FIBERROAD

Ethernet Switch
Command Line Interface
User Manual

About This Manual

Introduction

This chapter describes how to use the command line to configure Fiberroad's managed Ethernet switches. Besides the web interface configuration, the command line interface helps system administrators easily and quickly manage, monitor, and configure Fiberroad's managed Ethernet switch.

Conventions

This document contains notices, figures, screen captures, and certain text conventions.

Figures and Screen Captures

This document provides figures and screen captures as examples. These examples contain sample data. This data may vary from the actual data on an installed system.

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1
About Command Line Interface

This chapter helps users to understand the command line interface, and demonstrates a general ideal on the command line operation.

The following topics are covered in this chapter:

1.1 Accessing the Switch

Users can connect to the switch using one of two method: by console or by Telnet

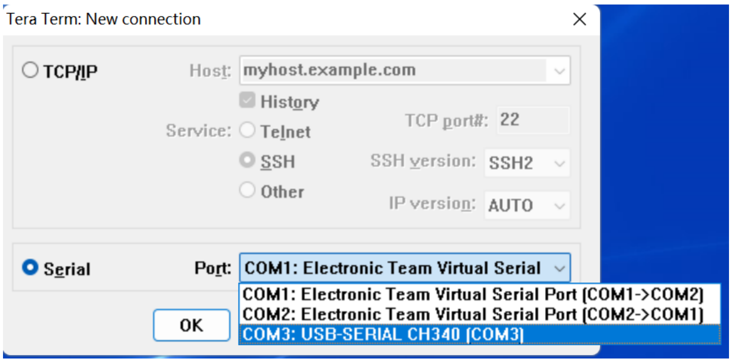
1.1.1 Logging in using the RS-232 Console

1, Prepare the included RS-232 serial cable with RJ45 interface

2, Connect the RJ45 interface end to the console port on the switch, and the other end to the computer.

3, Select one of the Serial Terminal Emulator. As to this manual, We utilized "Tera Term" as an example.

4, Select Serial and Connected Com Port



Tera Term: New connection

○ TCP/IP   Host: myhost.example.com

☑ History

Service: ○ Telnet   TCP port#: 22

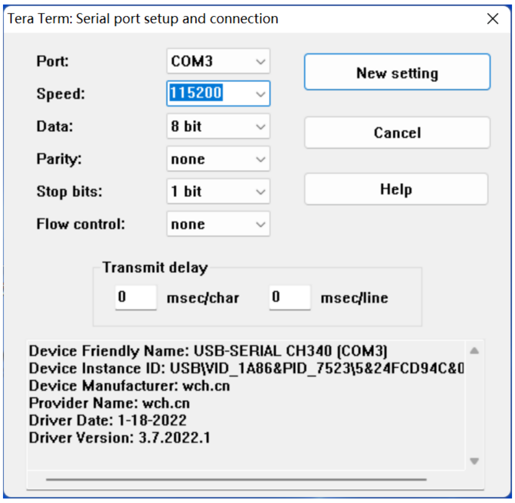
● SSH   SSH version: SSH2

○ Other   IP version: AUTO

● Serial   Port: COM1: Electronic Team Virtual Serial

COM1: Electronic Team Virtual Serial Port (COM1->COM2)
COM2: Electronic Team Virtual Serial Port (COM2->COM1)
COM3: USB-SERIAL CH340 (COM3)

5, Click **Setup**>**Serial Port** to establish a new connection



Tera Term: Serial port setup and connection

Port: COM3
Speed: 115200
Data: 8 bit
Parity: none
Stop bits: 1 bit
Flow control: none

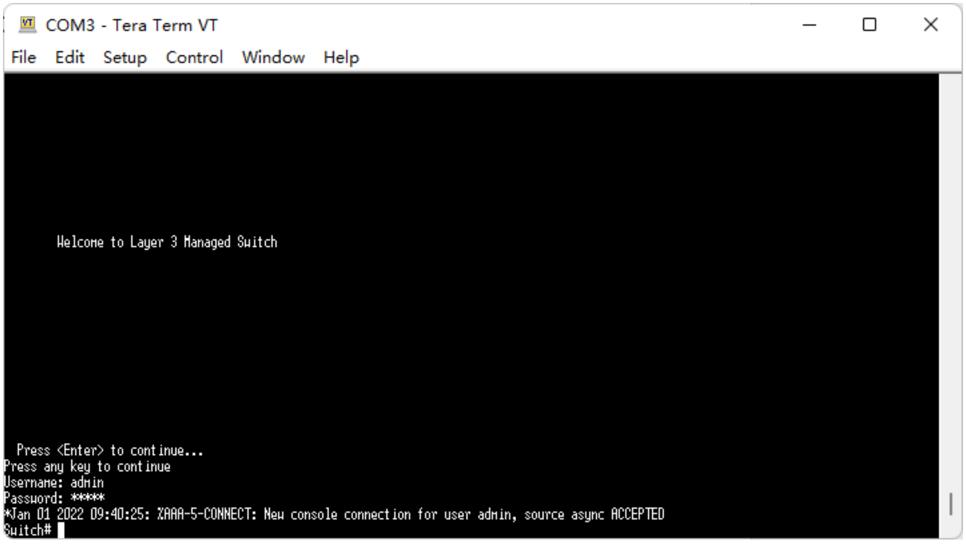
Transmit delay
0 msec/char 0 msec/line

Device Friendly Name: USB-SERIAL CH340 (COM3)
Device Instance ID: USB\VID_1A86&PID_7523\5&24FCD94C&0
Device Manufacturer: wch.cn
Provider Name: wch.cn
Driver Date: 1-18-2022
Driver Version: 3.7.2022.1

6, On the **Serial Port Setup and connection parameter** tab, select the COM port will be used for the console connection. Configure the field as follow: **115200** for **Speed(Baud rate)**, **8 bit** for **Data**, **None** for **Parity**, and **1** for **Stop bits**.

7, Click **New setting** to return to interface

8, Log in the console using the default login name **admin** and password **admin.** This password will be required to access any of the consoles (web, serial, telnet)



```
      Welcome to Layer 3 Managed Switch



 Press <Enter> to continue...
Press any key to continue
Username: admin
Password: *****
*Jan 01 2022 09:40:25: %AAA-5-CONNECT: New console connection for user admin, source async ACCEPTED
Switch#
```

9, When successfully connected to the switch, you can start configuring the switch parameters by using command line instructions.

