

no match ipv6（source | destination）address

match ipv6（flowlabel | dscp）

no match ipv6（flowlabel | dscp）

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| source | ipv6 source ipaddress | - |
| destination | ipv4 destination ipaddress | - |
| dscp | ipv6 dscp value | - |
| flowlabel | ipv6 flowlabel value | - |
| IPV6_MASK_LEN | mask length for ipv6 address | range is 1-128 and must be the multiple of 4 |

## Command Mode

IPFIX recorder Configuration

## Default

Default value is 128

## Usage

None

## Examples

This example shows how to configure to use ipv6 source address and ipv6 destination address in ipfix recorder:

```
Switch# configure terminal
Switch(config)# ipfix recorder recorder1
Switch(Config-ipfix-reocrder)# match ipv6 source address

Switch# configure terminal
Switch(config)# ipfix recorder recorder1
Switch(Config-ipfix-reocrder)# match ipv6 destination address
```

## Related Commands

None

## 15.9.5 match mac

### Command Purpose

this command configures the fields of mac in ipfix recorder, use the no form of this command to delete this configure.

### Command Syntax

match mac （destination | source） address

no match mac （destination | source）address

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| source | Source mac address | - |
| destination | Destination mac address | - |

### Command Mode

IPFIX recorder Configuration

### Default

None

### Usage

None

### Examples

This example shows how to configure to use source mac address in ipfix recorder:

```
Switch# configure terminal
Switch(config)# ipfix recorder recorder1
Switch(Config-ipfix-reocrder)# match mac source address
```

### Related Commands

None

## 15.9.6 match transport

### Command Purpose

This command configures the fields of transport in ipfix recorder, use the no form of this command to delete this configure.

### Command Syntax

match transport（destination-port | source-port | type）

no match transport（destination-port | source-port | type）

match transport icmp（opcode | type）

no match transport icmp（opcode | type）

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| destination-port | Destination port | - |
| source-port | Source port | - |
| type | Transport layer type | - |
| opcode | Icmp operated code | - |
| type | ICMP type | - |

### Command Mode

IPFIX recorder Configuration

### Default

None

### Usage

None

### Examples

This example shows how to configure to use source port and destination port of transport in ipfix recorder:

```
Switch# configure terminal
Switch(config)# ipfix recorder recorder1
Switch(Config-ipfix-reocrder)# match transport source-port

Switch# configure terminal
Switch(config)# ipfix recorder recorder1
Switch(Config-ipfix-reocrder)# match transport destination-port
```

### Related Commands

None

## 15.9.7 match vlan

### Command Purpose

This command configures the fields of vlan in ipfix recorder, use the no form of this command to delete this configure.

### Command Syntax

match vlan（inner | ）

no match vlan（inner | ）

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| inner | Inner VLAN | - |

### Command Mode

IPFIX recorder Configuration

### Default

None

### Usage

None

## Examples

This example shows how to configure to use inner vlan in ipfix recorder:

```
Switch# configure terminal
Switch(config)# ipfix recorder recorder1
Switch(Config-ipfix-reocrder)# match vlan inner
```

## Related Commands

None

# 15.9.8 match cos

## Command Purpose

This command configures the fields of cos in ipfix recorder, use the no form of this command to delete this configure.

## Command Syntax

match cos（inner | ）

no match cos（inner | ）

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| inner | Inner COS | - |

## Command Mode

IPFIX recorder Configuration

## Default

None

## Usage

None

## Examples

This example shows how to configure to use inner cos in ipfix recorder:

```
Switch# configure terminal
Switch(config)# ipfix recorder recorder1
Switch(Config-ipfix-reocrder)# match cos inner
```

## Related Commands

None

# 15.9.9 match interface (input | output)

## Command Purpose

This command configures the fields of interface in ipfix recorder, use the no form of this command to delete this configure.

## Command Syntax

match interface ( input | output )

no match interface ( input | output )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| input | input direction | - |
| output | output direction | - |

## Command Mode

IPFIX recorder Configuration

## Default

None

## Usage

None

### Examples

This example shows how to configure input direction in ipfix recorder:

```
Switch# configure terminal
Switch(config)# ipfix recorder recorder1
Switch(Config-ipfix-reocrder)# match interface input
```

### Related Commands

None

## 15.9.10 match vxlan-vni

### Command Purpose

This command configures the fields of vxlan-vni in ipfix recorder, use the no form of this command to delete this configure.

### Command Syntax

match vxlan-vni

no match vxlan-vni

### Command Mode

IPFIX recorder Configuration

### Default

None

### Usage

None

### Examples

This example shows how to configure to use vxlan-vni in ipfix recorder:

```
Switch# configure terminal
Switch(config)# ipfix recorder recorder1
Switch(Config-ipfix-reocrder)# match vxlan-vni
```

### Related Commands

None

## 15.9.11 match nvgre-key

### Command Purpose

This command configures the fields of nvgre-key in ipfix recorder, use the no form of this command to delete this configure.

### Command Syntax

match nvgre-key

no match nvgre-key

### Command Mode

IPFIX recorder Configuration

### Default

None

### Usage

None

### Examples

This example shows how to configure to use nvgre-key in ipfix recorder:

```
Switch# configure terminal
Switch(config)# ipfix recorder recorder1
Switch(Config-ipfix-reocrder)# match nvgre-key
```

## Related Commands

None

# 15.9.12 match transport tcp flags

## Command Purpose

This command configures the tcp flags fields of packet in ipfix recorder, use the no form of this command to delete this configure.

## Command Syntax

match transport tcp flags ( { ack | cwr | ece | fin | psh | rst | syn | urg } | )

no match transport tcp flags ( { ack | cwr | ece | fin | psh | rst | syn | urg } | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ack | TCP acknowledgement | - |
| cwr | TCP congestion window reduced | - |
| ece | TCP Explicit Notification Congestion echo | - |
| fin | TCP finish | - |
| psh | TCP push | - |
| rst | TCP reset | - |
| syn | TCP synchronize | - |
| urg | TCP urgent | - |

## Command Mode

IPFIX recorder Configuration

## Default

None

## Usage

None

## Examples

This example shows how to configure to use tcp flags:

```
Switch# configure terminal
Switch(config)# ipfix recorder recorder1
Switch(Config-ipfix-reocrder)# match transport tcp flags ack
```

## Related Commands

None

# 15.9.13 match packet (drop | non-drop)

## Command Purpose

This command configures the fields of packet in ipfix recorder, use the no form of this command to delete this configure.

## Command Syntax

match packet ( drop | non-drop )

no match packet ( drop | non-drop )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| drop | Drop packet | - |
| non-drop | Non-drop packet | - |

## Command Mode

IPFIX recorder Configuration

## Default

None

## Usage

None

## Examples

This example shows how to configure to use drop packet:

```
Switch# configure terminal
Switch(config)# ipfix recorder recorder1
Switch(Config-ipfix-reocrder)# match packet drop
```

## Related Commands

None

# 15.9.14 collect counter

## Command Purpose

this command configures byte number and packet number that needed to be collected in ipfix recorder, use the no form of this command to delete this configure.

## Command Syntax

collect counter （bytes | packets）

no collect counter（bytes | packets）

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| bytes | Collect flow with byte number | - |
| packets | Collect flow with packet number | - |

## Command Mode

IPFIX recorder Configuration

## Default

None

## Usage

None

## Examples

This example shows how to configure to collect the number of flow's byte in ipfix recorder:

```
Switch# configure terminal
Switch(config)# ipfix recorder recorder1
Switch(Config-ipfix-reocrder)# collect counter bytes
```

## Related Commands

None

# 15.9.15 collect flow

## Command Purpose

This command configures to collect ipfix flow information in ipfix recorder, use the no form of this command to delete this configure.

## Command Syntax

collect flow ( drop | destination | fragmentation )

no collect flow ( drop | destination | fragmentation )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| drop | Only collect the droped flows | - |
| destination | Collect destination address of flows | - |
| fragmentation | Only collect the fragmented flows | - |

## Command Mode

IPFIX recorder Configuration

## Default

None

## Usage

None

## Examples

This example shows how to configure to collect the destination address of flows in ipfix recorder:

```
Switch# configure terminal
Switch(config)# ipfix recorder recorder1
Switch(Config-ipfix-reocrder)# collect flow destination
```

## Related Commands

None

# 15.9.16 collect ttl

## Command Purpose

This command configures to collect ipfix flow information about ttl in ipfix recorder, use the no form of this command to delete this configure.

## Command Syntax

collect ttl ( maximum | minimum | changed | )

no collect ttl ( maximum | minimum | changed | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| maximum | Collect flow max ttl value | - |
| minimum | Collect flow min ttl value | - |
| changed | Collect flow ttl changed history | - |

### Command Mode

IPFIX recorder Configuration

### Default

None

### Usage

None

### Examples

This example shows how to configure to collect the maximum ttl and minimum ttl of the flows in ipfix recorder:

```
Switch# configure terminal
Switch(config)# ipfix recorder recorder1
Switch(Config-ipfix-reocrder)# collect ttl maximum
Switch(Config-ipfix-reocrder)# collect ttl minimum
```

### Related Commands

None

## 15.9.17 collect timestamp

### Command Purpose

This command configures to collect ipfix flow information about timestamp in ipfix recorder, use the no form of this command to delete this configure.

### Command Syntax

collect timestamp ( first | last )

no collect timestamp ( first | last )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| first | Collect flow start timestamp | - |

| | | |
|---|---|---|
| last | Collect flow end timestamp | - |

## Command Mode

IPFIX recorder Configuration

## Default

None

## Usage

None

## Examples

This example shows how to configure to collect the timestamp of the flows in ipfix recorder:

```
Switch# configure terminal
Switch(config)# ipfix recorder recorder1
Switch(Config-ipfix-reocrder)# collect timestamp  first
```

## Related Commands

None

# 15.9.18 ipfix exporter

## Command Purpose

Use this command to create a ipfix exporter and enter exporter configure mode.

To remove the ipfix exporter, use the no form of this command.

## Command Syntax

ipfix exporter *NAME*

no ipfix exporter *NAME*

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| NAME | ipfix exporter name | Up to 32 characters |

## Command Mode

Global Configuration

## Default

None

## Usage

If ipfix exporter has existed，it will enter IPFIX exporter Configuration；if ipfix exporter is new，it will create exporter and enter IPFIX exporter Configuration；this command should work with the other commands .

## Examples

This example shows how to create ipfix exporter exporter1in global configuration and enter IPFIX exporter Configuration:

```
Switch# configure terminal
Switch(config)# ipfix exporter exporter1
Switch(Config-ipfix-exporter)#
```

This example shows how to delete ipfix exporter exporter1:

```
Switch# configure terminal
Switch(config)# no ipfix exporter exporter1
```

## Related Commands

template data timeout

flow data timeout

event flow start

event flow end (tcp-end|timeout)

transport protocol (udp|tcp)

# 15.9.19 description

## Command Purpose

This command used to describe ipfix exporter，use the no form of this command to delete this description.

## Command Syntax

description *DESCRIPTION*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DESCRIPTION | Ipfix exporter description | Up to 64 characters |

## Command Mode

IPFIX exporter Configuration

## Default

None

## Usage

None

## Examples

```
Switch# configure terminal
Switch(config)# ipfix exporter exporter1
Switch(Config-ipfix-exporter)# descrption this is a ipfix exporter

Switch# configure terminal
Switch(config)# ipfix exporter exporter1
Switch(Config-ipfix-exporter)# no description
```

## Related Commands

None

# 15.9.20 destination

## Command Purpose

This command used to configure collecter host name that need to receive flow records in ipfix exporter , use the no form of this command to delete this description.

## Command Syntax

destination *HOST*

no destination *HOST*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| HOST | The length of host name should not exceed 32 characters | Up to 32 characters |

## Command Mode

IPFIX exporter Configuration

## Default

None

## Usage

If you use host as destination of exporter, the host will be resolved immediately and the ip address is stored.If the host-ip mappding changes dynamically, exporter does not detect this. It will continue to send packets to original IP address.

## Examples

This example shows how to configure destination as host1 in IPFIX exporter's Configuration:

```
Switch# configure terminal
Switch(config)# ipfix exporter exporter1
Switch(Config-ipfix-exporter)# destination host1
```

## Related Commands

None

# 15.9.21 dscp

## Command Purpose

this command used to configure the dscp value of the message that need to be sended in ipfix exporter , use the no form of this command to delete this description.

## Command Syntax

dscp *DSCP*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DSCP | dscp value | 0-63 |

## Command Mode

IPFIX exporter Configuration

## Default

None

## Usage

None

## Examples

This example shows how to configure dscp to be 20 in IPFIX exporter Configuration:

```
Switch# configure terminal
Switch(config)# ipfix exporter exporter1
Switch(Config-ipfix-exporter)# dscp 20
```

## Related Commands

None

# 15.9.22 domain-id

## Command Purpose

This command used to configure the ipfix domain value of the message that needs to be sent in ipfix exporter, use the no form of this command to delete this description.

## Command Syntax

domain-id *ID*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ID | domain id | 1-65535 |

## Command Mode

IPFIX exporter Configuration

## Default

None

## Usage

None

## Examples

This example shows how to configure domain-id to be 1000 in IPFIX exporter Configuration:

```
Switch# configure terminal
Switch(config)# ipfix exporter exporter1
Switch(Config-ipfix-exporter)# domain-id 1000
```

### Related Commands

None

## 15.9.23 source interface

### Command Purpose

This command used to configure which interface should send ipfix record in ipfix exporter，use the no form of this command to delete this description.

### Command Syntax

source interface interface-number

no source interface-number

### Command Mode

IPFIX exporter Configuration

### Default

None

### Usage

None

### Examples

This example shows how to configure use interface eth-0-1 to send ipfix records in IPFIX exporter Configuration:

```
Switch# configure terminal
Switch(config)# ipfix exporter exporter1
Switch(Config-ipfix-exporter)# source interface eth-0-1
```

### Related Commands

None

# 15.9.24 template data timeout

## Command Purpose

This command used to configure time interval of sending template data in ipfix exporter，use the no form of this command to delete this description.

## Command Syntax

template data timeout *TIMEOUT*

no template data timeout

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| TIMEOUT | template data timeout | 1-86400 |

## Command Mode

IPFIX exporter Configuration

## Default

600

## Usage

None

## Examples

This example shows how to configure time interval of sending template data to be 200 seconds in IPFIX exporter Configuration:

```
Switch# configure terminal
Switch(config)# ipfix exporter exporter1
Switch(Config-ipfix-exporter)# template data timeout 200
```

## Related Commands

None

## 15.9.25 flow data timeout

### Command Purpose

This command used to configure time interval of sending flow data in ipfix exporter, use the no form of this command to delete this description.

### Command Syntax

flow data timeout *TIMEOUT*

no flow data timeout

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| TIMEOUT | flow data timeout | 1-86400 |

### Command Mode

IPFIX exporter Configuration

### Default

600

### Usage

None

### Examples

This example shows how to configure time interval of sending flow data to be 200 seconds in IPFIX exporter Configuration:

```
Switch# configure terminal
Switch(config)# ipfix exporter exporter1
Switch(Config-ipfix-exporter)# flow data timeout 200
```

### Related Commands

None

# 15.9.26 transport protocol

## Command Purpose

This command used to configure to use which transport when send message in ipfix exporter，use the no form of this command to delete this description.

## Command Syntax

transport protocol udp port *UDP_PORT*

no transport protocol

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| UDP_PORT | transport protocol number | Range is 2000 to 65535，Default is 2055 |

## Command Mode

IPFIX exporter Configuration

## Default

2055

## Usage

None

## Examples

This example shows how to configure transport protocol of flow data sended to be udp and its port is 3500 in IPFIX exporter Configuration:

```
Switch# configure terminal
Switch(config)# ipfix exporter exporter1
Switch(Config-ipfix-exporter)# transport protocol udp 3500
```

## Related Commands

None

## 15.9.27 ttl

### Command Purpose

This command used to configure the ttl of the sended message in ipfix exporter, use the no form of this command to delete this description.

### Command Syntax

ttl *TTL*

no ttl

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| TTL | TTL value | 1-255 |

### Command Mode

IPFIX exporter Configuration

### Default

None

### Usage

None

### Examples

This example shows how to configure ttl value of flow data to be 255 in IPFIX exporter Configuration:

```
Switch# configure terminal
Switch(config)# ipfix exporter exporter1
Switch(Config-ipfix-exporter)# ttl 255
```

### Related Commands

None

# 15.9.28 event flow

## Command Purpose

This command used to configure which event should triggle to send flow information at once in ipfix exporter, use the no form of this command to delete this description.

## Command Syntax

event flow start

no event flow start

event flow end ( tcp-end | timeout )

no event flow end ( tcp-end | timeout )

## Command Mode

IPFIX exporter Configuration

## Default

None

## Usage

None

## Examples

This example shows how to configure the event about ending tcp transmission of flow data will triggle to send flow information in IPFIX exporter Configuration:

```
Switch# configure terminal
Switch(config)# ipfix exporter exporter1
Switch(Config-ipfix-exporter)# event flow tcp-end
```

## Related Commands

None

# 15.9.29 ipfix sampler

## Command Purpose

Use this command to create a ipfix sampler and enter sampler configure mode.

To remove the ipfix sampler, use the no form of this command.

## Command Syntax

ipfix sampler *NAME*

no ipfix sampler *NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | ipfix sampler name | Up to 32 characters |

## Command Mode

Global Configuration

## Default

None

## Usage

If ipfix sampler has existed，it will enter IPFIX sampler Configuration；if ipfix sampler is new，it will create sampler and enter IPFIX sampler Configuration；this command should work with the command of match and collect.

## Examples

This example shows how to create ipfix sampler sampler1 in global configuration and enter IPFIX sampler Configuration:

```
Switch# configure terminal
Switch(config)# ipfix sampler sampler 1
Switch(Config-ipfix-sampler)#
```

This example shows how to delete ipfix sampler sampler1:

```
Switch# configure terminal
Switch(config)# no ipfix sampler sampler1
```

### Related Commands

1 out-of

## 15.9.30 description

### Command Purpose

This command used to describe ipfix sampler，use the no form of this command to delete this description.

### Command Syntax

description *DESCRIPTION*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DESCRIPTION | ipfix sampler description | Up to 64 characters |

### Command Mode

IPFIX sampler Configuration

### Default

None

### Usage

None

### Examples

```
Switch# configure terminal
Switch(config)# ipfix sampler sampler 1
Switch(Config-ipfix-sampler)# descrption this is a ipfix sampler

Switch# configure terminal
Switch(config)# ipfix sampler sampler 1
Switch(Config-ipfix-sampler)# no description
```

## Related Commands

None

# 15.9.31 1 out-of

## Command Purpose

This command used to configure the rate of ipfix sampler，use the no form of this command to delete this configure.

## Command Syntax

1 out of *CLI_IPFIX_SAMPLER_RATE_RNG*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| CLI_IPFIX_SAMPLER_RATE_RNG | How many packets will sample one packet | 1-65535 |

## Command Mode

IPFIX sampler Configuration

## Default

None

## Usage

None

## Examples

This example shows how to configure the rate of sampling is 1/100 in IPFIX sampler Configuration:

```
Switch# configure terminal
Switch(config)# ipfix sampler sampler 1
Switch(Config-ipfix-sampler)# 1 out of 100
```

## Related Commands

None

# 15.9.32 ipfix monitor (global)

## Command Purpose

Use this command to create a ipfix monitor and enter monitor configure mode. To remove the ipfix monitor, use the no form of this command.

## Command Syntax

ipfix monitor *NAME*

no ipfix monitor *NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | ipfix monitor name | Up to 32 characters |

## Command Mode

Global Configuration

## Default

None

## Usage

None

## Examples

This example shows how to create ipfix recorder recorder1in global configuration and enter IPFIX recorder Configuration:

```
Switch# configure terminal
Switch(config)# ipfix monitor monitor1
Switch(Config-ipfix-monitor)#
```

This example shows how to delete ipfix monitor monitor1:

```
Switch# configure terminal
Switch(config)# no ipfix monitor monitor1
```

### Related Commands

recorder

exporter

## 15.9.33 description

### Command Purpose

This command used to describe ipfix monitor，use the no form of this command to delete this description.