NOTE: By default, the password assigned to the Fiberroad Switch is admin. We recommended changing the default password after logging in for the first time to help keep your system secure.

1.1.2 Logging in using Telnet

Opening the web console over a network requires that the PC host and Fiberroad switch are on the same logical subnet. You may need to adjust your PC host's IP address and subnet mask. By default, the Fiberroad switch's IP address is **192.168.1.6** and subnet mask is **255.255.255.0**. Your PC's IP address must be configured with an IP in the 192.168.1.xxx and a subnet mask 255.255.255.0.

NOTE: When connecting to the Fiberroad switch through Telnet or the web console, first connect one of the Fiberroad switch's Ethernet ports to your Ethernet LAN, or directly to your PC's Ethernet port. You may use either a straight-through or cross-over Ethernet cable.

After making sure that the Fiberroad switch is connected to the same LAN and logical subnet as your PC, open the Fiberroad switch's Telnet console as follows:
1, In Windows, Click Start > Run
2, In the Windows Run window, enter telnet followed by the Fiberroad Switch's IP address (192.168.1.6), You can also issue the Telnet command from a DOS prompt.

3. Log in to the Telnet console using the default login name admin and password admin. This pass will be required to access any of the console(Web, serial, telnet).

4. When success fully connected to the switch, you can start configuring the switch parameters by using command line instruction.

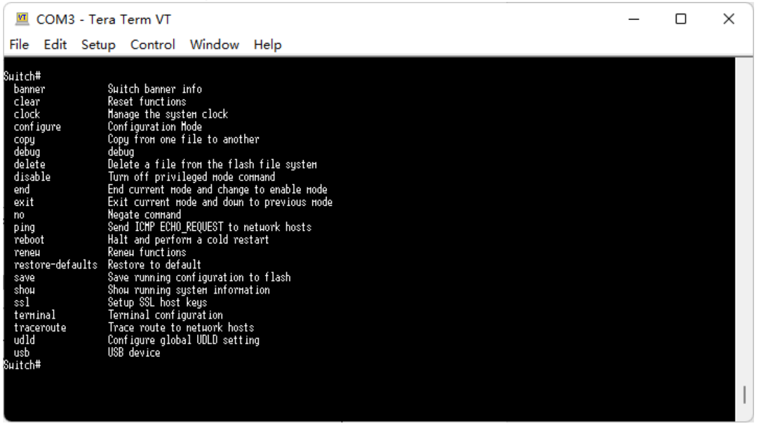
NOTE: By default, the password assigned to the Fiberroad Switch is admin. We recommended changing the default password after logging in for the first time to help keep your system secure.

1.2 Command Modes

1.2.1 Basic Configuration

The Command Line Interface(CLI) for Fiberroad's Managed switched can be accessed through either the serial console or the Telnet console. For either type of connection, access to the CLI is generally referred to as an EXEC session.

The CLI is organized using different configuration levels. When you first enter the CLI, type "?" to view a list of basic commands and a description of each function. Type any of commands shown on the screen to access the next configuration level. The help panel can be accessed from any configuration level by typing "?". The switch will show all the command for the current configuration mode.



```
Switch#
  banner            Switch banner info
  clear             Reset functions
  clock             Manage the system clock
  configure         Configuration Mode
  copy              Copy from one file to another
  debug             debug
  delete            Delete a file from the flash file system
  disable           Turn off privileged mode command
  end               End current mode and change to enable mode
  exit              Exit current mode and down to previous mode
  no                Negate command
  ping              Send ICMP ECHO_REQUEST to network hosts
  reboot            Halt and perform a cold restart
  renew             Renew functions
  restore-defaults  Restore to default
  save              Save running configuration to flash
  show              Show running system information
  ssl               Setup SSL host keys
  terminal          Terminal configuration
  traceroute        Trace route to network hosts
  udld              Configure global UDLD setting
  usb               USB device
Switch#
```

1.2.2 Understanding All Command Modes

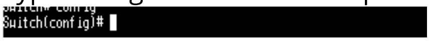
The Fiberroad switch's CLI supports multiple types of configuration levels for performing different functions. Refer to the following table for an overview of all available modes.

Mode	Access Method	Prompt	Exit Method	About This Mode
User EXEC	Begin a new session And login as user	Switch>	Enter the exit command. This will return you to the previous configuration mode.	Use this mode to display system information.
Privileged EXEC	Begin a session and login as admin.	switch #	Enter the exit command. This will return you to the previous login interface.	Use this mode to verify commands that you have entered.
Global	Enter the configure	switch (config)#	Enter the exit	Use this mode to

Configuration	command while in Privileged EXEC mode		command. This will return you to the previous configuration mode.	configure parameters that will apply to the entire switch.
Interface Configuration	While in global configuration mode, enter the interface command, followed by an interface identification.	switch (config-if)#	Enter the exit command. This will return you to the previous configuration mode.	Use this mode to configure parameters for the specified interface.

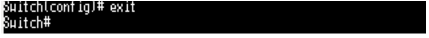
Refer to the following example of changing configuration modes below.

Type config at the command prompt to enter configuration mode.



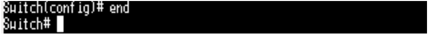
```
Switch# config
Switch(config)# █
```

Type exit to return to the previous configuration mode.



```
Switch(config)# exit
Switch#
```

Type end from within any configuration level to return to privileged mode.



```
Switch(config)# end
Switch# █
```

1.3 Help Messages

The CLI support several types of interactive commands. The Help commands are listed in the following table

Command	Purpose
?	Shows a brief description of the Help feature in any command level.
Partial command?	Shows a list of commands that begin with the entered character string. There should be no space between the command and the question mark.
Partial command<Tab>	Completes a partially entered command name. There should be no space between the command and <Tab>.
Command ?	Shows the keywords, arguments, or both associated with the command. There should be a space between the command and the question mark.
Command keyword ?	Shows the arguments that are associated with the keyword There should be a space between the command and the keyword, and between the keyword and the question mark.

1.4 Special Usage and Limitations

1. If the command contains any special characters, such as *, #, and %, you need to use the quotation marks (“ ”) to cover these special characters. Refer to the

following figure for an example.