### Command Syntax

description *DESCRIPTION*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DESCRIPTION | The length of ipfix monitor description should not exceed 64 characters | Up to 64 characters |

### Command Mode

IPFIX monitor Configuration

### Default

None

### Usage

None

### Examples

Add descriptoin for IPFIX monitor:

```
Switch# configure terminal
Switch(config)# ipfix monitor monitor1
Switch(Config-ipfix-monitor)# descrption this is a ipfix monitor
```

Remove description:

```
Switch# configure terminal
Switch(config)# ipfix monitor monitor1
Switch(Config-ipfix-monitor)# no description
```

### Related Commands

None

## 15.9.34 recorder

### Command Purpose

Use this command to create a ipfix recorder of the ipfix monitor. To remove the ipfix monitor, use the no form of this command.

### Command Syntax

recorder *NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | ipfix recorder name | Up to 32 characters |

### Command Mode

IPFIX monitor Configuration

### Default

None

### Usage

None

### Examples

This example shows how to create a recorder of the ipfix monitor configure mode:

```
Switch# configure terminal
Switch(config)# ipfix monitor monitor1
Switch(Config-ipfix-monitor)# recorder recorder1
```

### Related Commands

None

## 15.9.35 exporter

### Command Purpose

Use this command to create a ipfix exporter of the ipfix monitor. To remove the ipfix monitor, use the no form of this command.

### Command Syntax

exporter *NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | ipfix exporter name | Up to 32 characters |

### Command Mode

IPFIX monitor Configuration

### Default

None

### Usage

None

### Examples

This example shows how to create a exporter of the ipfix monitor configure mode:

```
Switch# configure terminal
Switch(config)# ipfix monitor monitor1
Switch(Config-ipfix-monitor)# exporter exporter1
```

## Related Commands

None

# 15.9.36 flow mirror

## Command Purpose

Use this command to create a ipfix flow mirror of the ipfix monitor. To remove flow mirror of the ipfix monitor, use the no form of this command.

## Command Syntax

flow mirror packet *CLI_IPFIX_MIRROR_COUNT_RNG* monitor to session 1

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| CLI_IPFIX_MIRROR_COUNT_RNG | Packet count value, first count of packet per flow | Range is 1 to 255 |

## Command Mode

IPFIX monitor Configuration

## Default

None

## Usage

None

## Examples

This example shows how to create a flow mirror of the ipfix monitor configure mode:

```
Switch# configure terminal
Switch(config)# ipfix monitor monitor1
Switch(Config-ipfix-monitor)# flow mirror packet 1 monitor to session 1
```

## Related Commands

None

# 15.9.37 ipfix monitor (interface/port-group/vlan group)

## Command Purpose

This command used to enable ipfix.

## Command Syntax

ipfix monitor ( input | output ) *NAME* ( sampler *NAME* | )

no ipfix monitor ( input | output )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| input | do ipfix for the inputed packets | - |
| output | do ipfix for the outputed packets | - |
| NAME | IPFIX monitor name | Up to 32 characters |
| sampler NAME | IPFIX sampler name | Up to 32 characters |

## Command Mode

Interface Configuration

Port-group Configuration

Vlan-group Configuration

## Default

None

## Usage

None

### Examples

This example shows how to enable ipfix:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# ipfix monitor input monitor sampler test-sample
```

### Related Commands

None

## 15.9.38 ipfix global configure

### Command Purpose

this command used to enter ipfix global configure mode.

### Command Syntax

ipfix global

### Command Mode

Global Configuration

### Default

None

### Usage

None

### Examples

This example shows how to enter IPFIX global configure mode.:

```
Switch# configure terminal
Switch(config)# ipfix global
Switch(config-ipfix-global)#
```

## Related Commands

None

# 15.9.39 ipfix global flow

## Command Purpose

this command used to configure ipfix globally.

## Command Syntax

ipfix global flow aging *CLI_IPFIX_AGING_INTVAL_RNG*

flow export *CLI_IPFIX_CACHE_EXPORT_INTVAL_RNG*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| CLI_IPFIX_AGING_INTVAL_RNG | The aging time of the flow | Range is 1 to 65535, the default is 1800 seconds |
| CLI_IPFIX_CACHE_EXPORT_INTVAL_RNG | The interval time of flow being exported from ASIC to OS. | Range is 1 to 1000, the default is 5 seconds |

## Command Mode

IPFIX global configuration

## Default

None

## Usage

None

## Examples

This example shows how to configure the aging time to be 200 seconds in global configure mode:

```
Switch# configure terminal
Switch(config)# ipfix global flow aging 200
```

This example shows how to configure the export interval to be 10 seconds in global configure mode:

```
Switch# configure terminal
Switch(config)# ipfix global
Switch(config-ipfix-global)# flow export 10
```

### Related Commands

None

## 15.9.40 show ipfix recorder

### Command Purpose

Use the show ipfix recorde privileged EXEC command to display the configure information of one ipfix recorder.

### Command Syntax

show ipfix recorder *NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | ipfix recorder name | Up to 32 characters |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to show ipfix recorder command:

```
Switch# show ipfix recorder recorder1
```

## Related Commands

None

# 15.9.41 show ipfix exporter

## Command Purpose

Use the show ipfix exporter privileged EXEC command to display the configure information of one ipfix exporter.

## Command Syntax

show ipfix exporter *NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | ipfix exporter name | Up to 32 characters |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to display configuration about exporter1 in privileged EXEC mode:

```
Switch# show ipfix exporter exporter1
```

## Related Commands

None

# 15.9.42 show ipfix cache

## Command Purpose

This command used to show the state information of the ipfix.

## Command Syntax

show ipfix cache monitor *MNAME*

show ipfix cache observe-point interface ( *IFPHYSICAL* | *IFVLAN* | *IFAGG* ) ( input | output )

show ipfix cache observe-point vlan *"CLI_IPFIX_ALL_VLAN_CLI_RNG"* ( input | output )

show ipfix cache observe-point port-group *PGNAME* ( input | output )

show ipfix cache observe-point vlan-group *VGNAME* ( input | output )

show ipfix cache observe-point cid-pair role-based

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MNAME | ipfix monitor name | Up to 32 characters |
| IFPHYSICAL | Name of interface | Support physical/aggregation/VLAN ports |
| input | input direction | - |
| output | output direction | - |
| CLI_IPFIX_ALL_VLAN_CLI_RNG | vlan id | - |
| PGNAME | Port-group name | - |
| VGNAME | Vlan-group name | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to show the state information of the ipfix on the interface eth-0-1in privileged EXEC mode:

```
Switch# show ipfix cache observe-point interface eth-0-1 input
```

## Related Commands

None

# 15.9.43 show ipfix monitor

## Command Purpose

This command used to describe the configration of the ipfix monitor.

## Command Syntax

show ipfix monitor *NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | ipfix monitor name | Up to 32 characters |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

### Examples

This example shows how to display configuration of monitor 1 in privileged EXEC mode:

```
Switch# show ipfix monitor monitor 1
```

### Related Commands

None

## 15.9.44 show ipfix sampler

### Command Purpose

This command used to describe the configration of the ipfix sampler.

### Command Syntax

show ipfix sampler *NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | ipfix sampler name | Up to 32 characters |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to display configuration of sampler1 in privileged EXEC mode:

```
Switch# show ipfix sampler sampler1
```

### Related Commands

None

## 15.9.45 show resource ipfix

### Command Purpose

This command used to describe the resource of ipfix.

### Command Syntax

show resource ipfix

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to display resource of ipfix in privileged EXEC mode:

```
Switch# show resource ipfix
```

### Related Commands

None

# 15.9.46 clear ipfix cache monitor

## Command Purpose

This command used to clear cache with ipfix monitor name.

## Command Syntax

clear ipfix cache monitor *NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NAME | IPFIX monitor name | Up to 32 characters |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to clear ipfix cache with name test in privileged EXEC mode:

```
Switch# clear ipfix cache monitor test
```

## Related Commands

None

# 15.9.47 clear ipfix cache observe-point interface

## Command Purpose

This command used to clear cache on interface.

## Command Syntax

clear ipfix cache observe-point interface ( *IFNAME* ) ( input | output )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFPHYSICAL | Name of interface | Support physical/aggregation/VLAN ports |
| input | the inputed packets | - |
| output | the outputed packets | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to clear ipfix cache on interface eth-0-1 in privileged EXEC mode:

```
Switch# clear ipfix cache observe-point interface eth-0-1 input
```

## Related Commands

None

# 15.10 Hardware Monitor Commands

## 15.10.1 hardware monitor watermark

### Command Purpose

Use this command to change the recording period of the watermark function. Use the no form of the command to restore the recording period to the default value (30).

### Command Syntax

hardware monitor watermark interval <1-60>

no hardware monitor watermark interval

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| <1-60> | The recording period of watermark functin. Unit: minute(s) | 1-60 |

### Command Mode

Global Configuration

### Default

The default value of recording period is 30 minutes.

### Usage

Watermark function is used to record the biggest buffer usage and biggest time delay of a certain port within a period; this record is periodically.

### Examples

The following example shows how to set the recording period of the watermark function to 2 minutes:

```
Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# hardware monitor watermark interval 2
```

### Related Commands

show hardware monitor watermark interface IFPHYSICAL

## 15.10.2 show hardware monitor watermark interface

### Command Purpose

Use this command to display the maximum buffer cell usage and maximum delay of a port counted by the watermark function in a recording period. Use the clear form of the command to clear statistics on a port.

### Command Syntax

show hardware monitor watermark interface *IFPHYSICAL*

clear hardware monitor watermark interface *IFPHYSICAL*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFPHYSICAL | physical port number | depending on the specific version model |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following example shows how to configure the watermarking function to record statistics on port eth-0-5 at a period of 1 minute:

```
Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# hardware monitor watermark interval 1
```

```
Switch(config)# end
Switch# show hardware monitor watermark interface eth-0-5

Switch# show hardware monitor watermark interface eth-0-5
              Time        Latency  Buffer(total)
-----------------------------------------------------------------------
   Jan 28 07:12:25       16040000          58373
   Jan 28 07:11:25       16032288          58373
```

### Related Commands

None

## 15.10.3 hardware monitor notify server

### Command Purpose

Use this command to configure the IP address and UDP port number of the notification server. Use the no form of the command to delete the configuration.

### Command Syntax

hardware monitor notify server *A.B.C.D* ( port <1-65535> | )

no hardware monitor notify server

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| A.B.C.D | IP address of notify server. | - |
| <1-65535> | UDP port number. | 1-65535 |

### Command Mode

Global Configuration

### Default

The default port number is 20008.

### Usage

After you run this command, the switch sends Buffer Stats Notify、Latency Stats Notify、Buffer Micro-burst Notify or Latency Event Notify packets the server periodically or immediately.

### Examples

The following example show how to set the IP address of the notification server to 192.108.10.2 and UDP port number to 35000:

```
Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# hardware monitor notify server 192.108.10.2 port 35000
```

### Related Commands

None

## 15.10.4 hardware monitor notify interval

### Command Purpose

Use this command to set the interval for sending Notify messages to the Notify server. Use the no form of this command to restore the interval to the default value (60).

### Command Syntax

hardware monitor notify interval <10-300>

no hardware monitor notify interval

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| <10-300> | Interval for sending Notify packets. Unit: second(s) | 10-300 |

### Command Mode

Global Configuration

### Default

The default interval is 60 seconds.

### Usage

None

### Examples

The following shows how to configure the interval to be 30 seconds:

```
Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# hardware monitor notify interval 30
```

### Related Commands

None

## 15.10.5 hardware buffer-monitor notify

### Command Purpose

Use this command to enable the buffer cell statistics notification and congestion event notification functions on the interface. Use the no form of this command to disable the buffer cell statistics notification and congestion event notification function on the interface.

### Command Syntax

hardware buffer-monitor notify

no hardware buffer-monitor notify

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| N/A | N/A | N/A |

### Command Mode

Interface Configuration

## Default

N/A

## Usage

After this function is enabled, the switch periodically sends a Buffer Status Notify message to the notification server. When a congestion event occurs, the switch immediately sends a Buffer Micro-Burst Notify message to the notification server.

## Examples

The following example shows how to enable Buffer Statistics Notification and congestion event notification for port eth-0-9:

```
Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# interface eth-0-9
Switch(config-if)# hardware buffer-monitor notify
```

## Related Commands

None

# 15.10.6 hardware latency-monitor notify

## Command Purpose

Use this command to enable Latency statistics norification and Latency enent notification on the interface. Use the no form of the command to disable latency statistics notification and latency event notification on the interface.

## Command Syntax

hardware latency-monitor notify

no hardware latency-monitor notify

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| N/A | N/A | N/A |

### Command Mode

Interface Configuration

### Default

N/A

### Usage

After this function is enabled, the switch periodically sends Latency Notify packets to the notification server. If a Latency Event occurs, the switch immediately sends Latency Event Notify packets to the notification server.

### Examples

The following example shows how to enable latency statistics notification and latency event notification on port eth-0-9 :

```
Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# interface eth-0-9
Switch(config-if)# hardware latency-monitor notify
```

### Related Commands

None

## 15.10.7 show hardware monitor statistics

### Command Purpose

Use this command to display the number of Latency Interval Notify Messages and Latency Event Notify Messages and Buffer Interval Notify Messages and Buffer Event Notify Messages sent by the switch to the notification server. Use the clear form of the command to clear switch statistics.

### Command Syntax

show hardware monitor statistics

clear hardware monitor statistics

| Parameter | Parameter Description | Parameter Value |
| --- | --- | --- |
| N/A | N/A | N/A |

## Command Mode

Privileged EXEC

## Default

N/A

## Usage

None

## Examples

The following example shows the number of four types of notification messages sent by the switch to the notification server:

```
Switch# show hardware monitor statistics
Notify Statistics:
=====================================
Latency Interval Notify Messages : 0
Latency Event Notify Messages    : 0
Buffer Interval Notify Messages  : 0
Buffer Event Notify Messages     : 0
```

## Related Commands

None

# 15.10.8 hardware buffer-monitor

## Command Purpose

Use this command to enable the congestion monitoring function for a port. Use no form of this command to disable the congestion monitoring function for a port.

## Command Syntax

hardware buffer-monitor enable

no hardware buffer-monitor enable

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| N/A | N/A | N/A |

## Command Mode

Interface Configuration

## Default

N/A

## Usage

None

## Examples

The following example shows how to enable congestion monitoring for port eht-0-9:

```
Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# interface eth-0-9
Switch(config-if)# hardware buffer-monitor enable
```

## Related Commands

None

# 15.10.9 hardware buffer-monitor micro-burst

## Command Purpose

Use this command to enable the congestion event reporting function of the switch. Use no form of this command to disable the switch congestion event reporting function.

## Command Syntax

hardware buffer-monitor micro-burst enable

no hardware buffer-monitor micro-burst enable

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| N/A | N/A | N/A |

## Command Mode

Global Configuration

## Default

N/A

## Usage

None

## Examples

The following example shows how to enable the switch congestion event reporting function:

```
Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# hardware buffer-monitor micro-burst enable
```

## Related Commands

None

# 15.10.10 hardware buffer-monitor micro-burst threshold

## Command Purpose

Use this command to set the high and low threshold for reporting congestion events. Use the no form of this command to restore the high and low threshold to the default value.

## Command Syntax

hardware buffer-monitor micro-burst threshold low <8-16383> high <8-16383>

no hardware buffer-monitor micro-burst threshold

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| <8-16383> | Low threshold for reporting congestion events. Unit: Buffer Cell | 8-16383 |
| <8-16383> | High threshold for reporting congestion events. Unit: Buffer Cell | 8-16383，must be bigger than the value of the low threshold |

## Command Mode

Global Configuration

## Default

The default value of low threshold: 16

The defaulr value of high threshold: 64

## Usage

None

## Examples

The following example shows how to set the low threshold for triggering congestion events to 64 and the high threshold to 16000:

```
Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# hardware buffer-monitor micro-burst threshold low 64 high 16000
```

## Related Commands

None

## 15.10.11 show hardware buffer-monitor status

### Command Purpose

Use this command to display all the configurations related to the buffer monitor on the switch.

### Command Syntax

show hardware buffer-monitor status

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| N/A | N/A | N/A |

### Command Mode

Privileged EXEC

### Default

N/A

### Usage

N/A

### Examples

The following shows all the configuration for the buffer monitor on the switch:

```
Switch# show hardware buffer-monitor status
Hardware buffer micro-burst event: disable
Hardware buffer micro-burst threshold low: 16     high: 64
Port       buffer monitor
--------------------------------------------------------------------------------
eth-0-1    disable
eth-0-2    disable
eth-0-3    disable
eth-0-4    disable
eth-0-5    enable
eth-0-6    disable
eth-0-7    disable
eth-0-8    disable
eth-0-9    enable
```

```
eth-0-10   disable
eth-0-11   disable
eth-0-12   disable
eth-0-13   disable
eth-0-14   disable
eth-0-15   disable
eth-0-16   disable
eth-0-17   disable
eth-0-18   disable
eth-0-19   disable
eth-0-20   disable
```

### Related Commands

None

## 15.10.12 show hardware buffer-monitor interface

### Command Purpose

Use this command to display the number of packets accumulated on a port at a sampling time point (10 milliseconds). Use the clear form of the command to clear the statistics of a port.

The number of records displayed on the terminal.

### Command Syntax

show hardware buffer-monitor interface *IFPHYSICAL* ( | <16-300000> )

clear hardware buffer-monitor interface *IFPHYSICAL*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFPHYSICAL | Phycial port number | Depending on the specific version model |
| (\|<16-300000>) | The number of records displayed on the terminal | 16-300000 |

### Command Mode

Privileged EXEC

### Default

N/A

## Usage

N/A

## Examples

The following shows the top of 20 statistics of eth-0-5:

```
Switch# show hardware buffer-monitor interface eth-0-5 20
Brief CLI issued at : 08:39:15 UTC Fri Jan 28 2022
Flag (micro-burst)  : S - Start record     E - End record     U - Update record
Flag Time                 Total count
-------------------------------------------------------
-    08:39:11.698066906   58368
-    08:39:11.688067287   58367
-    08:39:11.678067668   58365
-    08:39:11.668068049   58366
-    08:39:11.658068430   58369
-    08:39:11.648068811   58368
-    08:39:11.638069192   58367
-    08:39:11.628069573   58366
-    08:39:11.618069954   58370
-    08:39:11.608070335   58367
-    08:39:11.598070716   58368
-    08:39:11.588071097   58369
-    08:39:11.578071478   58368
-    08:39:11.568071859   58367
-    08:39:11.558072240   58367
-    08:39:11.548072621   58369
-    08:39:11.538073002   58366
-    08:39:11.528073383   58368
-    08:39:11.518073764   58369
-    08:39:11.508074145   58369
```

## Related Commands

None

# 15.10.13 show hardware buffer-monitor micro-burst interface

## Command Purpose

Use this command to view congestion events on a port. Use the clear form of the command to clear statistics on a port.

## Command Syntax

show hardware buffer-monitor micro-burst interface *IFPHYSICAL*

clear hardware buffer-monitor micro-burst interface *IFPHYSICAL*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFPHYSICAL | Physical port number | Depending on the specific version model |

## Command Mode

Privileged EXEC

## Default

N/A

## Usage

N/A

## Examples

The following shows congestion event statistics on port eth-0-5:

```
Switch# show hardware buffer-monitor micro-burst interface eth-0-5
Brief CLI issued at : 09:20:11 UTC Fri Jan 28 2022
Flag (micro-burst)  : S - Start record     E - End record
Flag Time(ns)             Total count          Threshold level
-------------------------------------------------------------------
E    09:20:06.892459921   15                   0
S    09:19:05.087003316   64                   0
```

## Related Commands

None

# 15.10.14 hardware latency-monitor

## Command Purpose

Use this command to enable the latency monitoring function for a port. Use no form of this command to disable the latency monitoring function for a port.

## Command Syntax

hardware latency-monitor enable

no hardware latency-monitor enable

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| N/A | N/A | N/A |

## Command Mode

Interface Configuration

## Default

N/A

## Usage

N/A

## Examples

The following example shows how to enable the delay monitoring function for port eth-0-9:

```
DUT1# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
DUT1(config)# interface eth-0-9
DUT1(config-if)# hardware latency-monitor enable
```

## Related Commands

None

# 15.10.15 hardware latency-monitor threshold event

## Command Purpose

Use this command to set the threshold for reporting the triggering delay event on a port. Use the no form of this command to restore the threshold to the default value.

## Command Syntax

hardware latency-monitor threshold event low <64-2147483647> high <64-2147483647>

no hardware latency-monitor threshold event

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| <64-2147483647> | Low threshold for triggering delayed event reporting. Unit: ns | 64-2147483647 |
| <64-2147483647> | High threshold for triggering delayed event reporting. Unit: ns | 64-2147483647 |

## Command Mode

Global Configuration

## Default

The default value of low threshold: 768

The defaulr value of high threshold: 3072

## Usage

The value of the high or low threshold must be an integer multiple of 64. If the dalay time of a packet is higher than the upper threshold, the switch reports a delay start event. If the delay event of the packet is higher than the high threshold and lower than the low threshold, the switch reports a delay end event. Before running this command, you need to enable the delay monitoring function of the port.

## Examples

The following example shows how to set the global low threshold for reporting congestion events and the global high threshold to 64000ns:

```
DUT1# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
DUT1(config)# hardware latency-monitor threshold event low 640 high 64000
```

## Related Commands

None

# 15.10.16 hardware latency-monitor range

## Command Purpose

Use this command to configure eight delay intervals. Use the no form of the command to restore the dalay interval to the default value.

## Command Syntax

hardware latency-monitor range <1-4261412864> <1-4261412864> <1-4261412864> <1-4261412864> <1-4261412864> <1-4261412864> <1-4261412864>

no hardware latency-monitor range

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| <1-4261412864> | the value of latency range 1 | 1-4261412864. Unit: ns. It must be integer multiple of 64. |
| <1-4261412864> | the value of latency range 2 | 1-4261412864. Unit: ns. It must be integer multiple of 64 and greater than interval 1 |
| <1-4261412864> | the value of latency range 3 | 1-4261412864. Unit: ns. It must be integer multiple of 64 and greater than interval 2 |
| <1-4261412864> | the value of latency range 4 | 1-4261412864. Unit: ns. It must be integer multiple of 64 and greater than interval 3 |

| | | |
|---|---|---|
| <1-4261412864> | the value of latency range 5 | 1-4261412864. Unit: ns. It must be integer multiple of 64 and greater than interval 4 |
| <1-4261412864> | the value of latency range 6 | 1-4261412864. Unit: ns. It must be integer multiple of 64 and greater than interval 5 |
| <1-4261412864> | the value of latency range 7 | 1-4261412864. Unit: ns. It must be integer multiple of 64 and greater than interval 6 |

## Command Mode

Global Configuration

## Default

the default value of latency range 1: 1-448

the default value of latency range 2: 448-768

the default value of latency range 3: 768-1152

the default value of latency range 4: 1152-1536

the default value of latency range 5: 1536-2048

the default value of latency range 6: 2048-3072

the default value of latency range 7: 3072-5120

the default value of latency range 8: 5120-infinity

## Usage

None

## Examples

The following example shows how to set the eight delay ranges to 1-640，640-3200，3200-6400，6400-12800，12800-25600，25600-128000，128000-256000，256000-infinity:

```
Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# hardware latency-monitor range 640 3200 6400 12800 25600 128000
256000
```

### Related Commands

None

## 15.10.17 hardware latency-monitor drop

### Command Purpose

Use this command to enable the packet discarding function for a port with high forwarding delay. Use the no form of the command to disable this function.

### Command Syntax

hardware latency-monitor drop

no hardware latency-monitor drop

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| N/A | N/A | N/A |

### Command Mode

Interface Configuration

### Default

None

### Usage

None

### Examples

The following shows how to enable the packet discarsion function with high forwarding delay on port eth-0-9:

```
Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# interface eth-0-9
Switch(config-if)# hardware latency-monitor drop
```

### Related Commands

hardware latency-monitor threshold drop

## 15.10.18 hardware latency-monitor threshold drop

### Command Purpose

Use this command to set the threshold for the port to discard packets with high forwarding delay. Use the no form of this command to restore it to the default value.

### Command Syntax

hardware latency-monitor threshold drop <2-8>

no hardware latency-monitor threshold drop

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| <2-8> | Discard threshold. Unit: delay interval | 2-8 |

### Command Mode

Interface Configuration

### Default

The default value of the discard threshold is 8. That is, packets whose forwarding delay reaches the eighth delay range are discard.

### Usage

Before using this command, you need to enable the function of discarding packets with high forwarding delay on the port.

### Examples

The following shows how to configure port eth-0-9 to discard the packets whose forwarding delay is in the sixth delay range:

```
Switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)# interface eth-0-9
Switch(config-if)# hardware latency-monitor threshold drop 6
```

### Related Commands

hardware latency-monitor range

## 15.10.19 show hardware latency-monitor status

### Command Purpose

Use this command to display all configurations related to latency monitor on the switch.

### Command Syntax

show hardware latency-monitor status

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| N/A | N/A | N/A |

### Command Mode

Privileged EXEC

### Default

N/A

### Usage

N/A

## Examples

The following shows all the configurations for latency monitor on the switch.:

```
Switch# show hardware latency-monitor status
Hardware latency monitor range(ns)
Range1:     1-448       Range2:   448-768       Range3:   768-1152      Range4:
1152-1536
Range5:  1536-2048      Range6:  2048-3072      Range7:  3072-5120      Range8:
5120-more

Port     monitor      event low    event high   drop-threshold
-------------------------------------------------------------------------------
eth-0-1  disable      disable      disable      disable
eth-0-2  disable      disable      disable      disable
eth-0-3  disable      disable      disable      disable
eth-0-4  disable      disable      disable      disable
eth-0-5  enable       768          3072         disable
eth-0-6  disable      disable      disable      disable
eth-0-7  disable      disable      disable      disable
eth-0-8  disable      disable      disable      disable
eth-0-9  enable       768          3072         disable
eth-0-10 disable      disable      disable      disable
eth-0-11 disable      disable      disable      disable
eth-0-12 disable      disable      disable      disable
eth-0-13 disable      disable      disable      disable
eth-0-14 disable      disable      disable      disable
eth-0-15 disable      disable      disable      disable
eth-0-16 disable      disable      disable      disable
eth-0-17 disable      disable      disable      disable
eth-0-18 disable      disable      disable      disable
eth-0-19 disable      disable      disable      disable
eth-0-20 disable      disable      disable      disable
```

## Related Commands

None

# 15.10.20 show hardware latency-monitor interface

## Command Purpose

Use this command to display the number of packets collected by latency monitor on a certain port. Use the clear form of the command to clear data on a port.

## Command Syntax

show hardware latency-monitor interface *IFPHYSICAL* ( | range <1-8> ) ( | <16-300000> )

clear hardware latency-monitor interface *IFPHYSICAL*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFPHYSICAL | Physical port number | Depending on the specific version model |
| <1-8> | Latency interval number | 1-8 |
| <16-300000> | The number of records displayed on the terminal | 16-300000 |

## Command Mode

Privileged EXEC

## Default

N/A

## Usage

N/A

## Examples

The following shows the top 20 statistics of eth-0-5 port in the delay range 6.:

```
Switch# show hardware latency-monitor interface eth-0-5 range 6 20
Brief CLI issued at: 09:52:57 UTC Fri Jan 28 2022
Format:  0-448 - the count of packets with latency between 0ns and 448ns
                            0      448      768     1152     1536     2048     3072
5120
                            -        -        -        -        -        -        -
-
Time                      448      768     1152     1536     2048     3072     5120
more
09:52:57.366657807         35     2447     4492     3633      994     1256     1207
581
09:52:57.356657807         41     2519     4743     3675     1016     1463     1001
180
09:52:57.346657807         55     2752     5017     3957      961     1213      637
51
09:52:57.336657807         43     2463     4629     3519      877     1266     1123
```

```
721
09:52:57.326657807        41     2464     4827     3900      959     1243      805
403
09:52:57.316657807        37     2681     4951     3767     1015     1187      750
256
09:52:57.306657807        49     2411     4614     3541      848     1254     1175
754
09:52:57.296657807        32     2581     4571     3635     1038     1475     1138
167
09:52:57.286657807        41     2666     5036     3875      885     1057      874
207
09:52:57.276657807        38     2506     4802     3792      976     1163     1105
260
09:52:57.266657807        44     2602     5010     3581      826      966     1142
472
09:52:57.256657807        49     2599     5079     3855      918     1012      837
293
09:52:57.246657807        45     2539     4829     3919      923     1176      881
330
09:52:57.236657807        46     2628     4902     3658      925     1170     1040
273
09:52:57.226657807        41     2730     4940     3684      821      985      940
501
09:52:57.216657807        50     2766     5094     4038      890      959      748
96
09:52:57.206657807        42     2588     4813     3816      885     1144     1051
307
09:52:57.196657807        41     2496     4920     3728      788     1258     1227
180
09:52:57.186657807        35     2640     4810     3946     1010     1305      833
66
09:52:57.176657807        45     2496     4782     3809      873     1103     1062
474
```

## Related Commands

hardware latency-monitor range

# 15.10.21 show hardware latency-monitor event interface

## Command Purpose

Use this command to display the delay events collected on a port. Use the clear form of the command to clear statistics on a port.

## Command Syntax

show hardware latency-monitor event interface *IFPHYSICAL*

clear hardware latency-monitor event interface *IFPHYSICAL*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFPHYSICAL | Physical port number | Depending on the specific version model |

## Command Mode

Privileged EXEC

## Default

N/A

## Usage

N/A

## Examples

The following shows the statistics of delayed events on port eth-0-5:

```
Switch# show hardware latency-monitor event interface eth-0-5
Brief CLI issued at: 10:06:13 UTC Fri Jan 28 2022
Flags              : S - Start record     E - End record
                Time  RangeId  Latency(ns)     Status      Source Port
-------------------------------------------------------------------------------
  10:06:13.098854000        7         3232          S          eth-0-3
  10:06:13.098849000        2          576          E          eth-0-3
  10:06:13.098845000        7         3360          S          eth-0-3
  10:06:13.098840000        2          576          E          eth-0-3
  10:06:13.098836000        7         3232          S          eth-0-3
  10:06:13.098832000        2          736          E          eth-0-1
  10:06:13.098827000        7         3072          S          eth-0-3
  10:06:13.098823000        2          672          E          eth-0-1
  10:06:13.098818000        7         3968          S          eth-0-3
  10:06:13.098814000        2          672          E          eth-0-3
  10:06:13.098810000        7         3488          S          eth-0-3
  10:06:13.098805000        2          704          E          eth-0-3
  10:06:13.098801000        7         3168          S          eth-0-3
  10:06:13.098797000        2          640          E          eth-0-3
```

## Related Commands

None

# 16 VPN Commands

## 16.1 VRF Commands

### 16.1.1 ip vrf

#### Command Purpose

To configure a VPN routing and forwarding (VRF) routing table, use the ip vrf command in global configuration mode. To remove a VRF routing table, use the no form of this command.

#### Command Syntax

ip vrf *VRF-NAME*

no ip vrf *VRF-NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VRF-NAME | VPN Routing/Forwarding instance name | Up to 31 characters |

#### Command Mode

Global Configuration

#### Default

None

#### Usage

None

## Examples

```
Switch# configure terminal
Switch(config)# ip vrf ComA
Switch(config-vrf)# route-target both 100:2
Switch(config-vrf)# route-target import 200:1
```

## Related Commands

ip vrf forwarding

# 16.1.2 show ip vrf

## Command Purpose

To show the set of defined VRFs and assocaited interfaces, use the show ip vrf command in Privileged EXEC mode.

## Command Syntax

show ip vrf ( bgp ( brief | detail ) | interfaces | ospf | rip | *VRF-NAME* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| bgp | Border Gateway Protocol (BGP) | - |
| brief | Brief VPN Routing/Forwarding instance information | - |
| detail | Detailed VPN Routing/Forwarding instance information | - |
| interfaces | Show VPN Routing/Forwarding interface information | - |
| ospf | Open Shortest Path First (OSPF) | - |
| rip | Routing Information Protocol (RIP) | - |
| VRF-NAME | VPN Routing/Forwarding instance name | Up to 31 characters |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

```
Switch# show ip vrf
```

## Related Commands

None

# 16.1.3 ip vrf forwarding

## Command Purpose

To associate a VPN routing and forwarding (VRF) instance with an Layer3 interface, use the ip vrf forwarding command in interface configuration mode. To disassociate a VRF, use the no form of this command.

## Command Syntax

ip vrf forwarding *VRF-NAME*

no ip vrf forwarding

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VRF-NAME | VPN Routing/Forwarding instance name | Up to 31 characters |

## Command Mode

Interface Configuration

## Default

None

## Usage

Executing this command on an interface removes the IP address on this interface, The IP address should be reconfigured.

## Examples

```
Switch# configure terminal
Switch(config)# ip vrf ComA
Switch(config-vrf)# exit
Switch(config)# interface eth-0-1
Switch(config-if)# no switchport
Switch(config-if)# ip vrf forwarding ComA
```

## Related Commands

ip vrf

ip route vrf

# 16.1.4 ip route vrf

## Command Purpose

To establish static routes for a VPN routing and forwarding (VRF) instance, use the ip route vrf command in global configuration mode. To remove static routes, use the no form of this command.

## Command Syntax

ip route vrf *VRF-NAME* ( *PREFIX MASK* | *PREFIX/PREFIX-LENGTH* ) ( *NH-ADDRESS* ( public | ) | vrf *VRF-NAME NH-ADDRESS* | *IFNAME* | *REMOTE-VTEP* ) ( *DISTANCE* | ) ( bind bfd *BFD-NAME* | track *NUMBER* | )

no ip route vrf *VRF-NAME* ( *PREFIX MASK* | *PREFIX/PREFIX-LENGTH* ) ( *NH-ADDRESS* ( public | ) | vrf *VRF-NAME NH-ADDRESS* | *IFNAME* | *REMOTE-VTEP* | ) ( bind bfd | track | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VRF-NAME | VPN Routing/Forwarding instance name | Up to 31 characters |
| PREFIX | IP route prefix for the destination | IPv4 address |

| | | |
|---|---|---|
| MASK | Prefix mask for the destination | Mask in IPv4 address format |
| PREFIX-LENGTH | Prefix length for the destination | 1-32 |
| NH-ADDRESS | IP address of the next hop that can be used to reach that network | IPv4 address |
| IFNAME | Interface name of the next hop that can be used to reach that network | Only support tunnel and null interface |
| REMOTE-VTEP | Overlay tunnel of the next hop that can be used to reach that network. | remote-vtep index |
| DISTANCE | (Optional) An administrative distance. The default administrative distance for a static route is 1 | 1-255 |
| BFD-NAME | Specify the name of bfd | A string up to 16 characters |
| NUMBER | Specify the ID of track object | 1-500 |

## Command Mode

Global Configuration

## Default

None

## Usage

None

## Examples

```
Switch# configure terminal
Switch(config)# ip route vrf VPN-NAME 2.2.2.0/24 1.1.1.2
```

## Related Commands

show ip route vrf

## 16.1.5 arp vrf

### Command Purpose

To add a permanent entry in the Address Resolution Protocol (ARP) cache for VRF, use the arp vrf command in global configuration mode. To remove an entry from VRF ARP cache, enter the no form of this command.

### Command Syntax

arp vrf *VRF_NAME IP_ADDR MAC*

no arp vrf *VRF_NAME IP_ADDR*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VRF-NAME | VPN Routing/Forwarding instance name | Up to 31 characters |
| IP_ADDR | IP address of the ARP entry | IPv4 Address |
| MAC | Hardware address of the ARP entry in HHHH.HHHH.HHHH format | MAC Address |

### Command Mode

Global Configuration

### Default

None

### Usage

None

### Examples

```
Switch# configure terminal
Switch(config)# arp vrf vpn3 1.1.1.1 0000.1111.2222
```

### Related Commands

show ip arp vrf VRF-NAME

clear ip arp vrf VRF-NAME A.B.C.D

## 16.1.6 show ip arp vrf

### Command Purpose

Use this command to show arp entry in VRF instance.

### Command Syntax

show ip arp vrf *VRF-NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VRF-NAME | VPN Routing/Forwarding instance name | Up to 31 characters |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to display all arp entry in the arp table of the VRF. :

```
Switch# show ip arp vrf ComA

 Protocol    Address          Age (min)  Hardware Addr   Interface
 Internet    1.1.1.1                 -   0000.1111.2222
```

## Related Commands

arp vrf

# 16.1.7 clear ip arp vrf

## Command Purpose

Use this command to refresh a specific dynamic ARP entry from ARP cache for the VRF.

## Command Syntax

clear ip arp vrf *VRF-NAME IP_ADDR*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VRF-NAME | VPN Routing/Forwarding instance name | Up to 31 characters |
| IP_ADDR | Dynamic learned ARP entry IP address | IPv4 Address |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example shows how to refresh a dynamic arp entry in VRF.:

```
Switch# clear ip arp vrf ComA 1.1.1.1
```

## Related Commands

arp vrf

# 16.1.8 ping vrf

## Command Purpose

Use this command to ping address in VRF.

## Command Syntax

ping vrf *VRF-NAME IPV4_HOST*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VRF-NAME | VPN Routing/Forwarding instance name | - |
| IPV4_HOST | Ping destination address or hostname | IPv4 Address or host name string |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

```
Switch# ping vrf vpn 1.1.1.1
PING 1.1.1.1 (1.1.1.1) 56(84) bytes of data.
64 bytes from 1.1.1.1: icmp_seq=0 ttl=64 time=0.114 ms
64 bytes from 1.1.1.1: icmp_seq=1 ttl=64 time=0.087 ms
64 bytes from 1.1.1.1: icmp_seq=2 ttl=64 time=0.087 ms
64 bytes from 1.1.1.1: icmp_seq=3 ttl=64 time=0.097 ms
64 bytes from 1.1.1.1: icmp_seq=4 ttl=64 time=0.133 ms
--- 1.1.1.1 ping statistics ---
```

```
5 packets transmitted, 5 received, 0% packet loss, time 4041ms
rtt min/avg/max/mdev = 0.087/0.103/0.133/0.020 ms, pipe 2
```

### Related Commands

None

## 16.1.9 traceroute vrf

### Command Purpose

Use this command to trace route in VRF.

### Command Syntax

traceroute vrf *VRF-NAME IPV4_HOST*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VRF-NAME | VPN Routing/Forwarding instance name | Up to 31 characters |
| WORD | Trace route destination address or hostname | IPv4 Address or host name string |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

```
Switch# traceroute vrf vpn 1.1.1.1
traceroute to 1.1.1.1 (1.1.1.1), 30 hops max, 38 byte packets
 1  1.1.1.1 (1.1.1.1)  0.222 ms  0.169 ms  0.169 ms
```

## Related Commands

None

# 16.1.10 telnet vrf

## Command Purpose

Use this command to telnet in VRF.

## Command Syntax

telnet vrf *VRF-NAME WORD*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VRF-NAME | VPN Routing/Forwarding instance name | Up to 31 characters |
| WORD | The destination address or hostname for telnet | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