2. You may use a semicolon mark(;) to separate several commands. Refer to the figure below for an example.

1.5 Abbreviated Commands

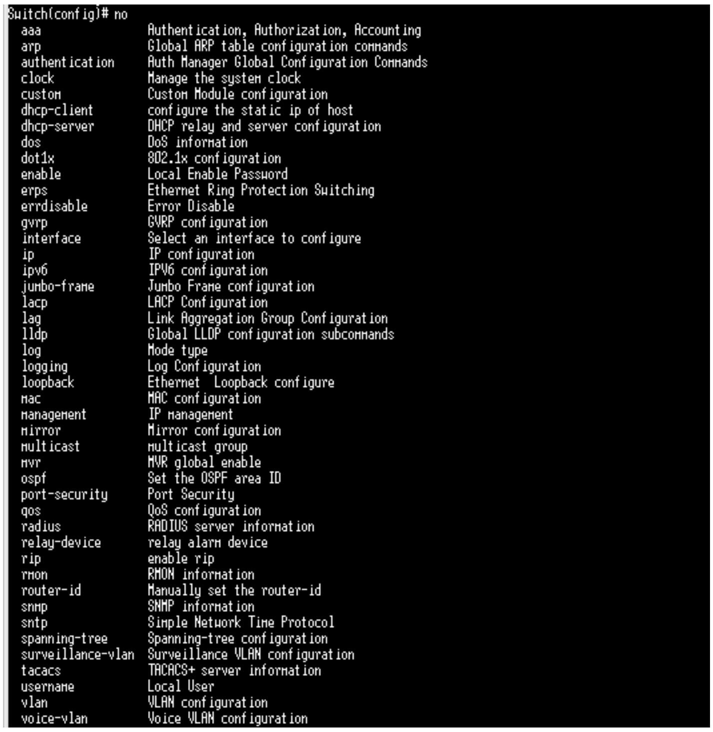
1. The exclamation mark " ! " can be used to enter the global configuration mode , as shown in the example below

2. You can input one or more letters to quickly see all commands starting with these letters. For example, type c?, all commands starting with c will be shown.

3. When press tab after typing the prefix letter, the syntax of the command starting with that letter will be shown.

1.6 No and Default Forms of Commands

A " no " command can used to perform the "delete", "disable", or "reset to default" functions. Type "no ?" to check how parameters can be used.



```
Switch(config)# no
  aaa                 Authentication, Authorization, Accounting
  arp                 Global ARP table configuration commands
  authentication      Auth Manager Global Configuration Commands
  clock               Manage the system clock
  custom              Custom Module configuration
  dhcp-client         configure the static ip of host
  dhcp-server         DHCP relay and server configuration
  dos                 DoS information
  dot1x               802.1x configuration
  enable              Local Enable Password
  erps                Ethernet Ring Protection Switching
  errdisable          Error Disable
  gvrp                GVRP configuration
  interface           Select an interface to configure
  ip                  IP configuration
  ipv6                IPV6 configuration
  jumbo-frame         Jumbo Frame configuration
  lacp                LACP Configuration
  lag                 Link Aggregation Group Configuration
  lldp                Global LLDP configuration subcommands
  log                 Mode type
  logging             Log Configuration
  loopback            Ethernet  Loopback configure
  mac                 MAC configuration
  management          IP management
  mirror              Mirror configuration
  multicast           multicast group
  mvr                 MVR global enable
  ospf                Set the OSPF area ID
  port-security       Port Security
  qos                 QoS configuration
  radius              RADIUS server information
  relay-device        relay alarm device
  rip                 enable rip
  rmon                RMON information
  router-id           Manually set the router-id
  snmp                SNMP information
  sntp                Simple Network Time Protocol
  spanning-tree       Spanning-tree configuration
  surveillance-vlan   Surveillance VLAN configuration
  tacacs              TACACS+ server information
  username            Local User
  vlan                VLAN configuration
  voice-vlan          Voice VLAN configuration
```

1.7 CLI Error Messages

You may encounter some error messages while configuring Fiberroad's Ethenet switch. Refer the following table for an overview of error messages and solutions.

Error Message	Meaning	Solution
% Ambiguous command	The characters you enter	Re-enter the command

	insufficient for ed are the switch to recognize the command	with a space between the command and the question mark (?) . The possible keywords with the command will appear.
% Incomplete command	The keywords or values you enter are incomplete.	Re-enter the command with a space between the command and the question mark (?) . The possible keywords with the command will appear.
% Invalid input detected at ‘^’ marker.	The command you entered is incorrect. The point of invalid input will be indicated by a caret (^).	Enter a question mark (?) to display all the available commands in this command mode. The possible keywords with the command will appear.

1.8 Command History

Use the Up arrow and Down arrow keys to show cycle through the history of previously entered commands. Pressing the Up arrow will display the previously entered command. Pressing the Down arrow will display the next command in the history.

2
Commands

2.1. AAA

2.1.1. AAA Authentication

Syntax

aaa authentication (**login** | **enable**) (**default** | *LISTNAME*) *METHODLIST* [*METHODLIST*] [*METHODLIST*] [*METHODLIST*]
no aaa authentication (**login** | **enable**) *LISTNAME*

Parameter

login	Add/Edit login authentication list
enable	Add/Edit enable authentication list
default	Edit default authentication list
LISTNAME	Specify the list name for authentication type
METHODLIST	Specify the authenticate method, including none, local, enable, tacacs+, radius.

Default

Default authentication list name for type login is "default" and default method is "local".
Default authentication list name for type enable is "default" and default method is "enable"

Mode

Global Configuration

Usage

Login authentication is used when user try to login into the switch. Such as CLI login dialog and WEBUI login web page.
Enable authentication is used only on CLI for user trying to switch from User EXEC mode to Privileged EXEC mode.

Both of them support following authenticate methods.
Local: Use local user account database to authenticate. (This method is not supported for enable authentication)
Enable: Use local enable password database to authenticate.
Tacacs+: Use remote Tacas+ server to authenticate.
Radius: Use remote Radius server to authenticate.
None: Do nothing and just make user to be authenticated.

Usage

Each list allows you to combine these methods with different orders. For example, we want to authenticate login user with remote Tacacs+ server, but server may be crashed. Therefore, we need a backup plan, such as another Radius server. So we can configure the list with Tacacs+ server as first authentication method and Radius server as second one.

Use no form to delete the existing list. However, "default" list is not allowed to remove.