```
Switch# telnet vrf vpn 9.9.9.2
Trying 9.9.9.2...
Connected to 9.9.9.2.
Escape character is '^]'.
Fedora Core release 4 (Stentz)
Kernel 2.6.32.23 on an i686
login: root
Password:
```

## Related Commands

None

# 16.1.11 rd

## Command Purpose

Use this command to set route distinguisher.

## Command Syntax

rd *RD-VALUE*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| RD-VALUE | Route distinguisher value. ASN:nn or IP-address:nn | The range of ASN is 1-4294967295 or in IPv4 format, The range of nn is 1-65535 |

## Command Mode

VRF Configuration

## Default

None

## Usage

None

## Examples

```
Switch# configure terminal
Switch(config)# ip vrf test
Switch(config-vrf)# rd 1.1.1.1:1
```

## Related Commands

None

## 16.1.12 route-target

### Command Purpose

Use this command to set route target.To unset route target, enter the no form of this command.

### Command Syntax

route-target ( both | export | import ) *RT-VALUE*

no route-target ( both | export | import ) ( *RT-VALUE* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| both | Import and export | - |
| export | Export | - |
| import | Import | - |
| RT-VALUE | Route-target value. ASN:nn or IP-address:nn | The range of ASN is 1-4294967295 or in IPv4 format, The range of nn is 1-65535 |

### Command Mode

VRF Configuration

### Default

None

### Usage

None

### Examples

```
Switch# configure terminal
Switch(config)# ip vrf test
Switch(config-vrf)# route-target import 100:1
```

## Related Commands

None

# 16.1.13 import map

## Command Purpose

Use this command to set import map.To unset import map, enter the no form of this command.

## Command Syntax

import map *WORD*

no import map

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| WORD | Pointer to route-map entries | Up to 20 characters |

## Command Mode

VRF Configuration

## Default

None

## Usage

None

## Examples

```
Switch# configure terminal
Switch(config)# ip vrf test
Switch(config-vrf)# import map 100
```

## Related Commands

export map

# 16.1.14 export map

## Command Purpose

Use this command to set export map.To unset export map, enter the no form of this command.

## Command Syntax

export map *WORD*

no export map

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| WORD | Pointer to route-map entries | Up to 20 characters |

## Command Mode

VRF Configuration

## Default

None

## Usage

None

## Examples

```
Switch# configure terminal
Switch(config)# ip vrf test
Switch(config-vrf)# export map 100
```

## Related Commands

import map

## 16.1.15 router-id

### Command Purpose

Use this command to set router-id.To unset router-id, enter the no form of this command.

### Command Syntax

router-id *IP_ADDR*

no router-id

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IP_ADDR | Router identifier in IP address format | IPv4 Address |

### Command Mode

VRF Configuration

### Default

None

### Usage

None

### Examples

```
Switch# configure terminal
Switch(config)# ip vrf test
Switch(config-vrf)# router-id 1.1.1.1
```

### Related Commands

show ip vrf

# 16.1.16 description

## Command Purpose

Use this command to specific VRF description.To remove VRF description, enter the no form of this command.

## Command Syntax

description *LINE*

no description

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| LINE | Characters describing this VRF | The name length should be no more than 40 and the first character must be a-z, A-Z or 0-9. |

## Command Mode

VRF Configuration

## Default

None

## Usage

None

## Examples

```
Switch# configure terminal
Switch(config)# ip vrf test
Switch(config-vrf)# description VrfName1
```

## Related Commands

show ip vrf

# 16.1.17 show resource vrf

## Command Purpose

Use this command to display the resources used by vrfs.

## Command Syntax

show resource vrf

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following is sample output from the show resource vrf command:

```
Switch# show resource vrf
VRF
Resource                          Used          Capability
================================================================
VRF number                         1               252
```

## Related Commands

None

# 16.2 GRE TUNNEL Commands

## 16.2.1 interface

### Command Purpose

Using this command to create a new tunnel interface. Use the no form of this command to destroy the tunnel interface.

### Command Syntax

interface tunnel *TUNNEL_ID*

no interface tunnel *TUNNEL_ID*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| TUNNEL_ID | tunnel id | 0-1023 |

### Command Mode

Global Configuration

### Default

None

### Usage

It just creates an interface structure, and then the tunnel interface can not be used before it is configured the mode.

### Examples

This example shows how to create a tunnel interface.:

```
Switch# configure terminal
Switch(config)# interface tunnel 1
```

### Related Commands

show interface tunnel

## 16.2.2 tunnel mode gre

### Command Purpose

This cammad is used for specifying the IPv4 transition tunnel protocol of gre, and the no form of this command can unset the tunnel protocol.

### Command Syntax

tunnel mode gre

no tunnel mode

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| gre | The gre tunnel is only supported in IPv4 network and encaped with IPv4 header. | - |

### Command Mode

Interface Configuration

### Default

None

### Usage

When configure the tunnel mode with gre, and then it is required configure tunnel source and tunnel destination manually.

### Examples

This example shows how to configure the tunnel with gre protocol:

```
Switch# configure terminal
Switch(config)# interface tunnel 1
Switch(config-if)# tunnel mode gre
```

### Related Commands

tunnel source

tunnel destination

## 16.2.3 tunnel source

### Command Purpose

This command is used to specify the tunnel source. Use the no form of this command to unset the tunnel source.

### Command Syntax

tunnel source ( *IP_ADDR* | *IFNAME* )

no tunnel source

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IP_ADDR | specify a tunnel source in the IPv4 address format | IPv4 Address |
| IFNAME | specify a tunnel source in the IFNAME format, the IFNAME should be layer3 interface, like routed port, vlan interface, loopback.. | Support physical/aggregation/loopback/vlan ports |

### Command Mode

Interface Configuration

### Default

None

### Usage

Every tunnel must have a tunnel source. If users specify the IFNAME format, system will choose the primary address as tunnel source

### Examples

This example shows how to set the tunnel source.:

```
Switch# configure terminal
Switch(config)# interface tunnel 1
Switch(config-if)# tunnel source 3.3.3.3
```

### Related Commands

tunnel mode gre

tunnel destination

## 16.2.4 tunnel destination

### Command Purpose

Use this command to specify a tunnel destination address in an IPv4 portion. Use the no parameter to un-specify the address.

### Command Syntax

tunnel destination *IP_ADDR*

no tunnel destination

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IP_ADDR | Specify the tunnel destination IPv4 address | IPv4 Address |

### Command Mode

Interface Configuration

### Default

None

### Usage

None

### Examples

this example shows how to set the tunnel destination.:

```
Switch# configure terminal
Switch(config)# interface tunnel 1
Switch(config-if)# tunnel destination 4.4.4.4
```

### Related Commands

tunnel source

tunnel mode gre

## 16.2.5 tunnel enable

### Command Purpose

Use this command to enable tunnel decapsulation for interfaces. Use the form of this command to restore the default configuration.

### Command Syntax

tunnel ( enable | disable )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| enable | | - |
| disable | | - |

### Command Mode

Interface Configuration

### Default

by default, tunnel decapsulation is disabled on all interfaces.

### Usage

None

### Examples

This example shows how to enable tunnel decapsulation on interface eth-0-1.:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# tunnel enable
```

### Related Commands

interface

## 16.2.6 tunnel gre key

### Command Purpose

Use this command to set the key of gre tunnel. Use the no form of this command to unset the key of gre tunnel.

### Command Syntax

tunnel gre key *KEY_VALUE*

no tunnel gre key

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| KEY_VALUE | gre key value | 1-4294967295 |

### Command Mode

Interface Configuration

### Default

None.

### Usage

Gre key is taken advantage of certification of packet and provides the security of gre tunnel. Gre key can support 32bits, but can not support to set 0.

## Examples

This example shows how to set gre key.:

```
Switch# configure terminal
Switch(config)# interface tunnel 1
Switch(config-if)# tunnel gre key 666
```

## Related Commands

tunnel source

# 16.2.7 tunnel dscp

## Command Purpose

Use this command to specify a value of Differentiated Services Code Point (DSCP) in the tunnel IPv4 encapsulation header. Use the no parameter to inheriting the underlying physical interface value by default.

## Command Syntax

tunnel dscp *DSCP*

no tunnel dscp

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DSCP | The outer IPv4 header DSCP value | 0-63 |

## Command Mode

Interface Configuration

## Default

By default, the DSCP value is inherited from original IPv6 packet.

## Usage

None.

## Examples

This example shows how to set the outer IPv4 header DSCP value as 40.:

```
Switch# configure terminal
Switch(config)# interface tunnel 1
Switch(config-if)# tunnel dscp 40
```

## Related Commands

show interface tunnel

interface

# 16.2.8 keepalive

## Command Purpose

Use this command to enable function of keepalive, it is used for checking whether gre tunnel peers is up or reachable.

## Command Syntax

keepalive *PERIOD_VALUE RETRY_VALUE*

no keepalive

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PERIOD_VALUE | Interval period | 1-32767 |
| RETRY_VALUE | timeout and retry | 1-255 |

## Command Mode

Interface Configuration

## Default

period_value: 10s

retry_value:3

### Usage

Only when the gre tunnel is in the state of up or keepalive down, then the keepalive packets can be sent out through the network port.

### Examples

This example shows how to enable the keepalive function with period value 10s and retry times 5:

```
Switch# configure terminal
Switch(config)# interface tunnel 1
Switch(config-if)# keepalive 10 5
```

### Related Commands

no keepalive

## 16.2.9 show interface tunnel

### Command Purpose

Use this command to display the tunnel information.

### Command Syntax

show interface tunnel *TUNNEL_ID*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| TUNNEL_ID | The tunnel ID | 0-1023 |

### Command Mode

Privileged EXEC

### Default

None.

## Usage

None

## Examples

This example displays the tunnel information.:

```
Switch# show interface tunnel 1
Interface tunnel1
  Interface current state: UP
  Hardware is Tunnel
  Index 8193 , Metric 1 , Encapsulation TUNNEL
  VRF binding: not bound
  Internet primary address:
    1.1.1.1/24 pointopoint 1.1.1.255
  Tunnel protocol/transport GRE/IP, Status Valid
  Tunnel source 192.192.168.1(eth-0-10), destination 10.10.10.10
  Tunnel DSCP inherit,  Tunnel TTL 255
  Tunnel transport MTU 1476 bytes
  Tunnel GRE key enable: 100
  Tunnel GRE keepalive enable, Send period: 5, Retry times: 3
  0 packets input, 0 bytes
  0 packets output, 0 bytes
```

## Related Commands

show resource tunnel

# 16.2.10 show resource tunnel

## Command Purpose

Use this command to display the tunnel peers resource information.

## Command Syntax

show resource tunnel

## Command Mode

Privileged EXEC

## Default

None.

## Usage

None

## Examples

This example displays the tunnel peers resource information.:

```
Switch# show tunnel resource
Tunnel
Resource                          Used          Capability
============================================================
Peers                             0             8
DUT1#
```

## Related Commands

None

# 16.2.11 show tunnel keepalive statistics

## Command Purpose

Use this command to display the statistics of gre tunnel keepalive.

## Command Syntax

show tunnel keepalive statistics ( | interface tunnel *TUNNEL_ID* )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| TUNNEL_ID | tunnel id | 0-1023 |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

This example displays the statistics of gre tunnel keepalive.:

```
Switch#  show tunnel keepalive statistics
Name         Status    Keepalive  Out_ka_pkt In_ka_pkt  TunnelUp TunnelDown
------------------------------------------------------------------------------
DUT1#
```

## Related Commands

clear tunnel keepalive statistics

# 16.2.12 clear tunnel keepalive statistics

## Command Purpose

Use this command to clear the statistics of gre tunnel keepalive.

## Command Syntax

clear tunnel keepalive statistics ( all | interface tunnel *TUNNEL_ID* )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| TUNNEL_ID | tunnel id | 0-1023 |

## Command Mode

Privileged EXEC

## Default

None

### Usage

None

### Examples

This example clears the statistics of gre tunnel keepalive.:

```
Switch# clear tunnel keepalive statistics all
```

### Related Commands

show tunnel keepalive statistics

## 16.2.13 clear tunnel statistics

### Command Purpose

Use this command to clear the statistics of tunnel include input and output.

### Command Syntax

clear tunnel statistics ( all | interface tunnel *TUNNEL_ID* )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| TUNNEL_ID | tunnel id | 0-1023 |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example clears the statistics of tunnel include input and output.:

```
Switch# clear tunnel statistics all
```

### Related Commands

show interface tunnel id

## 16.3 ERSPAN TUNNEL Commands

### 16.3.1 interface

### Command Purpose

Using this command to create a new tunnel interface. Use the no form of this command to destroy the tunnel interface.

### Command Syntax

interface tunnel *TUNNEL_ID*

no interface tunnel *TUNNEL_ID*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| TUNNEL_ID | tunnel id | 0-1023 |

### Command Mode

Global Configuration

### Default

None

### Usage

None

### Examples

```
Switch# configure terminal
Switch(config)# interface tunnel 1
```

### Related Commands

show interface tunnel

## 16.3.2 tunnel mode erspan

### Command Purpose

This cammad is used for specifying the IPv4 transition tunnel protocol of erspan, and the no form of this command can unset the tunnel protocol.

### Command Syntax

tunnel mode ( erspan ( ecmp-dst-gre | ) )

no tunnel mode

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| erspan | The tunnel mode is erspan, it has only one tunnel destination .Now, it supports IPv4 erspan tunnel, the playload packet should be IPv4 packet. | - |
| erspan ecmp-dst-gre | The tunnel mode is erspan, it has a certain of tunnel destinations,.Now, it supports IPv4 erspan tunnel, the playload packet should be IPv4 packet. | - |

### Command Mode

Interface Configuration

### Default

None

### Usage

When configure the tunnel mode with erspan, and then it is required configure tunnel source and tunnel destination manually.

### Examples

When configure the tunnel mode with erspan, and then it is required configure tunnel source and tunnel destination manually. :

```
Switch# configure terminal
Switch(config)# interface tunnel 1
Switch(config-if)# tunnel mode erspan
```

### Related Commands

tunnel source

tunnel destination

## 16.3.3 tunnel source

### Command Purpose

This command is used to specify the tunnel source. Use the no form of this command to unset the tunnel source.

### Command Syntax

tunnel source ( *IP_ADDR* | *IFNAME* )

no tunnel source

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IP_ADDR | specify a tunnel source in the IPv4 address format | IPv4 Address |
| IFNAME | specify a tunnel source in the IFNAME format, the IFNAME should be layer3 interface, like routed port, vlan interface, loopback.. | Support physical/aggregation/loopback/vlan ports |

### Command Mode

Interface Configuration

### Default

None

### Usage

None

### Examples

```
Switch# configure terminal
Switch(config)# interface tunnel 1
Switch(config-if)# tunnel source 3.3.3.3
```

### Related Commands

tunnel mode erspan

tunnel destination

## 16.3.4 tunnel destination

### Command Purpose

Use this command to specify a tunnel destination address in an IPv4 portion. Use the no parameter to un-specify the address.

### Command Syntax

tunnel destination *IP_ADDR*

no tunnel destination

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IP_ADDR | Specify the tunnel destination IPv4 address | IPv4 Address |

### Command Mode

Interface Configuration

### Default

None

### Usage

None

### Examples

```
Switch# configure terminal
Switch(config)# interface tunnel 1
Switch(config-if)# tunnel mode erspan
Switch(config-if)# tunnel destination 4.4.4.4
```

### Related Commands

tunnel source

tunnel mode erspan

## 16.3.5 tunnel ecmp-destination

### Command Purpose

Use this command to specify tunnel ecmp-destination address in an IPv4 portion. Use the no parameter to un-specify the address.

### Command Syntax

tunnel ecmp-destination *IP_ADDR*

no tunnel ecmp-destination *IP_ADDR*

no tunnel ecmp-destination all

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IP_ADDR | tunnel ecmp-destination address | - |

## Command Mode

Interface Configuration

## Default

None

## Usage

None

## Examples

This example shows how to set the tunnel ecmp-destination :

```
Switch# configure terminal
Switch(config)# interface tunnel 1
Switch(config)#tunnel mode erspan ecmp-dst-gre
Switch(config-if)# tunnel ecmp-destination 3.3.3.3
Switch(config-if)# tunnel ecmp-destination 4.4.4.4
```

## Related Commands

tunnel source

tunnel mode erspan ecmp-dst-gre

# 16.3.6 tunnel gre key

## Command Purpose

Use this command to set the key of erspan tunnel. Use the no form of this command to unset the key of erspan tunnel.

## Command Syntax

tunnel gre key *KEY_VALUE*

no tunnel gre key

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| KEY_VALUE | gre key value | 1-4294967295 |

### Command Mode

Interface Configuration

### Default

None

### Usage

None

### Examples

```
Switch# configure terminal
Switch(config-if)# tunnel gre key 666
```

### Related Commands

tunnel source

## 16.3.7 tunnel dscp

### Command Purpose

Use this command to specify a value of Differentiated Services Code Point (DSCP) in the tunnel IPv4 encapsulation header. Use the no parameter to inheriting the underlying physical interface value by default.

### Command Syntax

tunnel dscp *DSCP*

no tunnel dscp

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| DSCP | The outer IPv4 header DSCP value | 0-63 |

### Command Mode

Interface Configuration

## Default

None

## Usage

None

## Examples

```
Switch# configure terminal
Switch(config)# interface tunnel 1
Switch(config-if)# tunnel dscp 40
```

## Related Commands

interface

# 16.3.8 tunnel ttl

## Command Purpose

set this command to specify a value of time to live (ttl) in the tunnel IPv4 encapsulation header. Use the no parameter to inheriting the underlying physical interface value by default.

## Command Syntax

tunnel ttl *TTL*

no tunnel ttl

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| TTL | The outer IPv4 header ttl value | 1-254 |

## Command Mode

Interface Configuration

### Default

64

### Usage

None

### Examples

This example shows how to set the outer IPv4 header ttl value as 40.:

```
Switch# configure terminal
Switch(config)# interface tunnel 1
Switch(config-if)# tunnel ttl 40
```

### Related Commands

interface

## 16.3.9 tunnel extend-header

### Command Purpose

Use this command to set the extend-header information in erspan.

### Command Syntax

tunnel extend-header

no tunnel extend-header

### Command Mode

Interface Configuration

### Default

None.

## Usage

None.

## Examples

This example shows how to set extend-header in erspan mode:

```
Switch# configure terminal
Switch(config)# interface tunnel 1
Switch(config-if)# tunnel extend-header
```

## Related Commands

tunnel extend-header id

# 16.3.10 tunnel extend-header id

## Command Purpose

Use this command to set the extend-header id in erspan.Use the no form of this command can unset extend-header id in erspan

## Command Syntax

tunnel extend-header id *ID*

no tunnel extend-header id

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| ID | The extend-header id | 1-1023 |

## Command Mode

Interface Configuration

## Default

None.

### Usage

You must configure the tunnel extend-header before setting the extend-header id.

### Examples

This example shows how to set extend-header id in erspan mode:

```
Switch# configure terminal
Switch(config)# interface tunnel 1
Switch(config-if)# tunnel extend-header
Switch(config-if)# tunnel extend-header id 1
```

### Related Commands

tunnel extend-header

## 16.3.11 tunnel extend-header dst-load-balance

### Command Purpose

Use this command to set the extend-header dst-load-balance in erspan.Use the no form of this command can unset extend-header dst-load-balance in erspan

### Command Syntax

tunnel extend-header dst-load-balance

no tunnel extend-header dst-load-balance

### Command Mode

Interface Configuration

### Default

None.

### Usage

None

## Examples

This example shows how to set extend-header dst-load-balance in erspan mode:

```
Switch# configure terminal
Switch(config)# interface tunnel 1
Switch(config-if)# tunnel extend-header
Switch(config-if)# tunnel extend-header dst-load-balance
```

## Related Commands

tunnel extend-header

# 16.3.12 show resource tunnel

## Command Purpose

Use this command to show the resource usage of the tunnel.

## Command Syntax

show resource tunnel

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

```
Switch# show resource tunnel
Tunnel
Resource                        Used          Capability
============================================================
Peers                           3             8
```

## Related Commands

None

# 17 Network Virtualization Commands

## 17.1 Overlay Commands

### 17.1.1 vlan overlay enable

#### Command Purpose

Use this command to set vlan overlay enable/disable.