Example

This example shows how to add a login authentication list to authenticate with order tacacs+, radius, local.

Switch(config)# **aaa authentication login test1 tacacs+ radius local**

This example shows how to show existing login authentication lists

Switch# **show aaa authentication login lists**

```
Login List Name  | Authentication Method List
-----------------+--------------------------
default    | local
test1      | tacacs+      radius    local
```

This example shows how to add an enable authentication list to authenticate with order tacacs+, radius, enable.

Switch(config)# **aaa authentication enable test1 tacacs+ radius enable**

This example shows how to show existing enable authentication lists

Switch# **show aaa authentication login lists**

```
Enable List Name | Authentication Method List
-----------------+--------------------------
default    | enable
test2      | tacacs+ radius enable
```

2.1.2 login authentication

Syntax

login authentication *LISTNAME*
no login authentication

Parameter

LISTNAME Specify the login authentication list name to use.

Default

Default login authentication list for each line is "default".

Mode

Line Configuration

Usage

Different access methods are allowed to bind different login authentication lists. Use “login authentication” command to bind the list to specific line (console, telnet, ssh).
Use no form to bind the “default” list back.

Example

This example shows how to create a new login authentication list and bind to telnet line.

Switch(config)# **aaa authentication login test1**

tacacs+ radius local
Switch(config)# **line telnet**
Switch(config-line)# **login authentication test1**

This example shows how to show line binding lists.
Switch# **show line lists**

```
Line Type   |     AAA Type      |      List Name
-------------+-----------------+-----------------
console      |     login       | default
              |     enable     | default
telnet       |     login       | test1
              |     enable     | default
ssh          |     login       | default
              |     enable     | default http
               |    login       | default
https          |    login       | default
```

2.1.3 ip http login authentication

Syntax

ip (**http** | **https**) **login authentication** *LISTNAME*
no ip (**http** | **https**) **login authentication**

http	Bind login authentication list to user access WEBUI with http protocol
https	Bind login authentication list to user access WEBUI with https protocol
LISTNAME	Specify the login authentication list name to use.

Default

Default login authentication list for each line is “default”.

Mode

Global Configuration

Usage Different access methods are allowed to bind different login authentication lists. Use "**ip** (**http** | **https**) **login authentication**" command to bind the list to WEBUI access from http or https.

Use no form to bind the "default" list back.

Example This example shows how to create two new login authentication lists and bind to http and https.

```
Switch(config)# aaa authentication login test1 tacacs+ radius local
Switch(config)# aaa authentication login test2 radius local
Switch(config)# ip http login authentication test1
Switch(config)# ip https login authentication test2
```

This example shows how to show line binding lists.

```
Switch# show line lists
Line Type   |    AAA Type     |    List Name
-------------+-----------------+-----------------
console     |    login        | default
            |    enable       | default
telnet      |    login        | default
            |    enable       | default
ssh         |    login        | default
            |    enable       | default
http        |    login        | test1
https       |    login        | test2
```

2.1.4 enable authentication

Syntax **enable authentication** LISTNAME
no enable authentication

Parameter LISTNAME Specify the enable authentication list name to use.

Mode Line Configuration

Usage Different access methods are allowed to bind different enable authentication lists. Use "**enable authentication**" command to bind the list to specific line (console, telnet, ssh).

Use no form to bind the "default" list back.

Example

This example shows how to create a new enable authentication list and bind to telnet line.

Switch(config)# **aaa authentication enable test1 tacacs+ radius enable**

Switch(config)# **line telnet**

Switch(config-line)# **enable authentication test1**

This example shows how to show line binding lists.

Switch# **show line lists**

```
Line Type   |   AAA Type    |    List Name
console     |   login       | default
            |   enable      | default
telnet      |   login       | default
            |   enable      | test1
ssh         |   login       | default
            |   enable      | default
http        |   login       | default
https       |   login       | default
```

2.1.5 show aaa authentication

Syntax show aaa authentication (login | enable) lists

Parameter

login Show login authentication list

enable Show enable authentication list

Default No default value for this command

Mode Privileged EXEC

Usage Use "**show aaa authentication**" command to show login authentication or enable authentication method lists.

Example

This example shows how to show existing login authentication lists

Switch# **show aaa authentication login lists**

```
Login List Name   | Authentication Method List
------------------+-------------------------------
        default   | local
        test1     | tacacs+    radius   local
```

This example shows how to show existing enable authentication lists

Switch# **show aaa authentication login lists**

```
Enable List Name | Authentication Method List
------------------+-------------------------------
        default   | enable
        test2     | tacacs+    radius   enable
```

2.1.6 show line lists

Syntax show line lists

Parameter

Default No default value for this command

Mode Privileged EXEC

Usage Use “**show line lists**” command to show all lines’ binding list of all authentication, authorization, and accounting function.

Example This example shows how to show line binding lists.

```
Switch# show line lists
Line Type    |    AAA Type      |     List Name
------------------+------------------------+-----------------
Console       |    login            | default
              |    enable           | default
              |    exec| default
              |    commands     | default
              | accounting-exec | default
telnet        |    login            | default
              |    enable           | default
              |    exec             | default
              |    commands     | default
              | accounting-exec | default
ssh           |    login            | default
              |    enable           | default
              |    exec             | default
              |    commands     | default
              | accounting-exec | default
http          |    login            | default
https         |    login            | default
```

2.1.7 tacacs default-config

Syntax tacacs default-config [key TACACSKEY] [timeout <1-30>]

Parameter

key TACACSKEY Specify default tacacs+ server key string

timeout <1-30> Specify default tacacs+ server timeout value

Default Default tacacs+ key is “”.

Default tacacs+ timeout is 5 seconds.

Mode Global Configuration

Usage Use “**tacacs default-config**” command to modify default values of tacacs+ server. These default values will be used when user try to create a new tacacs+ server and not assigned these values.