#### Command Syntax

vlan *VLAN_ID* overlay ( enable | disable )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan id | 2-4094 |
| enable | set the overlay feature of the VLAN to enable | - |
| disable | set the overlay feature of the VLAN to disable, and it is disabled by default | - |

#### Command Mode

VLAN Configuration

#### Default

Disable

#### Usage

Make Sure that overlay of vlan is enabled before configure overlay vlan and vni mapping.

### Examples

The following example shows how to set overlay of vlan 2 to enable:

```
Switch# configure terminal
Switch(config)# vlan database
Switch(config-vlan)# vlan 2
Switch(config-vlan)# vlan 2 overlay enable
```

### Related Commands

None

## 17.1.2 overlay

### Command Purpose

Use this command to enter overlay configure mode.

To return the configure mode, use the exit command.

### Command Syntax

overlay

### Command Mode

Global Configuration

### Default

None

### Usage

None

### Examples

The following example shows how to enter into overlay configure mode:

```
Switch# configure terminal
Switch(config)# overlay
Switch(config-overlay)#
```

### Related Commands

None

## 17.1.3 vlan vni

### Command Purpose

Use this command to mapping vlan id with overlay vni.

### Command Syntax

vlan *VLAN_ID* vni *VNI*

no vlan *VLAN_ID* vni

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan id | 2-4094 |
| VNI | vni id | 1-16777215 |

### Command Mode

OVERLAY Configuration

### Default

None

### Usage

The overlay mapping command is used to bind the vlan id with overlay vni. That means the vlan is now can work as one overlay bridge domain and all the port belong this vlan will also be in the overlay bridge domain.

### Examples

The following example set the overlay mapping:

```
Switch# configure terminal
Switch(config)# overlay
Switch(config-overlay)# vlan 20 vni 20000
```

The following example unset the overlay mapping:

```
Switch# configure terminal
Switch(config)# overlay
Switch(config-overlay)# no vlan 20 vni
```

### Related Commands

None

## 17.1.4 vni split-horizon-disable

### Command Purpose

Use this command to disable horizon split per vni. Use the no form of this command to enable horizon split per vni.

### Command Syntax

vni *VNI* split-horizon-disable

no vni *VNI* split-horizon-disable

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VNI | vni id | 1-16777215 |

### Command Mode

OVERLAY Configuration

### Default

Horizon split is enabled.

### Usage

None

## Examples

The following example shows how to disable horizon split per vni:

```
Switch# configure terminal
Switch(config)# overlay
Switch(config-overlay)# vni 20000 split-horizon-disable
```

The following example shows how to enable horizon split per vni:

```
Switch# configure terminal
Switch(config)# overlay
Switch(config-overlay)# no vni 20000 split-horizon-disable
```

## Related Commands

None

# 17.1.5 source

## Command Purpose

Use this command to set the overlay source vtep ip address.

To remove the source vtep ip address, use the no form of this command.

## Command Syntax

source ( *IP_ADDR* | *IPv6_ADDR* )

no ( ipv6 | ) source

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IP_ADDR | The overlay source vtep ip address, it should be a valid interface ip address. | IPv4 Address |
| IPv6_ADDR | The overlay source vtep ipv6 address, it should be a valid interface ipv6 address. | IPv6 Address |

## Command Mode

OVERLAY Configuration

## Default

None

## Usage

Overlay source vtep ip address is used to encap and decap overlay packets. It is recommended that the source vtep ip address is the same with some loopback interface address so that ip routing can be reachable.

## Examples

The following example sets the source vtep ip address of overlay:

```
Switch# configure terminal
Switch(config)# overlay
Switch(config-overlay)# source 1.1.1.1
Switch(config-overlay)# source 1111::1
```

The following example removes the source vtep ip address of overlay:

```
Switch# configure terminal
Switch(config)# overlay
Switch(config-overlay)# no source
Switch(config-overlay)# no ipv6 source
```

## Related Commands

None

# 17.1.6 remote-vtep

## Command Purpose

Use the overlay remote vtep command to specify the peer ip address and type of overlay entry. Use the no form of this command to remove the peer ip address and type of overlay entry.

## Command Syntax

remote-vtep *INDEX* ip-address *IP_ADDR_VTEP* type ( vxlan | nvgre | geneve ) ( { src-ip *IP_ADDR* | split-horizon-disable | keep-vlan-tag } | )

remote-vtep *INDEX* ipv6-address *IPv6_ADDR_VTEP* type ( vxlan | nvgre | geneve ) ( { src-ipv6 *IPv6_ADDR* | split-horizon-disable | keep-vlan-tag } | )

no remote-vtep index

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INDEX | Remote vtep index | 1-65535 |
| vxlan-peer | Remote vtep is vxlan vtep | - |
| nvgre-peer | Remote vtep is nvgre vtep | - |
| geneve-peer | Remote vtep is geneve vtep | - |
| IP_ADDR_VTEP | The overlay peer ip address, it should be a valid interface ip address. | IPv4 Address |
| IPv6_ADDR_VTEP | The overlay peer ipv6 address, it should be a valid interface ipv6 address. | IPv6 Address |
| IP_ADDR | Specify the overlay source ip address, it should be a valid interface ip address, it would use the global source ip address in default | IPv4 Address |
| IPv6_ADDR | Specify the overlay source ipv6 address, it should be a valid interface ipv6 address, it would use the global source ipv6 address in default | IPv6 Address |
| horizon-split-disable | Support to close horizon split of the tunnel with this vtep | - |
| keep-vlan-tag | means the vlan tags of original packet will not be stripped | - |

## Command Mode

OVERLAY Configuration

## Default

None

## Usage

This command is used to specify overlay vtep peer address and type on remote device, administrator must know all the peer addresses and types on the network and make sure that they can route between each other.

## Examples

The following example sets the overlay vxlan vtep peer address 2.2.2.2 and 2222::2 with source ip address 1.1.1.1 and 1111::1:

```
Switch# configure terminal
Switch(config)# overlay
Switch(config-overlay)# remote-vtep 20 ip-address 2.2.2.2 type vxlan src-ip 1.1.1.1
Switch(config-overlay)# remote-vtep 21 ipv6-address 2222::2 type vxlan src-ipv6
1111::1
```

The following example removes remote vtep:

```
Switch# configure terminal
Switch(config)# overlay
Switch(config-overlay)# no remote-vtep 20
```

## Related Commands

None

# 17.1.7 dscp-strategy

## Command Purpose

Use the overlay remote vtep command to configure the outer ip dscp gaining mode.

## Command Syntax

remote-vtep *INDEX* encapsulation-dscp-strategy ( dscp-copy | priority-map | custom-assign *VALUE* )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INDEX | Remote vtep index | 1-65535 |
| dscp-copy | Copy from inner ip dscp | - |
| priority-map | Map from priority of qos | - |
| custom-assign VALUE) | Assign dscp by users | 0-63 |

### Command Mode

OVERLAY Configuration

### Default

Dscp-copy

### Usage

When dscp-strategy is set priority-map, please configure QOS priority by MQC.

### Examples

The following example sets overlay dscp-strategy as custom-assign :

```
Switch# configure terminal
Switch(config)# overlay
Switch(config-overlay)# remote-vtep 20 dscp-strategy custom-assign 63
```

### Related Commands

None

## 17.1.8 Virtual-mac

### Command Purpose

Use the overlay virtual mac command to specify the virtual route mac address of remote vtep. Use the no form of this command to remove the virtual mac address of remote vtep.

### Command Syntax

remote-vtep *INDEX* virtual-mac *MAC*

no remote-vtep index virtual-mac

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INDEX | Remote vtep index | 1-65535 |
| MAC | The virtual mac address of remote vtep | MAC Address |

## Command Mode

OVERLAY Configuration

## Default

None

## Usage

The virtual mac address will be used as the inner mac address of DVR routes which don't specify the inner mac address.

## Examples

The following example sets the overlay remote vtep with the virtual mac a.a.a:

```
Switch# configure terminal
Switch(config)# overlay
Switch(config-overlay)# remote-vtep 20 virtual-mac a.a.a
```

The following example removes remote vtep virtual mac address:

```
Switch# configure terminal
Switch(config)# overlay
Switch(config-overlay)# no remote-vtep virtual-mac
```

## Related Commands

None

# 17.1.9 dot1q ethertype

## Command Purpose

Use the overlay dot1q ethertype command to specify the dot1q ethertype of remote vtep. Use the no form of this command to remove the dot1q ethertype.

## Command Syntax

remote-vtep *INDEX* dot1q ethertype *VALUE*

no remote-vtep *INDEX* dot1q ethertype

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INDEX | Remote vtep index | 1-65535 |
| VALUE | Ethertype value | The format is HEX |

## Command Mode

OVERLAY Configuration

## Default

None

## Usage

None

## Examples

The following example sets the overlay remote vtep with the ethertype 88a8

```
Switch# configure terminal
Switch(config)# overlay
Switch(config-overlay)# remote-vtep 20 dot1q ethertype 88a8
```

## Related Commands

None

# 17.1.10 vlan remote-vtep

## Command Purpose

Use the overlay peer command to specify the peer ip address and type of overlay vlan entry. Use the no form of this command to remove the peer ip address and type of overlay vlan entry.

## Command Syntax

vlan *VLAN_ID* remote-vtep *INDEX* ( tunnel-aware inner | )

no vlan *VLAN_ID* remote-vtep *INDEX*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan id | 2-4094 |
| INDEX | The overlay remote vtep index | 1-65535 |
| inner | If set, ACL/Flow tracing will use inner packet header information | - |

## Command Mode

OVERLAY Configuration

## Default

None

## Usage

Make sure the remote vtep is already created when setting vlan with remote vtep index.

## Examples

The following example sets the overlay vlan 20 with remote vtep 2 :

```
Switch# configure terminal
Switch(config)# overlay
Switch(config-overlay)# vlan 20 remote-vtep 2
```

The following example removes remote vtep 3 from vlan 20:

```
Switch# configure terminal
Switch(config)# overlay
Switch(config-overlay)# no vlan 20 remote-vtep 3
```

## Related Commands

None

# 17.1.11 vxlan uplink

## Command Purpose

Use the vxlan uplink command to enable or disable vxlan uplink port capability.

## Command Syntax

vxlan uplink ( enable | disable )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| enable | Make vxlan uplink port enable | - |
| disable | Make vxlan uplink port disable | - |

## Command Mode

Interface Configuration

## Default

Disable

## Usage

The command is allow setting on ether type port. This command is used to decapsulated the vxlan packet for l2 vni and l3 vni.

## Examples

This example shows how to enable vxlan uplink on interface:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# vxlan uplink enable
```

This example shows how to disable vxlan uplink on interface:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# vxlan uplink disable
```

## Related Commands

None

# 17.1.12 overlay uplink

## Command Purpose

Use the overlay uplink command to enable or disable overlay uplink port capability.

## Command Syntax

overlay uplink ( enable | disable )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| enable | Make overlay uplink port enable | - |
| disable | Make overlay uplink port disable | - |

## Command Mode

Interface Configuration

## Default

Disable

## Usage

The command is allow setting on ether type port. This command is used to decapsulated the overlay packet for l2 vni and l3 vni

## Examples

This example shows how to enable nvgre uplink on interface

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# overlay uplink enable
```

## Related Commands

None

# 17.1.13 mac-address-table forward remote-vtep

## Command Purpose

Use the overlay static fdb command to add or delete overlay static fdb.

## Command Syntax

mac-address-table *MAC_ADDR* forward remote-vtep *INDEX* vlan *VLAN_ID*

no mac-address-table mac-addr forward remote-vtep index vlan *VLAN_ID*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MAC_ADDR | Destination MAC addresses (unicast) to add to the address table. Packets with this destination address received in the specified VLAN are forwarded to the specified interface | MAC Address |
| INDEX | The index of remote vtep | 1-65535 |
| VLAN_ID | Specify the VLAN for which the packet with the specified MAC address is received. | 2-4094 |

## Command Mode

Global Configuration

## Default

None

## Usage

None

## Examples

This example shows how to add a static overlay fdb with remote-vtep 3 and vlan 2:

```
Switch# configure terminal
Switch(config)# mac-address-table 1.1.1 forward remote-vtep 3 vlan 2
```

This example shows how to delete a static overlay fdb with remote-vtep 3 and vlan 2:

```
Switch# configure terminal
Switch(config)# no mac-address-table 1.1.1 forward remote-vtep 3 vlan 2
```

### Related Commands

None

## 17.1.14 gateway-mac

### Command Purpose

Use the overlay gateway command to add or delete overlay gateway mac address.

### Command Syntax

vlan *VLAN_ID* gateway-mac mac-addr

no vlan *VLAN_ID* gateway-mac mac-addr

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan id | 2-4094 |
| mac-addr | Gateway MAC addresses (unicast) which VMs will use when they need to do routing. | - |

### Command Mode

OVERLAY Configuration

### Default

None

### Usage

The downlink port should be in trunk mode.

## Examples

This example shows how to add an overlay gateway with vlan 2:

```
Switch# configure terminal
Switch(config)# overlay
Switch(config-overlay)# vlan 2 gateway-mac 2.2.2
```

This example shows how to delete an static overlay fdb with nvgre vtep peer 2.2.2.2 and vlan 2:

```
Switch# configure terminal
Switch(config)# overlay
Switch(config-overlay)# no vlan 2 gateway-mac 2.2.2
```

## Related Commands

None

# 17.1.15 ip route remote-vtep

## Command Purpose

Use the overlay route command to add or delete overlay static routes.

## Command Syntax

ip route ( vrf *VRF_NAME* | ) ( *ADDRESS WILDCARD-MASK* | *ADDRESS/PREFIX-LENGTH* ) remote-vtep *INDEX* vni *VNI* ( | inner-macda mac-addr ) ( description *LINE* | )

no ip route ( vrf *VRF_NAME* | ) ( *ADDRESS WILDCARD-MASK* | *ADDRESS/PREFIX-LENGTH* ) remote-vtep *INDEX* vni *VNI* ( | inner-macda mac-addr ) ( description | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VRF_NAME | Vrf name | Up to 31 characters |
| ADDRESS | IPv4 address | IPv4 Address |
| WILDCARD-MASK | Mask for the associated IP subnet | IPv4 Address |
| PREFIX-LENGTH | Prefix length of the address | 1-32 |
| INDEX | The index of remote vtep | 1-65535 |
| VNI | vni id | 1-16777215 |

| | | |
|---|---|---|
| MAC_ADDR | Inner mac destination address | MAC Address |
| DESCRIPTION | The description for the route | should be no more than 80 characters, and the character can not include '?' |

## Command Mode

Global Configuration

## Default

None

## Usage

If the inner mac destination address is not specified, it will use the remote vtep's virtual mac address as the inner mac destination address.

## Examples

This example shows how to add an overlay route:

```
Switch# configure terminal
Switch(config)# ip route vrf tenant1 3.3.3.3/32 remote-vtep 3 vni 50000 inner-macda
a.a.a
Switch(config)# ip route vrf tenant1 4.4.4.4/32 remote-vtep 3 vni 50000
```

This example shows how to delete an an overlay route:

```
Switch# configure terminal
Switch(config)# no ip route vrf tenant1 3.3.3.3/32 nvgre-peer 5.5.5.5 vni 50000
inner-macda a.a.a
Switch(config)# no ip route vrf tenant1 4.4.4.4/32 nvgre-peer 5.5.5.5 vni 50000
```

## Related Commands

None

# 17.1.16 ipv6 route remote-vtep

## Command Purpose

Use the overlay IPv6 route command to add or delete overlay IPv6 static routes.

## Command Syntax

ipv6 route ( vrf *VRF_NAME* | ) *DEST_PREFIX* remote-vtep *INDEX* vni *VNI* ( | inner-macda *MAC* ) ( description *DESCRIPTION* | )

no ipv6 route ( vrf *VRF_NAME* | ) *DEST_PREFIX* remote-vtep *INDEX* vni *VNI* ( | inner-macda *MAC* ) ( description | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VRF_NAME | VRF instance name | Up to 31 characters |
| DEST_PREFIX | IPv6 route prefix (in format X:X::X:X/M) for the destination | IPv6 Address and mask length in X:X::X:X/M format |
| INDEX | The index of remote vtep | 1-65535 |
| VNI | vni id | 1-16777215 |
| MAC_ADDR | Inner mac destination address | MAC Address |
| DESCRIPTION | The description for the route | should be no more than 80 characters, and the character can not include '?' |

## Command Mode

Global Configuration

## Default

None

## Usage

If the inner mac destination address is not specified, it will use the remote vtep's virtual mac address as the inner mac destination address.

## Examples

This example shows how to add an overlay IPv6 route:

```
Switch# configure terminal
Switch(config)# ipv6 route 2000::/64 remote-vtep 3 vni 50000 inner-macda a.a.a
```

This example shows how to delete an an overlay IPv6 route:

```
Switch# configure terminal
Switch(config)# no ipv6 route 2000::/64 remote-vtep 3 vni 50000 inner-macda a.a.a
```

## Related Commands

None

# 17.1.17 overlay distributed-gateway

## Command Purpose

Use the command to enable or disable overlay distributed gateway.

## Command Syntax

overlay distributed-gateway ( enable | disable )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| enable | Enable overlay distributed gateway | - |
| disable | Disable overlay distributed gateway | - |

## Command Mode

Interface Configuration

## Default

None

## Usage

None

## Examples

This example shows how to enable overlay distributed gateway:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# overlay distributed-gateway enable
```

## Related Commands

None

# 17.1.18 selective qinq overlay mode

## Command Purpose

Use the command to configure the vlan edit mode of selective qinq port in overlay.

## Command Syntax

selective qinq overlay mode ( mapping | stripping )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| mapping | edit vlan tag with selective vlan mapping | - |
| stripping | strip svlan tag | - |

## Command Mode

Global Configuration

## Default

strip vlan

## Usage

None

## Examples

This example shows how to configure selective qinq vlan edit mode:

```
Switch# configure terminal
Switch(config)#selective qinq overlay mode mapping
```

### Related Commands

None

## 17.1.19 vxlan udp-dest-port

### Command Purpose

Use the command to config vxlan udp destport value.

### Command Syntax

vxlan udp-dest-port *PORT*

no vxlan udp-dest-port

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PORT | udp destport value | 1024-65535 |

### Command Mode

OVERLAY Configuration

### Default

4789

### Usage

When use this function, should make two switch config the same value

### Examples

This example shows how to config vxlan udp destport value:

```
Switch# configure terminal
Switch(config)# overlay
Switch(config-overlay)# vxlan udp-dest-port 8888
```

## Related Commands

None

# 17.1.20 qos tunnel-aware inner

## Command Purpose

Use inner packet information to process packet (eg ACL, Flow tracing processing). This command is used for overlay packets without tunnel decapsulation processing.

## Command Syntax

( no | ) qos tunnel-aware inner

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| no | Disable inner parse | - |

## Command Mode

Interface Configuration

## Default

Disable

## Usage

This command is used to force inner packet header process for overlay packets without tunnel decapsulation.

## Examples

This example shows how to enable force inner parse on interface:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)#  qos tunnel-aware inner
```

## Related Commands

None

# 17.1.21 qos tunnel-aware inner-outer-merge

## Command Purpose

Use inner and outer packet information to process packet (eg ACL, Flow tracing processing).

## Command Syntax

( no | ) inner-outer merge enable

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| no | Disable inner-outer merge mode | - |

## Command Mode

Interface Configuration

## Default

Disable

## Usage

This command is used to force inner and packet header information process for overlay packets.

## Examples

This example shows how to enable inner and outer parse on interface:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)#  qos tunnel-aware inner-outer-merge
```

### Related Commands

None

## 17.1.22 Show overlay

### Command Purpose

Use the show overlay command to show related overlay information.

### Command Syntax

show overlay ( vlan *VLAN_ID* )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan id | 2-4094 |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows all the overlay information:

```
Switch# show overlay


------------------------------------------------------------------------------
ECMP Mode         : Normal
Source VTEP       : 20.1.1.1

Vlan Vni        Type    Remote-vtep IP-Address       Src-Address       Split-Horizon
------------------------------------------------------------------------------
10   10000      VxLAN   1           2.2.2.2          1.1.1.1           Enable
```

This example shows the overlay information of vlan 2:

```
Switch# show overlay vlan 2
------------------------------------------------------------
ECMP Mode        : Normal
Source VTEP      : 1.1.1.1
Remote VTEP Index: 1, Ip address: 2.2.2.2, Type: VxLAN
Remote VTEP Index: 2, Ip address: 3.3.3.3, Type: VxLAN
------------------------------------------------------------
VLAN ID        : 2
VNI            : 20000
Remote VTEP NUM: 2
          Index: 1, Ip address: 2.2.2.2,  Type: VxLAN
          Index: 2, Ip address: 3.3.3.3,  Type: VxLAN
DVR Gateway NUM: 0
------------------------------------------------------------
```

### Related Commands

None

## 17.2 EVPN Commands

### 17.2.1 address-family l2vpn evpn

#### Command Purpose

Use this command to enter EVPN address family configure mode.

Use the no parameter of this command to cancel EVPN configuration in BGP.

#### Command Syntax

address-family l2vpn evpn

no address-family l2vpn evpn

#### Command Mode

Router Configuration

#### Default

None

### Usage

Use the address family command to enter the address family mode allowing configuration of address-family specific parameters. To leave the address family mode and return to the Configure mode use the exit-address-family command.

EVPN feature should be enabled before enter this address family configure mode.

### Examples

The following example shows how to EVPN address family configure mode:

```
Switch# configure terminal
Switch(config)# router bgp 1
Switch(config-router)# address-family l2vpn evpn
Switch(config-router-af)#
```

### Related Commands

exit-address-family

## 17.2.2 debug overlay evpn

### Command Purpose

Use this command to enable all EVPN troubleshooting functions on Overlay.

Use no format of this command to disable this configuration.

### Command Syntax

debug overlay evpn

no debug overlay evpn

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following example shows how to debug EVPN on overlay:

```
Switch# debug overlay evpn
```

### Related Commands

overlay host-collect

## 17.2.3 evpn

### Command Purpose

Use this command to enable EVPN function and enter EVPN configure mode.

Use no format of this command to disable EVPN function.

### Command Syntax

evpn

no evpn

### Command Mode

Global Configuration

### Default

Disable

### Usage

This command can enable EVPN function. And after entering EVPN configure mode, EVPN instance can be created. When the function had been disabled, all EVPN instances will be deleted.

### Examples

The following example shows how to enable EVPN function:

```
Switch# configure terminal
Switch(config)#evpn
Switch(config-evpn)#
```

### Related Commands

address-family l2vpn evpn

## 17.2.4 overlay host-collect

### Command Purpose

Use this command to enable host information collection.

Use no format of the command to disable this configuration.

### Command Syntax

overlay host-collect ( enable | disable )

### Command Mode

Interface Configuration

### Default

Disable

### Usage

After host collection was enabled and both RD and route-target of EVPN instance was configured, host information from dynamic arp will be sent to BGP module to format and advertise EVPN type 2 route.

## Examples

The following example shows how to enable host information collection on interface:

```
Switch# configure terminal
Switch(config)#interface vlan 100
Switch(config-if)# overlay host-collect enable
```

## Related Commands

evpn

# 17.2.5 rd

## Command Purpose

Use this command to set route distinguisher.for EVPN instance.

## Command Syntax

rd ( auto | *RD-VALUE* )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| auto | Automatically generates an RD in the N:VXLAN ID format | - |
| RD-VALUE | Route distinguisher value. ASN:nn or IP:nn | ASN range is 1-4294967295 nn range is 1-65535 |

## Command Mode

EVI Configuration

## Default

None

## Usage

None

## Examples

The following example shows how to set rd:

```
Switch# configure terminal
Switch(config)#evpn
Switch(config-evpn)#vni 100
Switch(config-evi)# rd auto
```

## Related Commands

vni

# 17.2.6 route-target

## Command Purpose

Use this command to set route target for EVPN instance.

Use no format of the command to cancel the configuration.

## Command Syntax

route-target ( import | export | both ) ( auto | *RT-VALUE* )

no route-target ( import | export | both ) ( auto | *RT-VALUE* )

no route-target ( import | export | both | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| import | Import direction | - |
| export | Export direction | - |
| both | Import and export direction | - |
| auto | Automatically generates an route target | - |
| RT-VALUE | Route target value. ASN:nn or IP:nn | ASN range is 1-4294967295 nn range is 1-65535 |

## Command Mode

EVI Configuration

## Default

None

## Usage

None

## Examples

The following example shows how to set route target:

```
Switch# configure terminal
Switch(config)#evpn
Switch(config-evpn)#vni 100
Switch(config-evi)# route-target both auto
```

## Related Commands

vni

# 17.2.7 route-target evpn

## Command Purpose

Use this command to set route target for EVPN instance in vrf mode.

Use no format of the command to cancel the configuration.

## Command Syntax

route-target ( import | export | both ) ( *RT-VALUE* ) evpn

no route-target ( import | export | both ) ( auto | *RT-VALUE* )

no route-target ( import | export | both | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| import | Import direction | - |
| export | Export direction | - |
| both | Import and export direction | - |

| | | |
|---|---|---|
| RT-VALUE | Route target value.<br>ASN:nn or IP:nn | ASN range is 1-4294967295<br>nn range is 1-65535 |

### Command Mode

VRF Configuration

### Default

None

### Usage

None

### Examples

The following example shows how to set route target:

```
Switch# configure terminal
Switch(config)#ip vrf a
Switch(config-vrf)# route-target both 1:1 evpn
```

### Related Commands

vxlan vni

## 17.2.8 neighbor attribute-unchanged

### Command Purpose

Use this command to advertise unchanged BGP attributes to the specified neighbor.

Use no format with this command to disable this function.

### Command Syntax

neighbor ( *IP_ADDR* | *WORD* ) attribute-unchanged next-hop

no neighbor ( *IP_ADDR* | *WORD* ) attribute-unchanged next-hop

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IP_ADDR | Specifies the address of the BGP neighbor in IPv4 format | IPv4 Address |
| WORD | Name of an existing peer-group | Up to 20 characters |

## Command Mode

Address Family Configuration

## Default

None

## Usage

None

## Examples

The following example shows how to set nexthop unchanged attribute:

```
Switch# configure terminal
Switch(config)#router bgp 100
Switch(config-router)#address-family l2vpn evpn
Switch(config-router-af)# neighbor 1.1.1.1 attribute-unchanged next-hop
```

## Related Commands

address-family l2vpn evpn

# 17.2.9 neighbor send-community

## Command Purpose

Use this command to specify that a community attribute should be sent to a BGP neighbor.

Use no format with this command to remove the entry.

## Command Syntax

neighbor ( *IP_ADDR* | *WORD* ) ( both | extended | standard )

no neighbor ( *IP_ADDR* | *WORD* ) ( both | extended | standard )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IP_ADDR | Specifies the address of the BGP neighbor in IPv4 format | IPv4 Address |
| WORD | Name of an existing peer-group | Up to 20 characters |
| both | Sends Standard and Extended Community attributes | - |
| extended | Sends Extended Community attributes | - |
| standard | Sends Standard Community attributes | - |

## Command Mode

Address Family Configuration

## Default

None

## Usage

None

## Examples

The following example shows how to set send-community attribute:

```
Switch# configure terminal
Switch(config)#router bgp 100
Switch(config-router)#address-family l2vpn evpn
Switch(config-router-af)# neighbor 1.1.1.1 send-community extended
```

## Related Commands

address-family l2vpn evpn

# 17.2.10 neighbor route-reflector-client

## Command Purpose

Use this command to configure the router as a BGP route reflector and configure the specified neighbor as its client.

Use the no parameter with this command to indicate that the neighbor is not a client.

## Command Syntax

neighbor *NEIGHBORID* route-reflector-client

no neighbor *NEIGHBORID* route-reflector-clien

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| NEIGHBORID | (A.B.C.D\|TAG) | - |
| IP_ADDR | Specifies the address of the BGP neighbor in IPv4 format. | IPv4 Address |
| TAG | Name of an existing peer-group. For information on how to create peer groups, refer to the neighbor peer-group and neighbor remote-as commands. When this parameter is used with a command, the command applies on all peers in the specified group. | - |

## Command Mode

Address Family Configuration

## Default

N/A

### Usage

Route reflectors are a solution for the explosion of iBGP peering within an autonomous system. By route reflection the number of iBGP peers within an AS is reduced. Use the neighbor route-reflector-client command to configure the local router as the route reflector and specify neighbors as its client.

An AS can have more than one route reflector. One route reflector treats the other route reflector as another iBGP speaker.

### Examples

```
Switch# configure terminal
Switch(config)#router bgp 100
Switch(config-router)#address-family l2vpn evpn
Switch(config-router-af)# neighbor 10.10.0.72 route-reflector-client
```

### Related Commands

N/A

## 17.2.11 retain route-target all

### Command Purpose

Use this command to configure the bgp route would not delete when they are not duplicated into evpn instance.

Use no format of this command to cancel the configuration.

### Command Syntax

retain route-target all

### Command Mode

Address Family Configuration

### Default

None

### Usage

when the bgp would be used for transmitting the bgp route as the underlay network, it should set this configuration.

### Examples

The following example shows how to set this configuraion:

```
Switch# configure terminal
Switch(config)#router bgp 100
Switch(config-router)#address-family l2vpn evpn
Switch(config-router-af)#retain route-target all
```

### Related Commands

evpn

## 17.2.12 advertise l2vpn evpn

### Command Purpose

Use this command to configure the bgp vrf instance route could be advertised into the evpn instance.

Use no format of this command to cancel the configuration.

### Command Syntax

advertise l2vpn evpn

### Command Mode

Address Family Configuration

### Default

None

## Usage

When it is needed to advertise the route of vrf instance to the evpn instance as type5 route, it should set this configuration.

## Examples

The following example shows how to set this configuraion:

```
Switch# configure terminal
Switch(config)#router bgp 100
Switch(config-router)#address-family ipv4 vrf a
Switch(config-router-af)#advertise l2vpn evpn
```

## Related Commands

evpn

# 17.2.13 vni

## Command Purpose

Use this command to create EVPN instance.

Use no format of this command to cancel the configuration.

## Command Syntax

vni *VAL*

no vni *VAL*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VAL | The ID of vni | 1-16777215 |

## Command Mode

EVPN Configuration

## Default

None

## Usage

The EVPN instance will be ready until both RD and route-target is set.

## Examples

The following example shows how to create an EVPN instance:

```
Switch# configure terminal

Switch(config)#evpn
Switch(config-evpn)# vni 2001
Switch(config-evi)#
```

## Related Commands

evpn

# 17.2.14 vxlan vni

## Command Purpose

Use this command to create EVPN instance of vrf.

Use no format of this command to cancel the configuration.

## Command Syntax

vxlan vni *VAL*

no vxlan vni *VAL*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VAL | The ID of vni | 1-16777215 |

## Command Mode

EVPN Configuration

## Default

None

## Usage

The EVPN instance will be ready until both RD and route-target is set.

## Examples

The following example shows how to create an EVPN instance:

```
Switch# configure terminal
Switch(config)#ip vrf a
Switch(config-vrf)# vxlan vni 1000
```

## Related Commands

evpn

# 17.2.15 vxlan uplink

## Command Purpose

Use the vxlan uplink command to enable or disable vxlan uplink port capability.

## Command Syntax

vxlan uplink ( enable | disable )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| enable | Make vxlan uplink port enable | - |
| disable | Make vxlan uplink port disable | - |

## Command Mode

Interface Configuration

## Default

Disable

## Usage

The command is allow setting on ether type port. This command is used to decapsulated the vxlan packet for l2 vni and l3 vni

## Examples

This example shows how to enable vxlan uplink on interface:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# vxlan uplink enable
```

## Related Commands

None

# 17.2.16 interface nve

## Command Purpose

Use this command to create an iterface nve.

Use no format of this command to cancel the configuration.

## Command Syntax

interface nve *IFNVE*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNVE | The index of nve if | 0-3 |

## Command Mode

Global Configuration

## Default

None

## Usage

There are four nves configured because of four source ip address of overlay

## Examples

The following example shows how to create an interface nve:

```
Switch# configure terminal
Switch(config)#interface nve 1
```

## Related Commands

show interface nve

# 17.2.17 source

## Command Purpose

Use this command to set the overlay source vtep ip address of nve.

To remove the source vtep ip address of nve, use the no form of this command.

## Command Syntax

source ( *IP_ADDR* | *IFNAME* )

no source

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IP_ADDR | The overlay source vtep ip address of nve, it should be a valid interface ip address. | IPv4 Address |
| IFNAME | The overlay source interface of nve must have primary ip address | Aggregation, physical , vlan and loopback interface |

## Command Mode

Interface Configuration

## Default

None

## Usage

Overlay source vtep ip address is used to encap and decap overlay packets. It is recommended that the source vtep ip address is the same with some loopback interface address so that ip routing can be reachable.

## Examples

The following example sets the source vtep ip address of nve:

```
Switch# configure terminal
Switch(config)#interface nve 1
Switch(config-if)# source 1.1.1.1
switch# show interface nve 1
Interface nve1
  Interface current state: UP
  Index 540673 , Metric 0 , Encapsulation VXLAN
  VRF binding: not bound
  Tunnel protocol/transport Vxlan, Status Valid
  Source 1.2.3.4 (loopback1)
  tunnel keep-vlan-tag disable
  tunnel split-horizon enable
  tunnel encapsulation-dscp-strategy dscp-copy
  Vni 10000, protocol type bgp, Inclusive-multi(local) active
  Vni 20000, protocol type bgp (associate-vrf), Inclusive-multi(local) inactive
```

## Related Commands

None

# 17.2.18 member vni

## Command Purpose

Use this command to bind the vni with the nve.

To unbind the vni from the nve, use the no form of this command.

## Command Syntax

member vni ( *VAL* ) ( associate-vrf | )

no member vni ( *VAL* ) ( associate-vrf | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VAL | The vni of value | 1-16777215 |
| associate-vrf | The L3 vni of vrf | - |

## Command Mode

Interface Configuration

## Default

None

## Usage

The vni without associate-vrf is L2 vni and other is L3 vni

## Examples

The following example configure the L2 vni for nve if:

```
Switch# configure terminal
Switch(config)#interface nve 1
Switch(config-if)# member vni 10000
switch#  show interface nve 1
Interface nve1
  Interface current state: UP
  Index 540673 , Metric 0 , Encapsulation VXLAN
  VRF binding: not bound
  Tunnel protocol/transport Vxlan, Status Valid
  Source 1.2.3.4 (loopback1)
  tunnel keep-vlan-tag disable
  tunnel split-horizon enable
  tunnel encapsulation-dscp-strategy dscp-copy
  Vni 10000, protocol type bgp, Inclusive-multi(local) active
```

## Related Commands

None

# 17.2.19 dscp-strategy

## Command Purpose

Use the command to configure the outer ip dscp gaining mode.

## Command Syntax

encapsulation-dscp-strategy ( dscp-copy | priority-map | custom-assign *VALUE* )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| dscp-copy | Copy from inner ip dscp | - |
| priority-map | Map from priority of qos | - |
| VALUE | Assign dscp by users | 0-63 |

## Command Mode

Interface Configuration

## Default

Dscp-copy

## Usage

When dscp-strategy is set priority-map, please configure QOS priority by MQC.

## Examples

The following example sets overlay dscp-strategy as custom-assign :

```
Switch# configure terminal
Switch(config)#interface nve 1
Switch(config- if)#encapsulation-dscp-strategy custom-assign 63
```

## Related Commands

None

# 17.2.20 virtual-mac

## Command Purpose

Use the virtual mac command to specify the virtual route mac address of nve vtep.

Use the no form of this command to remove the virtual mac address of nve vtep.

## Command Syntax

virtual-mac *MAC*

no virtual-mac

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| MAC | The virtual mac address of remote vtep of nve | HHHH.HHHH.HHHH |

## Command Mode

Interface Configuration

## Default

None

## Usage

The virtual mac address will be used as the inner mac address of routes for evpn firstly.

## Examples

The following example sets the nve remote vtep with the virtual mac a.a.a:

```
Switch# configure terminal
Switch(config)#interface nve 1
Switch(config- if)#virtual-mac a.a.a
```

## Related Commands

None

# 17.2.21 keep-vlan-tag

## Command Purpose

Use the commad to configure the nve remote vtep for keep the inner vlan tag。

## Command Syntax

keep-vlan-tag ( enable | disable )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| enable | enable keep vlan tag | - |
| disable | diable keep vlan tag | - |

## Command Mode

Interface Configuration

## Default

diable

## Usage

None

## Examples

The following example enables the remote vtep keep vlan tag of nve:

```
Switch# configure terminal
Switch(config)#interface nve 1
Switch(config-if)#keep-vlan-tag enable
```

## Related Commands

None

# 17.2.22 split-horizon

## Command Purpose

Use the commad to configure the nve remote vtep for split-horizon。

## Command Syntax

split-horizon ( enable | disable )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| enable | enable split-horizon | - |
| disable | disable split-horizon | - |

## Command Mode

Interface Configuration

## Default

enable

## Usage

None

## Examples

The following example disables the split-horizon of overlay tunnel.:

```
Switch# configure terminal
Switch(config)#interface nve 1
Switch(config- if)#split-horizon disable
```

## Related Commands

None

# 17.2.23 evpn inclusive-multicast

## Command Purpose

Use the commad to configure the evpn inclusive multiple route whether it can be sent。

## Command Syntax

evpn inclusive-multicast ( enable | disable )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| enable | enable sending inclusive-multicast route | - |
| disable | disable sending inclusive multicast route | - |

## Command Mode

Interface Configuration

## Default

enable

## Usage

None

## Examples

The following example disables the sending inclusive- multicast route by nve.:

```
Switch# configure terminal
Switch(config)#interface nve 1
Switch(config- if)#evpn inclusive-multicast disable
```

## Related Commands

None

## 17.2.24 vlan arp-broadcast-suppress

### Command Purpose

Use the command to enable the arp broadcast suppress of vlan. Use the no form of this command to remove the configuration.

### Command Syntax

vlan *VLAN_ID* arp-broadcast-suppress ( enable | disable )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan id | 2-4094 |
| enable | enable arp broadcast suppress | - |
| disable | disable arp broadcast suppress | - |

### Command Mode

VLAN Configuration

### Default

disable

### Usage

None

### Examples

The following example enables arp broadcast suppress of vla 10.:

```
Switch# configure terminal
Switch(config)#vlan database
Switch(config- vlan)#vlan 10 arp-broadcast-suppress enable
```

### Related Commands

None

## 17.2.25 evpn mode

### Command Purpose

Use the command to configure the evpn mode as asymmetry. Use the no form of this command to remove the configuration.

### Command Syntax

evpn mode asymmetry

### Command Mode

Global Configuration

### Default

symmetry

### Usage

None

### Examples

The following example configures the evpn mode as asymmetry.:

```
Switch# configure terminal
Switch(config)#evpn mode asymmetry
```

### Related Commands

None

## 17.2.26 vlan mac-address-tunnel learning-disable

### Command Purpose

Use the command to diable the inner fdb learning of evpn tunnel. Use the no form of this command to remove the configuration.

## Command Syntax

vlan *VLAN_ID* mac-address-tunnel learning-disable

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| VLAN_ID | Vlan id | 2-4094 |

## Command Mode

OVERLAY Configuration

## Default

None

## Usage

None

## Examples

The following example configures the tunnel fdb learning disable for vlan 10.:

```
Switch# configure terminal
Switch(config)#overlay
Switch(config-overlay)#vlan 10 mac-address-tunnel learning-disable
```

## Related Commands

None

# 17.2.27 show bgp evpn

## Command Purpose

Use this command to display the route information of EVPN.

## Command Syntax

show bgp evpn ( all | rd *VAL* | vni *VAL* ) ( route-type ( mac-ip | inclusive-multi | ip-prefix | ) | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| all | Display all EVPN route | - |
| rd VAL | Secify the rd to display EVPN route | Route distinguisher value. ASN:nn or IP:nn<br>ASN range is 1-4294967295<br>nn range is 1-65535 |
| vni VAL | Secify the vni to display EVPN route | 1-16777215 |
| route-type | Specify the type of EVPN route | - |
| mac-ip | MAC/IP Advertisement Route | - |
| inclusive-multi | Inclusive-Multiple Advertisement Route | - |
| ip-prefix | ip-prefix Advertisement Route | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following example shows how to display the route information of EVPN:

```
Switch# show bgp evpn all
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
              S Stale
Origin codes: i - IGP, e - EGP, ? - incomplete
   Network          Next Hop            Metric LocPrf Weight Path
Route Distinguisher: 1:2001 (VNI 2001)
*> [2]:[0]:[48]:[8264.c465.9400]:[32]:[12.12.12.2]/136
                    1.1.1.1                                32768 i
*> [2]:[0]:[48]:[8264.c465.9400]:[32]:[12.12.12.3]/136
                    1.1.1.1                                32768 i
```

## Related Commands

evpn

# 17.2.28 show bgp evpn instance

## Command Purpose

Use this command to display the instance information of EVPN.

## Command Syntax

show bgp evpn instance ( all | vni *VAL* )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| all | all evpn intance | - |
| vni VAL | Secify the vni to display EVPN instance | 1-16777215 |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following example shows how to display the information of EVPN instance:

```
Switch# show bgp evpn instance vni 10000
Swicth# show bgp evpn instance vni 10000
EVPN instance vni   : 10000
 Address family     : evpn
 Route Distinguisher: 1:10000(auto)
 Route Target Export: assigned
                    : 1:10000
 Route Target Import: assigned
```

```
                    : 1:10000
 Route Map Export   : -
 Route Map Import   : -
DUT2#
```

### Related Commands

None

## 17.2.29 show bgp evpn neighbors

### Command Purpose

Use this command to display the neighbor information of EVPN.

### Command Syntax

show bgp evpn ( neighbors *IP_ADDR* | summary | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IP_ADDR | Secify the IP address of neighbor | IPv4 Address |
| summary | Display the summary information of EVPN neighbors | - |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following example shows how to display the summary information of EVPN neighbors:

```
Switch# show bgp evpn summary
BGP router identifier 12.12.12.1, local AS number 1
BGP table version is 10
1 BGP AS-PATH entries
0 BGP community entries
Neighbor        V         AS MsgRcvd MsgSent   TblVer  InQ OutQ Up/Down
State/PfxRcd
1.1.1.2         4          1     946     954       10    0    0 13:35:36        0
Total number of neighbors 1
```

### Related Commands

evpn

## 17.2.30 show overlay host-information

### Command Purpose

Use this command to display the host information.

### Command Syntax

show overlay host-information ( vni *VAL* | summary )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| vni VAL | Secify the vni to display host information, range in [1,16777215] | 1-16777215 |
| summary | Specify the summary of host information | - |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

## Examples

The following example shows how to display the route information of EVPN:

```
Switch# show overlay host-information vni 2001
Mac            IP address      VTEP address    Tunnel Route
------------------------------------------------------------
8264.c465.9400 12.12.12.3      1.1.1.1           N      N
```

## Related Commands

evpn

# 17.2.31 show interface nve

## Command Purpose

Use this command to display the interface nve information.

## Command Syntax

show interface nve *INDEX*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INDEX | The index of nve if | 0-3 |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following example shows how to display the nve if information:

```
Switch# show interface nve 1
Switch# show interface nve 1
Interface nve1
  Interface current state: UP
  Index 540673 , Metric 0 , Encapsulation VXLAN
  VRF binding: not bound
  Tunnel protocol/transport Vxlan, Status Valid
  Source 1.2.3.4 (loopback1)
  tunnel keep-vlan-tag disable
  tunnel split-horizon enable
  tunnel encapsulation-dscp-strategy dscp-copy
  Vni 10000, protocol type bgp, Inclusive-multi(local) active
  Vni 20000, protocol type bgp (associate-vrf), Inclusive-multi(local) inactive
```

### Related Commands

None

## 17.2.32 show overlay tunnel

### Command Purpose

Use this command to display the overlay tunnel info.

### Command Syntax

show overlay tunnel ( static | evpn | interface nve *IFNVE* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| static | tunnel of static | - |
| evpn | tunnel of evpn | - |
| IFNVE | The index of nve if | 0-3 |

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

## Examples

The following example shows how to display the overlay tunnel information:

```
Switch# show overlay tunnel evpn
switch# show overlay tunnel evpn
------------------------------------------------------------------------------
Vlan Vni       Type   Remote-vtep IP-Address       Src-Address      Head-end-
flooding Protocol
10   10000     VxLAN  0           10.20.30.40      1.2.3.4          Enable
Evpn
DUT2#
```

## Related Commands

None

# 17.2.33 show overlay evpn remote-vtep

## Command Purpose

Use this command to display the overlay evpn vtep info.

## Command Syntax

show overlay evpn remote-vtep ( interface nve *IFNVE* )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNVE | The index of nve if | 0-3 |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following example shows how to display the overlay tunnel information:

```
Switch# show overlay evpn remote-vtep interface nve 1
switch# show overlay evpn remote-vtep interface nve 1
------------------------------------------------------------------------------------
-----------------
Nve         Vni         Src-ip            Dst-ip            Keep-vlan   Split-horizon
Dscp-strategy
nve1        10000       1.2.3.4           10.20.30.40       Disable     Enable
Dscp-copy
```

## Related Commands

None

# 17.2.34 show overlay mac-forwarding-information

## Command Purpose

Use this command to display the remote fdb information.

## Command Syntax

show overlay mac-forwarding-information ( vni *VAL* | summary )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| vni VAL | Secify the vni to display host information, range in [1,16777215] | 1-16777215 |
| summary | Specify the summary of host information | - |

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

## Examples

The following example shows how to display the mac forward information of EVPN:

```
Switch# show overlay mac-forwarding-information vni 10000
switch# show overlay mac-forwarding-information vni 10000
Vlan  Mac            IP address      Tunnel
-------------------------------------------------------
10    6ae7.f8cb.7700 10.20.30.40       Y
```

## Related Commands

evpn

# 18 Intelligent Lossless Network Commands

## 18.1 PFC Commands

### 18.1.1 priority-flow-control mode

#### Command Purpose

Use this command to enable or disable priority-based flow control function on the interface.

#### Command Syntax

priority-flow-control mode ( on | auto )

no priority-flow-control

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| on | enable priority-based flowcontrol no matter how the peer configures | - |
| auto | enable priority-based flowcontrol negotiating with the peer | - |

#### Command Mode

Interface Configuration

#### Default

Enable priority-based flowcontrol on priority 3

### Usage

Use the priority-flow-control interface Configuration command to set the interface's ability to send pause frames to on or off on the specialed priorities.

### Examples

This example shows how to enable priority-based flowcontrol on the interface:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# priority-flow-control mode on
```

This example shows how to enable priority-based flowcontrol on the interface(auto negotiating with the peer):

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# priority-flow-control mode auto
```

### Related Commands

None

## 18.1.2 priority-flow-control enable priority

### Command Purpose

Use this command to enable or disable priority-based flow control function on which priority.

### Command Syntax

priority-flow-control enable priority { 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 }

no priority-flow-control enable priority { 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 }

### Command Mode

Interface Configuration

## Default

Enable priority-based flow control on priority 3

## Usage

Use the priority-flow-control enable priority interface Configuration command to set the interface's ability to send pause frames to on or off on which priorities.

This command is only supported on physical interfaces.

## Examples

This example shows how to enable priority-based flow control on which priorities:

```
Switch# configure terminal
Switch(config-if)# Priority-flow-control enable priority 2 3 5 7
```

## Related Commands

priority-flow-control mode (on | auto)

lldp tlv 8021-org-specific dcbx

# 18.1.3 show priority-flow-control

## Command Purpose

Use this command to display priority-based flowcontrol information.

## Command Syntax

show priority-flow-control ( *INTERFACE* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INTERFACE | Interface name | Support physical ports |

## Command Mode

Privileged EXEC

## Default

None

## Usage

Use the command to display priority-based flowcontrol admin-config and operation-config information of each port.

## Examples

This example shows how to display priority-based flowcontrol information:

```
Switch# show priority-flow-control interface eth-0-1
Switch# show priority-flow-control
Port             PFC-enable          PFC-enable on priority
               admin    oper        admin     oper
-----------------------------------------------------------------
eth-0-1        off      off         off       off
```

## Related Commands

None

# 18.1.4 show priority-flow-control statistics

## Command Purpose

Use this command to display priority-based flowcontrol statistics.

## Command Syntax

show priority-flow-control statistics ( *INTERFACE* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INTERFACE | Interface name | Support physical ports |

## Command Mode

Privileged EXEC

## Default

None

## Usage

Use the command to display priority-based flowcontrol statistics of each port.

## Examples

This example shows how to display priority-based flowcontrol statistics:

```
Switch# show priority-flow-control statistics interface eth-0-1
Switch# show priority-flow-control statistics
Port               RxPause          TxPause
-------------------------------------------------
eth-0-1            0                0
```

## Related Commands

None

# 18.1.5 priority-flow-control deadlock precision

## Command Purpose

Use this command to configure time precision for priority-based flowcontrol deadlock

## Command Syntax

priority-flow-control deadlock precision *PRECISION*

no priority-flow-control deadlock precision

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PRECISION | Precision in millisecond | 10-50 |

## Command Mode

Global Configuration

## Default

10

## Usage

Use the command to set time precision for priority-based flowcontrol deadlock

## Examples

This example shows how to configure priority-based flow control deadlock precision:

```
Switch# configure terminal
Switch(config)# priority-flow-control deadlock precision 20
None
```

This example shows how to revert the priority-based flow control deadlock precision to 10:

```
Switch# configure terminal
Switch(config)# no priority-flow-control deadlock precision
```

## Related Commands

None

# 18.1.6 priority-flow-control deadlock priority

## Command Purpose

Use this command to configure port priority-based flowcontrol deadlock detection

## Command Syntax

priority-flow-control deadlock priority *PRI1* ( *PRI2* | ) ( detect *DETECT* recover *RECOVER* | )

no priority-flow-control deadlock priority ( *PRI1* | ) ( *PRI2* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PRI1 | Traffic-priority value | 0-7 |
| PRI2 | Traffic-priority value | 0-7 |
| DETECT | Detect time | 2020/1/30 |

| | | |
|---|---|---|
| RECOVER | Recover time in millisecond | 0-3000 |

## Command Mode

Interface Configuration

## Default

Port priority-based flowcontrol deadlock detection is not configured by default

Detect time is 15 by default

Recover time is 150 by default

## Usage

Use the command to set port priority-based flowcontrol deadlock detection

## Examples

This example shows how to configure port priority-based flowcontrol deadlock detection:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# priority-flow-control deadlock priority 5 6 detect 20 recover
300
None
```

## Related Commands

None

# 18.1.7 priority-flow-control deadlock limit priority

## Command Purpose

Use this command to configure port priority-based flowcontrol deadlock limitation

## Command Syntax

priority-flow-control deadlock limit priority *PRI1* ( *PRI2* | ) ( frequency *FREQUENCY* period *PERIOD* | )

no priority-flow-control deadlock limit priority ( *PRI1* | ) ( *PRI2* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PRI1 | Traffic-priority value | 0-7 |
| PRI2 | Traffic-priority value | 0-7 |
| FREQUENCY | Frequency | 10-100000 |
| PERIOD | Period | 2020/1/5 |

## Command Mode

Interface Configuration

## Default

Port priority-based flowcontrol deadlock limitation is not configured by default

Frequency is 10 by default

Period is 1 by default

## Usage

Use the command to set port priority-based flowcontrol deadlock limitation

## Examples

This example shows how to configure port priority-based flowcontrol deadlock limitation:

```
Switch# configure terminal
Switch(config)# interface eth-0-1
Switch(config-if)# priority-flow-control deadlock limit priority 7 frequency 100
period 5
None
```

## Related Commands

None

## 18.1.8 show priority-flow-control deadlock status

### Command Purpose

Use this command to display priority-based flowcontrol deadlock status information

### Command Syntax

show priority-flow-control deadlock status

### Command Mode

Privileged EXEC

### Default

None

### Usage

Use the command to display priority-based flowcontrol deadlock status information

### Examples

This example shows how to display priority-based flowcontrol deadlock status information:

```
Switch# show priority-flow-control deadlock status
None
```

### Related Commands

None

## 18.1.9 show priority-flow-control deadlock statistics

### Command Purpose

Use this command to display priority-based flowcontrol deadlock statistics information

## Command Syntax

show priority-flow-control deadlock statistics ( interface *IFPHYSICAL* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFPHYSICAL | Physical interface | Support physical ports |

## Command Mode

Privileged EXEC

## Default

None

## Usage

Use the command to display priority-based flowcontrol deadlock statistics information

## Examples

This example shows how to display priority-based flowcontrol deadlock statistics information:

```
Switch# show priority-flow-control deadlock statistics interface eth-0-1
None
```

## Related Commands

None

# 18.1.10 clear priority-flow-control deadlock statistics

## Command Purpose

Use this command to clear priority-based flowcontrol deadlock statistics information

### Command Syntax

clear priority-flow-control deadlock statistics ( interface *IFPHYSICAL* | )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFPHYSICAL | Physical interface | Support physical ports |

### Command Mode

Privileged EXEC

### Default

None

### Usage

Use the command to clear priority-based flowcontrol deadlock statistics information

### Examples

This example shows how to clear priority-based flowcontrol deadlock statistics information:

```
Switch# clear priority-flow-control deadlock statistics interface eth-0-1
None
```

### Related Commands

None

## 18.2 EFD Commands

### 18.2.1 efd enable

### Command Purpose

Use this command to enable EFD detect on interface.Use the no form of this command to disable EFD detect on interface.

### Command Syntax

efd enable

no efd enable

### Command Mode

Interface Configuration

### Default

EFD detect is disabled

### Usage

When the rate of the flow is 60Mbps, this flow shall be a elephant flow.

### Examples

This example shows how to enable EFD on the interface:

```
Switch# configure terminal
Switch(config-if)# efd enable
```

### Related Commands

None

## 18.2.2 efd tcp-only enable

### Command Purpose

Use this command to enable detect EFD with TCP packet.Use the no form of this command to disable detect EFD with TCP.

### Command Syntax

efd tcp-only enable

no efd tcp-only enable

### Command Mode

Global Configuration

### Default

All flow will be detect

### Usage

None

### Examples

This example shows how to enable EFD on the interface:

```
Switch# configure terminal
Switch(config)# efd tcp-only enable
```

### Related Commands

None

## 18.2.3 efd detect speed

### Command Purpose

Use this command to set speed for flow detected as EFD.

### Command Syntax

efd detect speed *SPEED*

efd detect speed

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SPEED | Detect speed, Mbps. | 1-10000 |

### Command Mode

Global Configuration

### Default

50Mbps

### Usage

None

### Examples

This example shows how to set 60Mbps detect for EFD flow:

```
Switch# configure terminal
Switch(config)# efd detect speed 60
```

### Related Commands

None

## 18.2.4 efd detect granularity

### Command Purpose

Use this command to set the granularity of calculate the detect rate.The greater the granularity, the greater the quantized error.

### Command Syntax

efd detect granularity ( *4B* | *8B* | *16B* | *32B* )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| 4B\|8B\|16B\|32B | Granularity, default 16B. | 4B\|8B\|16B\|32B |

### Command Mode

Global Configuration

### Default

16B

### Usage

(Rate * Interval) >> Granularity, the value's bit is fixed.

### Examples

This example shows how to set 32B granularity:

```
Switch# configure terminal
Switch(config)# efd detect granularity 32B
```

### Related Commands

None

## 18.2.5 efd detect time-interval

### Command Purpose

Use this command to set the the time interval for flow as detected as EFDs.

### Command Syntax

efd detect time-interval *INTERVAL*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| INTERVAL | Time interval in ms(10ms - 100000ms, default value is 30ms) | 10-100000 |

### Command Mode

Global Configuration

### Default

30ms

### Usage

None

### Examples

This example shows how to set time interval to 100ms:

```
Switch# configure terminal
Switch(config)# efd detect time-interval 100
```

### Related Commands

None

## 18.2.6 efd detect min-pkt-size

### Command Purpose

Use this command to set flow color for flow detected as EFD.Use the no form of this command to unset flow color for flow detected as EFD.

### Command Syntax

efd detect min-pkt-size *SIZE*

no efd detect min-pkt-size

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SIZE | Configure minimum packet size, unit is byte | 64-9216 |

### Command Mode

Global Configuration

### Default

Disabled

### Usage

unit is byte.

### Examples

This example shows how to set elephant flowminimum packet size with 300:

```
Switch# configure terminal
Switch(config)# efd detect min-pkt-size 300
```

### Related Commands

show efd configuration

## 18.2.7 efd aging-period

### Command Purpose

Use this command to set flows detected as EFDs aging period.

### Command Syntax

efd aging-period *PERIOD*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| PERIOD | Aging period, configure 2 ~ 7 times of configured detect time-interval, default value is 4 | 2-7 |

### Command Mode

Global Configuration

### Default

4

### Usage

The aging time is the detect rate multiple aging period.

### Examples

This example shows how to set aging period to 3:

```
Switch# configure terminal
Switch(config)# efd aging-period 3
```

### Related Commands

None

## 18.2.8 efd redirect to interface

### Command Purpose

Use this command to redirect the flows detected as EFD to the specified interface.

### Command Syntax

efd redirect to interface *IFNAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFNAME | The interface to redirect to | Support physical/aggregation ports |

### Command Mode

Global Configuration

### Default

Disable

### Usage

None

### Examples

This example shows how to redirect the flows to interface eth-0-2:

```
Switch# configure terminal
Switch(config)# efd redirect to interface eth-0-2
```

### Related Commands

None

## 18.2.9 efd ipg enable

### Command Purpose

Use this command to set calculate the detect rate whether use the packet's ipg.Use the no form of this command to unset calculate the detect rate whether use the packet's ipg.

### Command Syntax

efd ipg enable

no efd ipg enable

### Command Mode

Global Configuration

### Default

Disable

### Usage

None

### Examples

This example shows how to enable the calculate the detect rate with ipg:

```
Switch# configure terminal
Switch(config)# efd ipg enable
```

### Related Commands

None

## 18.2.10 efd notify enable

### Command Purpose

Use this command to configure EFD notify function.Use the no form of this command to unconfigure EFD notify function.

### Command Syntax

efd notify enable *IP_ADDR* ( *PORT* | )

no efd notify enable

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IP_ADDR | IP address of the server | IPv4 Address |
| PORT | UDP port used by server | 1-65535 |

### Command Mode

Global Configuration

### Default

The feature is disabled.

The default UDP port is 20007 if not specifed.

### Usage

After EFD notify enabled, the new elephant flow will be notified to server, the format of the data in the UDP packet is:

|—-rsv—- | ver| code|

|———length———-|

|—type—-|——len—-|

|———-value———-|

.....

### Examples

This example shows how to configure EFD notify:

```
Switch# configure terminal
Switch(config)# efd notify enable 10.10.10.1
```

### Related Commands

efd enable

efd notify packet

## 18.2.11 efd notify packet

### Command Purpose

Use this command to configure EFD notify carry original packet.Use the no form of this command to unconfigure EFD notify carry original packet.

### Command Syntax

efd notify packet

no efd notify packet

### Command Mode

Global Configuration

### Default

Disabled

### Usage

None

### Examples

This example shows how to configure EFD notify carry original packet:

```
Switch# configure terminal
Switch(config)# efd notify packet
```

### Related Commands

efd enable

efd notify enable

## 18.2.12 efd black-hole-route gw

### Command Purpose

Use this command to enable EFD black hole route, specify the gateway address and route tag.Use the no form of this command to disable EFD black hole route, unspecify the gateway address and route tag.