Example This example shows how modify default tacacs+ configuration

```
Switch(config)# tacacs default-config timeout 20
Switch(config)# tacacs default-config key tackey
```

This example shows how to show default tacacs+ configurations.

```
Switch# show tacacs default-config
Timeout | Key
------------+---------
        10| tackey
```

This example shows how to create a new tacacs+ server with above default config and show results.

```
Switch(config)# tacacs host 192.168.1.111
Switch# show tacacs
Prio | Timeout | IP Address    |    Port | Key
------+--------------+--------------------+-----------+-------
1     |  10       |192.168.1.111 |   49    | tackey
```

2.1.8 tacacs host

Syntax tacacs host HOSTNAME [port <0-65535>] [key TACPLUSKEY] [priority <0-65535>] [timeout <1-30>] no tacacs [host HOSTNAME]

Parameter

host HOSTNAME	Specify tacacs+ server host name, both IP address and domain name are available.
port <0-65535>	Specify tacacs+ server udp port
key TACPLUSKEY	Specify tacacs+ server key string
priority <0-65535>	Specify tacacs+ server priority
timeout <1-30>	Specify tacacs+ server timeout value

Default Default tacacs+ key is “”.
Default tacacs+ timeout is 5 seconds.

Mode Global Configuration

Usage Use “tacacs host” command to add or edit tacacs+ server for authentication, authorization or accounting.

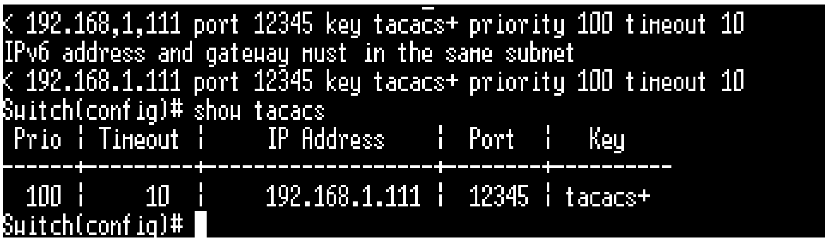
Use no form to delete one or all tacacs+ servers from database.

Example This example shows how to create a new tacacs+ server

Switch(config)# **tacacs host 192.168.1.111 port 12345 key tacacs+ priority 100 timeout 10**

This example shows how to show existing tacacs+ server.

Switch# **show tacacs**



```
< 192.168,1,111 port 12345 key tacacs+ priority 100 timeout 10
IPv6 address and gateway must in the same subnet
< 192.168.1.111 port 12345 key tacacs+ priority 100 timeout 10
Switch(config)# show tacacs
 Prio | Timeout |      IP Address      |  Port  |   Key
------+---------+----------------------+--------+---------
  100 |     10  |     192.168.1.111 |  12345 | tacacs+
Switch(config)# 
```

2.1.9 show tacacs default-config

Syntax show tacacs default-config

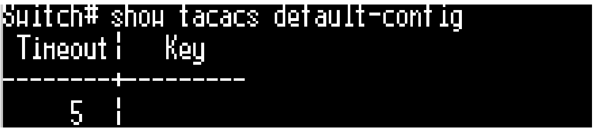
Parameter

Default No default value for this command

Usage Use "**show tacacs default-config**" command to show tacacs+ default configurations**.**

Example This example shows how to show default tacacs+ configurations.

Switch# **show tacacs default-config**



```
Switch# show tacacs default-config
 Timeout|    Key
--------+---------
      5 |
```

2.1.10 show tacacs

Syntax show tacacs

Parameter

Default No default value for this command

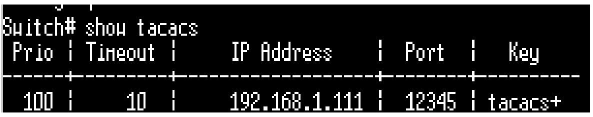
Mode Privileged EXEC

Usage Use "**show tacacs**" command to show existing tacacs+ servers.

Example

This example shows how to show existing tacacs+ server.

Switch# **show tacacs**



```
Switch# show tacacs
 Prio | Timeout |     IP Address     |  Port  |   Key
------+---------+--------------------+--------+---------
  100 |      10 |      192.168.1.111 |  12345 | tacacs+
```

2.1.11 show default-config

Syntax

radius default-config [key RADIUSKEY] [retransmit <1-10>] [timeout <1-30>]

Parameter

key RADIUSKEY Specify default radius server key string

retransmit <1-10> Specify default radius server retransmit value

timeout <1-30> Specify default radius server timeout value

Default

Default radius key is “”.

Default radius retransmit is 3 times.

Default radius timeout is 3 second

Mode

Global Configuration

Usage

Use “radius default-config” command to modify default values of radius server. These default values will be used when user try to create a new radius server and not assigned these values.

Example

This example shows how modify default radius configuration

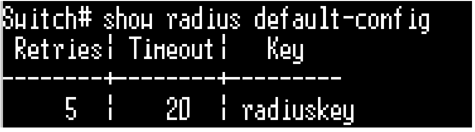
Switch(config)# **radius default-config timeout 20**

Switch(config)# **radius default-config key radiuskey**

Switch(config)# **radius default-config retransmit 5**

This example shows how to show default radius configurations.

Switch# show radius default-config

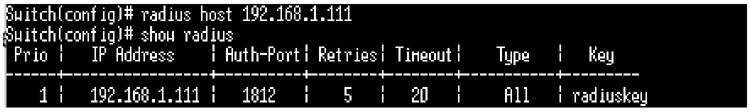


```
Switch# show radius default-config
 Retries| Timeout|    Key
--------+--------+---------
      5 |     20 | radiuskey
```

This example shows how to create a new radius server with above default config and show results.

Switch(config)# **radius host 192.168.1.111**

Switch# **show radius**



```
Switch(config)# radius host 192.168.1.111
Switch(config)# show radius
 Prio |    IP Address    | Auth-Port| Retries| Timeout|    Type    |   Key
------+------------------+----------+--------+--------+------------+---------
    1 |    192.168.1.111 |    1812  |    5   |   20   |     All    | radiuskey
```

2.1.12 radius host

Syntax **radius host** HOSTNAME [**auth-port** <0-65535>] [key RADIUSKEY] [priority <0-65535>] [**retransmit** <1-10>] [**timeout** <1-30>] [**type** (login|802.1x|all)] **no radius** [**host** HOSTNAME]

Parameter

host HOSTNAME	Specify radius server host name, both IP address and domain name are available.
auth-port <0-65535>	Specify radius server udp port
key RADIUSKEY	Specify radius server key string
Priority <0-65535>	Specify radius server priority
retransmit <1-10>	Specify radius server retransmit times
timeout <1-30>	Specify radius server timeout value
type login 802.1X all	Usage type of this server Use for login Use for 802.1X authentication Use for both login and 802.1X authentication

Default Default radius key is “”.
Default radius timeout is 3 seconds.

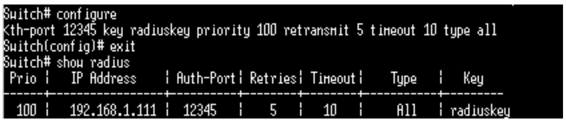
Mode Global Configuration

Usage Use “radius host” command to add or edit an existing radius server.

Use no form to delete one or all radius servers from database.

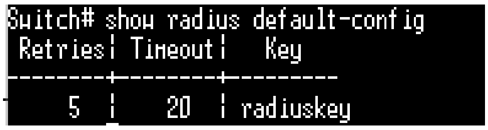
Example This example shows how to create a new radius server
Switch(config)# **radius host 192.168.1.111 auth-port 12345 key radiuskey priority 100 retransmit 5 timeout 10 type all**

This example shows how to show existing radius server.
Switch# show radius



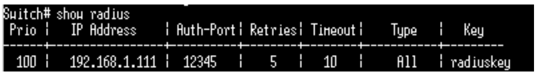
```
Switch# configure
<th-port 12345 key radiuskey priority 100 retransmit 5 timeout 10 type all
Switch(config)# exit
Switch# show radius
 Prio ¦   IP Address    ¦ Auth-Port¦ Retries¦ Timeout¦    Type    ¦   Key
------+-----------------+----------+--------+--------+------------+---------
  100 ¦   192.168.1.111 ¦  12345   ¦    5   ¦   10   ¦     All    ¦ radiuskey
```

2.1.13 show radius default-config

Syntax	show radius default-config
Parameter	
Default	No default value for this command
Usage	Use “**show radius default-config**” command to show radius default configurations.
Example	This example shows how to show default radius configurations. Switch# **show radius default-config** 

```
Switch# show radius default-config
 Retries| Timeout|    Key
--------+--------+--------
    5   |    20  | radiuskey
```

2.1.14 show radius

Syntax	**show radius**
Parameter	
Default	No default value for this command
Mode	Privileged EXEC
Usage	Use “show radius” command to show existing radius servers.
Example	This example shows how to show existing radius server. Switch# **show radius** 

```
Switch# show radius
 Prio |    IP Address     | Auth-Port| Retries| Timeout|    Type    |   Key
------+-------------------+----------+--------+--------+------------+---------
  100 |    192.168.1.111  |  12345   |    5   |   10   |    All     | radiuskey
```

2.2 ACL

2.2.1 mac acl

Syntax **mac acl NAME no mac acl NAME**

Parameter NAME Specify the name of MAC ACL

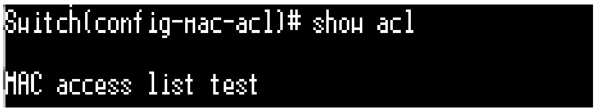
Default No default value for this command

Mode Global Configuration

Usage Use the **mac acl** command to create a MAC access list and to enter mac-acl configuration mode. The name of ACL must be unique that can not have same name with other ACL or QoS policy. Once an ACL is created, an implicit “deny any” ACE created at the end of the ACL. That is, if there are no matches, the packets are denied. Use the no form of this command to delete.

Example The example shows how to create a mac acl. You can verify settings by the following show acl command

Switch334455(config)# **mac acl test**
Switch334455(mac-al)# **show acl**



```
Switch(config-mac-acl)# show acl

MAC access list test
```

2.2.2 permit (MAC)

Syntax

[sequence <1-2147483647>] permit (A:B:C:D:E:F/A:B:C:D:E:F|any) (A:B:C:D:E:F/A:B:C:D:E:F|any) [vlan <1-4094>] [cos <0-7> <0-7>] [ethtype <0x0600-0xFFFF>] no sequence <1-2147483647>

Parameter

<1-2147483647>	(Optional) Specify sequence index of ACE, the sequence index represent the priority of an ACE in ACL.
(A:B:C:D:E:F/A:B:C:D:E:F|any)	Specify the source MAC address and mask of packet or any MAC address.
(A:B:C:D:E:F/A:B:C:D:E:F|any)	Specify the destination MAC address and mask of packet or any MAC address
[vlan <1-4094>]	(Optional) Specify the vlan ID of packet.
[cos <0-7> <0-7>]	(Optional) Specify the Class of Service value and mask of packet.
[ethtype <0x0600-0xFFFF>]	(Optional) Specify Ethernet protocol number of packet

Default

No default value for this command

Mode

MAC ACL Configuration

Usage

Use the permit command to add permit conditions for a mac ACE that bypass those packets hit the ACE. The “**sequence**” also represents hit priority when ACL bind to an interface. An ACE not specifies “sequence” index would assign a sequence index which is the largest existed index plus 20. If packet content can match more than one ACE, the lowest sequence ACE is hit. An ACE can not be added if has the same conditions as existed ACE.

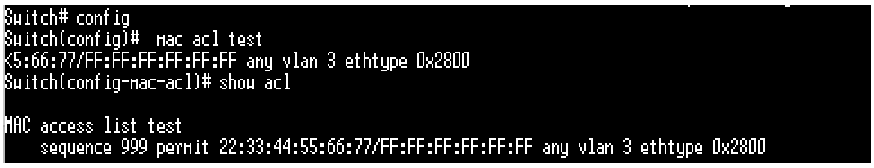
Example

The example shows how to add an ACE that permit packets with source MAC address 22:33:44:55:66:77 、 VLAN 3 and Ethernet type 1999. You can verify settings by the following **show acl** command

```
Switch3(config)# mac acl test
Switch(mac-al)# sequence 999 permit
```

22:33:44:55:66:77/FF:FF:FF:FF:FF:FF any vlan 3 ethtype 0x2800

Switch(mac-al)# **show acl**



```
Switch# config
Switch(config)#  mac acl test
<5:66:77/FF:FF:FF:FF:FF:FF any vlan 3 ethtype 0x2800
Switch(config-mac-acl)# show acl

MAC access list test
    sequence 999 permit 22:33:44:55:66:77/FF:FF:FF:FF:FF:FF any vlan 3 ethtype 0x2800
```

2.2.3 deny(MAC)