### Command Syntax

efd black-hole-route gw *IP_ADDR* ( | tag *TAG_VALUE* )

no efd black-hole-route

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IP_ADDR | Gateway address of black hole route | IPv4 Address |
| TAG_VALUE | Tag of black hole route | 0-4294967295 |

### Command Mode

Global Configuration

### Default

None

### Usage

Enable EFD black hole route feature, a black hole route would be created for it when a flow

is detected as elephant flow, it's next-hop would be pointed to the configured gateway address.

### Examples

This example shows how to enable efd black hole route:

```
Switch# efd black-hole-route gw 1.2.3.4 tag 876
```

### Related Commands

show efd bhr information detail

## 18.2.13 efd black-hole-route aging-timer

### Command Purpose

Use this command to set black hole route aging time.Use the no form fo this command to unset black hole route aging time.

### Command Syntax

efd black-hole-route aging-timer ( 0 | value )

no efd black-hole-route aging-timer ( 0 | *VALUE* )

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| 0 | Never aging | - |
| VALUE | The black hole route aging time | 10-1000000 seconds |

### Command Mode

Global Configuration

### Default

300

### Usage

None

### Examples

This example shows how to set aging time:

```
Switch# efd black-hole-route aging-timer 1000
```

### Related Commands

None

## 18.2.14 efd syslog enable

### Command Purpose

Use this command to set the efd detect information.Use the no form of this command to unset the efd detect information.

### Command Syntax

efd syslog enable

no efd syslog enable

### Command Mode

Global Configuration

### Default

Enable

### Usage

None

### Examples

This example shows how to set the efd detect information:

```
Switch# efd syslog enable
```

### Related Commands

None

## 18.2.15 show efd bhr information

### Command Purpose

Use this command to display the information about efd black hole route.

### Command Syntax

show efd bhr information ( detail | )

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to display the information about efd black hole route:

```
Switch# show efd bhr information detail
Elephant flow detection BHR configuration information:
 * BHR - Black Hole Route
-------------------------------------------------
Auto install BHR       : Enabled
BHR gateway            : 1.2.3.4
BHR count              : 1
BHR aging timer        : 300
BHR route tag          : 876
--------------------------
BHR Prefix, Age Time    :
--------------------------
  12.12.12.2/32, 1 min
```

### Related Commands

efd black-hole-route gw

efd black-hole-route aging-timer

## 18.2.16 show efd configuration

### Command Purpose

Use this command to display the configuration of efd.

### Command Syntax

show efd configuration

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to display the configuration of efd:

```
Switch# show efd configuration
Elephant flow detection configuration information:
-------------------------------------------------
Detect rate                : 50 Mbps
Detect granularity         : 16B
Detect time interval       : 30 ms
Black-hole-route gateway   : 0.0.0.0
Black-hole-route tag       : 0
Black-hole-route aging time: 0
EFD syslog                 : Enable
EFD aging period           : 4 times
EFD aging time             : 120 ms ~ 150 ms
```

```
EFD detect packet type     : All IP packets
EFD IPG                    : disable
EFD redirect interface     : N/A
EFD flow-traffic-class     : N/A
EFD flow-color             : N/A
EFD notify                 : 1.2.3.4 20007
EFD notify packet          : disable
EFD min-pkt-size           : disable
EFD flow hash fields       : source-ip
                             destination-ip
                             ip-protocol
                             layer4-source-port
                             layer4-destination-port
EFD enabled interface      :
--------------------------- ---------------------------
eth-0-1                    eth-0-9
eth-0-10                   agg5
```

### Related Commands

None

## 18.2.17 show efd flow table

### Command Purpose

Use this command to display the efd flow hardware information.

### Command Syntax

show efd flow table

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

## Examples

This example shows how to display the efd flow hardware information:

```
Switch# show efd flow table
Current elelphant flow number is 0, valid bit count is 0
Flow Entry Status:    'V'  --- Valid,      '.'  ---  Not Valid
FlowId        - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
(00)0000~0031 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
(01)0032~0063 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
(02)0064~0095 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
(03)0096~0127 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
(04)0128~0159 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
(05)0160~0191 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
(06)0192~0223 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
```

## Related Commands

None

# 18.2.18 show efd flow information

## Command Purpose

Use this command to display EFD flow information.

## Command Syntax

show efd flow information

## Command Mode

Privileged EXEC

## Default

None

## Usage

None

### Examples

This example shows how to display EFD flow information:

```
Switch# show efd flow information
```

### Related Commands

None

## 18.2.19 clear efd flow information

### Command Purpose

Use this command to clear EFD flow information.

### Command Syntax

clear efd flow information

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

This example shows how to clear EFD flow information:

```
Switch# clear efd flow information
```

### Related Commands

None

# 19 Stacking Commands

## 19.1.1 stack enable/disable

### Command Purpose

Use this command to enable or disable stacking.Restart to take effect.

### Command Syntax

stack （enable | disable）

### Command Mode

Global Configuration.

### Default

stacking disable is specified by default.

### Usage

After enabling stack or disabling stack and rebooting.

### Examples

The following example enable stacking:

```
Switch(config)# stack enable
```

The following example disable stacking:

```
Switch(config)# stack disable
```

## 19.1.2 stack slotid

### Command Purpose

Use this command to set the slotid of stacking.Use the no parameter with this command to cancle the slot id configuration.

### Command Syntax

stack slotid *SLOTID*

no stack slotid

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SLOTID | A string that specifies the value of slotid | <1-16> |

### Command Mode

Global Configuration.

### Default

stack slot is not specified by default.

### Usage

After configuring stack slotid and rebooting, the port-related configuration will be cleared.

### Examples

The following example configure Stack Slot ID:

```
Switch(config)# stack slotid 2
```

## 19.1.3 stack priority

### Command Purpose

Use this command to set the priority of stacking member.the higher the value the higher the priority.In stacking role negotiation will based on member between priority and MAC address size.

Restart to take effect.

### Command Syntax

stack slotid ( *SLOTID* ) priority *PRIORITY*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SLOTID | A string that specifies the value of slotid | <1-16> |
| PRIORITY | specifies the value of priority, min to 1,max to 255 | <1-255> |

### Command Mode

Global Configuration

### Default

default priority is 100.

### Usage

None

### Examples

```
Switch# configure terminal
Switch(config)# stack slotid 1 priority 255
```

### Related Commands

None

## 19.1.4 stack domainid

### Command Purpose

Use this command to set the domainid of stacking member. Members with different domain ID cannot topology discover each other in the network. Stacking supports domain management.

### Command Syntax

stack domainid <0-65535>

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| domainid | A string that specifies the value of domainid | <0-65535> |

### Command Mode

Global Configuration

### Default

default domainid is 0.

### Usage

None

### Examples

```
Switch(Master:1)(config)# stack domainid 10
% configuration will not take effect until save configuration and system reload.
```

### Related Commands

None

## 19.1.5 interface IFSTACK

### Command Purpose

Use this command to create stacking port and interface the configure mode view.

Use the no parameter with this command to remove the stacking port.

### Command Syntax

interface *stack-*

no interface *stack-*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SLOTID | Specifies the slotid | <1-16> |
| Trunkid | Specifies the stacking port trunkid | <1-16> |

### Command Mode

Global Configuration.

### Default

IFSTACK is not specified by default.

### Usage

In the same stacking domain system, both Slot ID and Trunk ID are unique. Each stacking member switch can have a maximum of two stacking ports, which are distinguished by Trunk IDs. The Trunk IDs of directly connected stack ports must be the same, but their Slot IDs must be different. If there is a duplicate Trunk ID, the later connected stack port will fail to join the stacking system. For example, if Switch 1 and Switch 2 have already configured a stack port with Trunk ID 1 using the command "interface stack-0-1", other member switches in the same stacking system are not allowed to configure stack ports with Trunk ID 1 anymore.

## Examples

The following example create stacking port:

```
Switch(config)# interface stack-2-1
```

## Related Commands

None

# 19.1.6 member-port

## Command Purpose

Use this command to configure a physical port as a stacking member port.

Use the no parameter with this command to remove the stacking port.

## Command Syntax

member-port *IFPHYSICAL*

no member-port *IFPHYSICAL*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFPHYSICAL | Physical port | N/A |

## Command Mode

Interface Configuration.

## Default

IFPHYSICAL is not specified by default.

## Examples

The following example configure a physical port as a stacking member port:

```
switch(config)# interface stack-2-1
switch(config-if)# member-port eth-2-49
It may take a few seconds, please wait.......
switch(config-if)# member-port eth-2-50
It may take a few seconds, please wait.......
```

## 19.1.7 local-preference enable

### Command Purpose

Use this command to configure a linkagg port enable local-preference forwarding.

Use the no parameter with this command to rconfigure a linkagg port disable local-preference forwarding.

### Command Syntax

local-preference enable

no local-preference enable

### Command Mode

Interface Configuration.

### Default

Linkagg port is local-preference forwarding by default.

### Notice

Command can only be configured and take effect on a stacking system.

### Examples

The following example configure a linkagg port enable local-preference forwarding:

```
Switch(Master:1)(config)# interface agg 10
Switch(Master:1)(config-if)# local-preference enable
```

## 19.1.8 show stack

### Command Purpose

Use this command to display stacking basic information.

## Command Syntax

show stack

## Command Mode

User EXEC

## Default

None

## Usage

None

## Examples

```
Switch(Master:1)# show stack
Stack domainID: 0
SlotID              Role                  MAC                          State
     priority
=============================================================================
     1              Master  d85b:2208:5592         Run                  100
     2              Slave   d85b:2208:55d6         Run                  100
     3              Slave   649d:9932:5385         Run                  100
     4              Slave   d85b:2200:0423         Run                  100
The System MAC of the Stacking is:d85b:2208:5592
```

## Related Commands

None

# 19.1.9 show stack link

## Command Purpose

Use this command to display stacking trunk and member status information.

## Command Syntax

show stack link

## Command Mode

User EXEC

## Default

None

## Usage

None

## Examples

```
Switch(Master:1)# show stack link
Stack Interface     Status          Member                 Member Status
=====================================================================
Stack-01-01         up                    eth-01-49              up
Stack-01-04         up                    eth-01-50              up
Stack-02-01         up                    eth-01-49              up
Stack-02-02         up                    eth-01-50              up
Stack-03-02         up                    eth-01-29              up
Stack-03-03         up                    eth-01-30              up
Stack-04-04         up                    eth-01-26              up
Stack-04-03         up                    eth-01-25              up
```

## Related Commands

None

# 19.1.10 show stack topology

## Command Purpose

Use this command to display the simple stacking topology information.

## Command Syntax

show stack topology

## Command Mode

User EXEC

## Default

None

## Usage

None

## Examples

```
Switch(Master:1)# show stack topology
  M          S          S          S          M
+-----+    +-----+    +-----+    +-----+    +-----+
|  1  | 1*** 1|  2  | 3*** 3|  3  | 4*** 4|  4  | 2*** 2|  1  |
+-----+    +-----+    +-----+    +-----+    +-----+

Known Ucast Forward:
SlotID  Stack-Interface  Remote-SlotID
==========================================
   1     stack-1-1            2
   1     stack-1-1            3
   1     stack-1-2            4

Switch(Master:1)#
```

## Related Commands

None

# 19.1.11 stack connect slot

## Command Purpose

Use this command to connect to the specified stack device.

## Command Syntax

stack connect slot *SLOTID*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| SLOTID | value of slotid | <1-16> |

### Command Mode

User EXEC

### Default

None

### Usage

None

### Examples

```
Switch# stack connect slot 2
```

### Related Commands

None

## 19.1.12 stack dual-active detect mode direct

### Command Purpose

Use this command to configure stack dual-active detect mode direct mode.

### Command Syntax

stack dual-active detect mode direct

no stack dual-active detect mode direct

### Command Mode

Interface Configuration

### Default

stack dual-active detect mode direct is not set by default.

## Usage

Perform dual-active detect mode direct on the links connected between stacking member switches through common physical ports, and configure them on the common physical ports

## Examples

```
Switch(Master:1)(config)# interface eth-1-3
Switch(Master:1)(config-if)# stack dual-active detect mode direct
Warning: The interface will block common data packets, continue? [no]y
```

## Related Commands

None

# 19.1.13 stack dual-active detect reserved interface

## Command Purpose

Use this command to configure stack dual-active detect reserved interface. If the dual-active detection of the competing master fails, all ports except for the stacking port and the reserved port will be Error Down.

## Command Syntax

stack dual-active detect reserved interface

no stack dual-active detect reserved interface

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| IFPHYSICAL/IFAGG | Physical port/Linkagg port | N/A |

## Command Mode

Global Configuration.

## Default

stack dual-active detect reserved interface is not set by default.

### Usage

None

### Examples

```
Switch(Master:1)(config)# stack dual-active detect reserved interface eth-1-9
```

### Related Commands

None

## 19.1.14 show stack dual-active

### Command Purpose

Use this command to display the stacking dual-active information.

### Command Syntax

show stack dual-active

### Command Mode

User EXEC

### Default

None

### Usage

None

### Examples

```
Switch(Master:1)# show stack dual-active
Stack domainID: 0
Dual-active status: Normal
Dual-active detect mode: Direct
Dual-active detect interface configured:
eth-1-2                    up
```

```
eth-1-3                      up
eth-1-4                      up
eth-4-1                      up
eth-4-2                      up
eth-4-3                      up
eth-2-3                      up
eth-2-1                      up
eth-2-4                      up
eth-3-1                      up
eth-3-2                      up
eth-3-4                      up
Dual-active reserved interface onfigured:
eth-1-9                      up
```

### Related Commands

None

## 19.1.15 copy

### Command Purpose

To copy file system, use the copy command in Privileged EXEC mode. The stacking system supports copying images to all stacking member devices once.

### Command Syntax

copy source-name destination-name

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| source-name | The location URL of the source file to be copied. The source can be either local or remote | - |
| destination-name | The destination URL of the copied file. The destination can be either local or remote | - |

### Command Mode

Privileged EXEC

## Default

None

## Usage

The exact format of the source and destination URLs varies according to the file or directory location. You may enter a particular file or a filename that follows the standard file system syntax (filesystem:[/filepath][/filename]).

## Examples

The following example shows how to get image from TFTP server through in band management interface:

```
Switch(Master:1)# copy mgmt-if tftp://192.168.2.248/stack-vastlakes-v3.1.0.3.bin ?
  flash:                          Copy to local file
  udisk:                          Copy to local file
  slot16#flash:             Copy to local file
  slot16#boot:              Copy to local file
  slot3#flash:              Copy to local file
  Slot3#boot:                     Copy to local file
  slotall#flash:            Copy to local file
  slotall#boot:             Copy to local file
  startup-config            Copy to startup system configuration
```

Copy to all stack members:

```
Switch(Master:1)# copy mgmt-if tftp://192.168.2.248/stack-vastlakes-v3.1.0.3.bin
slotall#flash:boot/stack-vastlakes-v3.1.0.3.bin
Are you sure to overwrite flash:/boot/stack-vastlakes-v3.1.0.3.bin? [confirm]y
Download from URL to temporary file
Get file from tftp://192.168.2.248/stack-vastlakes-v3.1.0.3.bin
.....................................................................................
.....................................................................................
.....................................................................................
.....................................................................................
.....................
Recieved 37452541 bytes in 9.7 seconds
Copy the temporary file to /mnt/slot16/flash/boot/stack-vastlakes-v3.1.0.3.bin
.....................................................................................
.....................................................................................
.....................................................................................
.....................................................................................
.................................
37452541 bytes in 7.1 seconds, 5151 kbytes/second
Copy the temporary file to /mnt/slot3/flash/boot/stack-vastlakes-v3.1.0.3.bin
.....................................................................................
.....................................................................................
.....................................................................................
```

. . . . . .

## 19.1.16 boot system

### Command Purpose

To specify the system image that the switch loads at startup, use the following boot system commands in Privileged EXEC mode. The stacking system supports specify the images to all stacking member devices once.

### Command Syntax

boot system ( *tftp:* mgmt-if *SERVERIP* | *flash:/* ) *FILE_NAME*

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| flash:/ | System image file for next booting | - |
| tftp | System image file for next booting | - |
| mgmt-if | Management port | - |
| SERVERIP | The tftp server ip | - |
| FILE_NAME | The file name that will be used to load at startup | The full path and file name , up to 255 characters |

### Command Mode

Privileged EXEC

### Default

None

### Usage

Management IP address in startup-config file will be used as source address when system boot via TFTP.

### Examples

The following example is sample dialog from the boot system command:

```
Switch(Master:1)# boot system flash:/boot/stack-vastlakes-v3.1.0.3.bin slot all
Are you sure to use flash:/boot /stack-vastlakes-v3.1.0.3.bin as the next boot
image for slot all? [confirm]y
```

### Related Commands

show boot

## 19.1.17 show boot

### Command Purpose

To display the current image and the image the next startup will load, use the show boot command in Privileged EXEC mode.

### Command Syntax

show boot

### Command Mode

Privileged EXEC

### Default

None

### Usage

None

### Examples

The following is sample output from the show boot command:

```
Switch(Master:1)# show boot
boot information on slot1:
The current boot image version is: S5548PB-3.1.0.2
```

```
The current running image is: flash:/boot/stack-vastlakes-v3.1.0.2.bin
The next time boot image version is: v3.1.0.3
The next running image is: flash:/boot/stack-vastlakes-v3.1.0.3.bin
boot information on slot3:
The current boot image version is: s5612x-3.1.0.2
The current running image is: flash:/boot/stack-vastlakes-v3.1.0.2.bin
the next time boot image version is: v3.1.0.3
The next running image is: flash:/boot/stack-vastlakes-v3.1.0.3.bin
boot information on slot16:
The current boot image version is: s5612x-3.1.0.2
The current running image is: flash:/boot/stack-vastlakes-v3.1.0.2.bin
the next time boot image version is: v3.1.0.3
The next running image is: flash:/boot/stack-vastlakes-v3.1.0.3.bin
```

### Related Commands

show boot images

## 19.1.18 write memory

### Command Purpose

To save the current configuration information to stacking system members

### Command Syntax

write memory (all slot | slotid)

| Parameter | Parameter Description | Parameter Value |
|---|---|---|
| memory | save the configuration to the NVRAM of the all stacking system members | - |
| all slot | save the configuration to the NVRAM of the all stacking system members | - |
| slotid | save the configuration to the NVRAM of specified slot | slot id of the member in the stacking system |

### Command Mode

Privileged EXEC

## Default

None

## Usage

you can modify the current configuration of the device through the cli, but the configuration is temporary. If you want to use the current configuration, it will take effect when the system restarts the next time.You need to save the current configuration to the configuration file before restarting the device

## Examples

This example shows how to save the current configuration:

```
Switch(Master:1)# write memory
Building configuration...
[OK]
Switch(Master:1)# write memory slot all
Warning: stack will save startup info to all online slave device!
[OK]
Switch(Master:1)# write memory slot ?
  <1,3,16>          The available slot
  all               Member all
Switch(Master:1)# write memory slot 3
warning: stack will save startup info to 3 device!
[OK]
```

## Related Commands

None

# 19.1.19 reboot/reload slot

## Command Purpose

To reload the whole stacking system or specified stacking member, use the reload command in Privileged EXEC mode.

## Command Syntax

reboot/reload slot (all | slotid)

## Command Mode

Privileged EXEC

## Default

None

## Usage

The reboot command halts the system. Use the reboot command after configuration information is entered into a file and saved to the startup configuration.

## Examples

```
Switch(Master:1)# reboot slot ?
<1,3,16>            The available slot
all                 Member all
Switch(Master:1)# reboot slot all?
  all                       Member all
Switch(Master:1)# reload slot all
Make sure that all slots will boot with the same image. [confirm]y

Building configuration...
Reboot system? [confirm]y
```

## Related Commands

None