Syntax

[sequence <1-2147483647>] deny (A:B:C:D:E:F/A:B:C:D:E:F|any) (A:B:C:D:E:F/A:B:C:D:E:F|any) [vlan <1-4094>] [cos <0-7> <0-7>][ethtype <0x0600-0xFFFF>][shutdown] no sequence <1-2147483647>

Parameter

<1-2147483647>	(Optional) Specify sequence index of ACE, the sequence index represent the priority of an ACE in ACL.
(A:B:C:D:E:F/A:B:C:D:E:F|any)	Specify the source MAC address and mask of packet or any MAC address.
(A:B:C:D:E:F/A:B:C:D:E:F|any)	Specify the destination MAC address and mask of packet or any MAC address.
[vlan <1-4094>]	(Optional) Specify the vlan ID of packet.
[cos <0-7> <0-7>]	(Optional) Specify the Class of Service value and mask of packet.
[ethtype <0x0600-0xFFFF>]	(Optional) Specify Ethernet protocol number of packet
[shutdown]	(Optional) Shutdown interface while ACE hit

Default

No default value for this command

Mode

MAC ACL Configuration

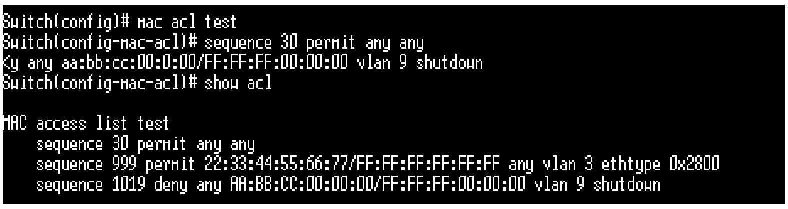
Usage

Use the deny command to add deny conditions for a mac ACE that drop those packets hit the ACE. The “sequence” also represents hit priority when ACL bind to an interface. An ACE not specifies "sequence" index would assign a sequence index which is the largest existed index plus 20. If packet content can match more than one ACE, the lowest sequence ACE is hit. An ACE cannot be added if has the same conditions as existed ACE. Use "shutdown" to shutdown interface while ACE hit.

Example

The example shows how to add an ACE that denies packets with destination MAC address aa:bb:cc:xx:xx:xx and VLAN 9. You can verify settings by the following **show acl** command

Switch(config)# **mac acl test**
Switch(mac-al)# **sequence 30 permit any any**
Switch(mac-al)# **deny any aa:bb:cc:00:0:00/FF:FF:FF:00:00:00 vlan 9 shutdown**
Switch(mac-al)# **show acl**



```
Switch(config)# mac acl test
Switch(config-mac-acl)# sequence 30 permit any any
ky any aa:bb:cc:00:0:00/FF:FF:FF:00:00:00 vlan 9 shutdown
Switch(config-mac-acl)# show acl

MAC access list test
    sequence 30 permit any any
    sequence 999 permit 22:33:44:55:66:77/FF:FF:FF:FF:FF:FF any vlan 3 ethtype 0x2800
    sequence 1019 deny any AA:BB:CC:00:00:00/FF:FF:FF:00:00:00 vlan 9 shutdown
```

2.2.4 ip acl

Syntax

ip acl NAME no ip acl NAME

Parameter

NAME Specify the name of IPv4 ACL

Default

No default value for this command

Mode

Global Configuration

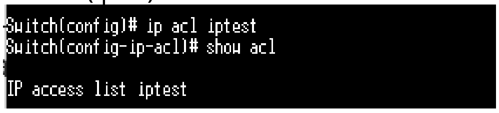
Usage

Use the **ip acl** command to create an IPv4 access list and to enter ip-acl configuration mode. The name of ACL must be unique that can not have same name with other ACL or QoS policy. Once an ACL is created, an implicit "deny any" ACE created at the end of the ACL. That is, if there are no matches, the packets are denied. Use the no form of this command to delete.

Example

The example shows how to create an IP ACL. You can verify settings by the following show acl command

Switch(config)#**ip acl iptest**
Switch(ip-al)# **show acl**



```
Switch(config)# ip acl iptest
Switch(config-ip-acl)# show acl

IP access list iptest
```

2.2.5 permit(IP)

Syntax

[sequence <1-2147483647>] permit (<0-255>|ipinip|egp|igp|hmp|rdp|ipv6|ipv6:rout|ipv6:frag|rsvp|ipv6:icmp|ospf|pim|l2tp|ip) (A.B.C.D/A.B.C.D|any) (A.B.C.D/A.B.C.D|any) [(dscp|precedence) VALUE]]

[sequence <1-2147483647>] permit icmp (A.B.C.D/A.B.C.D|any) (A.B.C.D/A.B.C.D|any) (<0-255>|echo-reply|destination-unreachable|source-quench|echo-request|router-advertisement|router-solicitation|time-exceeded|timestamp| timestamp-reply|traceroute|any) (<0-255>|any) [(dscp|precedence) VALUE]

[sequence <1-2147483647>] permit tcp (A.B.C.D/A.B.C.D|any) (<0-65535>|echo|discard|daytime|ftp-data|ftp|telnet|smtp|time|hostname|whois|tacacs-ds|domain|www|pop2|pop3|syslog|talk|klogin|kshell|sunrpc|drip|PORT_RANGE|any) (A.B.C.D/A.B.C.D|any) (<0-65535>|echo|discard|daytime|ftp-data|ftp|telnet|smtp|time|hostname|whois| tacacs-ds|domain|www|pop2|pop3|syslog|talk|klogin|kshell|sunrpc|dri p|PORT_RANGE|any) [match-all TCP_FLAG] [(dscp|precedence) VALUE]

[sequence <1-2147483647>] permit udp (A.B.C.D/A.B.C.D|any) (<0-65535>|echo|discard| time|nameserver|tacacs-ds|domain|bootps|bootpc|tftp|sunrpc|ntp|netbios-ns|snmp|snmptrap|who|syslog|talk|rip|PORT_RANGE|any) (A.B.C.D/A.B.C.D|any) (<0-65535>|echo|discard|time|nameserver|tacacs-ds|domain|bootps|bootpc|tftp|sunrpc|ntp|netbios-ns|snmp|snmptrap|who|syslog|PORT_RANGE|any) [(dscp|precedence) VALUE]

no sequence <1-2147483647>

Parameter	**<1-2147483647>**	(Optional) Specify sequence index of ACE, the sequence index represent the

	priority of an ACE in ACL.
(A.B.C.D/A.B.C.D|any)	Specify the source IPv4 address and mask of packet or any IPv4 address.
(A.B.C.D/A.B.C.D|any)	Specify the destination IPv4 address and mask of packet or any IPv4 address.
[dscp VALUE]	(Optional) Specify the DSCP of packet.
[precedence VLAUE]	(Optional) Specify the IP precedence of packet.
icmp-type	Specify ICMP message type for filtering ICMP packet. Enter a type name of list or a number of ICMP message type.
icmp-code	Specify ICMP message code for filtering ICMP packet.
l4-source-port	Specify TCP/UDP source port of for filtering TCP/UDP packet. Enter a port name of list or a number of TCP/UDP port.
l4-destination-port	Specify TCP/UDP destination port of for filtering TCP/UDP packet. Enter a port name of list or a number of TCP/UDP port.
match-all	Specify tcp flag for TCP packet. If a flag should be set it is prefixed by\"+\".If a flag should be unset it is prefixed by \"-\". Available optionsare +urg, +ack, +psh, +rst, +syn, +fin, -urg, -ack, -psh, -rst, -syn and -fin.To define more than 1 flag - enter additional flags one after another without a space (example +syn-ack)

Default No default value for this command

Mode IP ACL Configuration

Usage

Use the permit command to add permit conditions for an IP ACE that bypasses those packets hit the ACE. The “**sequence**” also represents hit priority when ACL bind to an interface. An ACE not specifies “**sequence**” index would assign a sequence index which is the largest existed index plus 20. If packet content can match more than one ACE, the lowest sequence ACE is hit. An ACE can not be added if has the same conditions as existed ACE.

Example

The example shows how to add a set of ACEs. You can verify settings by the following **show acl** command.

This command shows how to permit a source IP address subnet.

```
Switch(ip-al)# permit ip 192.168.1.0/255.255.255.0
```

This command shows how to permit ICMP echo-request packet with any IP address.

```
Switch(ip-al)# permit icmp any any echo-request any
```

This command shows how to permit any IP address HTTP packets with DSCP 5.

```
Switch (ip-al)# permit tcp any any any www dscp 5
```

This command shows how to permit any source IP address SNMP packet connect to destination IP address 192.168.1.1.

```
Switch (ip-al)# permit udp any any 192.168.1.1/255.255.255.255
snmp
```

```
Switch(ip-al)# show acl

IP access list iptest
  sequence 1 permit ip 192.168.1.0/255.255.255.0 any sequence 21
  permit icmp any any echo-request any sequence 41 permit tcp
  any any any www dscp 5
  sequence 61 permit udp any any 192.168.1.1/255.255.255.255
  snmp
```

2.2.6 deny(IP)

Syntax

```
[sequence<1-2147483647>]deny(<0-
255>|ipinip|egp|igp|hmp|rdp|ipv6|
ipv6:rout|ipv6:frag|rsvp|ipv6:icmp|ospf|pim|l2tp|ip)
(A.B.C.D/A.B.C.D|any) (A.B.C.D/A.B.C.D|any)
[(dscp|precedence) VALUE]] [shutdown]

[sequence <1-2147483647>] deny icmp (A.B.C.D/A.B.C.D|any)
(A.B.C.D/A.B.C.D|any) (<0-
255>|echo-reply|destination-unreachable|
source-quench|echo-request|router-advertisement|router-
solicitation|
time-exceeded|timestamp| timestamp-reply|traceroute|any) (<0-
255>|any) [(dscp|precedence) VALUE] [shutdown]

[sequence <1-2147483647>] deny tcp (A.B.C.D/A.B.C.D|any) (<0-
65535>|echo|
discard|daytime|ftp-
data|ftp|telnet|smtp|time|hostname|whois|tacacs-ds|
domain|www|pop2|pop3|syslog|talk|klogin|kshell|sunrpc|drip
| PORT_RANGE|any)
(A.B.C.D/A.B.C.D|any) (<0-65535>|echo|discard|daytime|ftp-
data|ftp|telnet|
smtp|time|hostname|whois|tacacs-
ds|domain|www|pop2|pop3|syslog|talk|
klogin|kshell|sunrpc|drip|PORT_RANGE|any)
[match-all TCP_FLAG] [(dscp|precedence) VALUE] [shutdown]

[sequence <1-2147483647>] deny udp (A.B.C.D/A.B.C.D|any) (<0-
65535>|echo|discard|time|nameserver|tacacs-
ds|domain|bootps|
bootpc|tftp|sunrpc|ntp|netbios-
ns|snmp|snmptrap|who|syslog|talk|rip|PORT_RANGE|any)
(A.B.C.D/A.B.C.D|any) (<0- 65535>|echo|
discard|time|nameserver|tacacs-
ds|domain|bootps|bootpc|tftp|sunrpc|ntp|netbios-
ns|snmp|snmptrap|who|syslog|PORT_RANGE|any)
[(dscp|precedence) VALUE] [shutdown]

no sequence <1-2147483647>
```

Parameter	**<1-2147483647>**	(Optional) Specify sequence index of ACE, the sequence index represent the priority of an ACE in ACL.

(A.B.C.D/A.B.C.D|any)	Specify the source IPv4 address and mask of packet or any IPv4 address.
(A.B.C.D/A.B.C.D|any)	Specify the destination IPv4 address
[dscp VALUE]	(Optional) Specify the DSCP of packet.
[precedence VLAUE]	(Optional) Specify the IP precedence of packet.
icmp-type	Specify ICMP message type for filtering ICMP packet. Enter a type name of list or a number of ICMP message type.
icmp-code	Specify ICMP message code for filtering ICMP packet.
l4-source-port	Specify TCP/UDP source port of for filtering TCP/UDP packet. Enter a port name of list or a number of TCP/UDP port.
l4-destination-port	Specify TCP/UDP destination port of for filtering TCP/UDP packet. Enter a port name of list or a number of TCP/UDP port.
match-all	Specify tcp flag for TCP packet. If a flag should be set it is prefixed by \"+\".If a flag should be unset it is prefixed by \"-\". Available options are +urg, +ack, +psh, +rst, +syn, +fin,-urg, -ack, -psh, -rst, -syn and -fin.To define more than 1 flag - enter additional flags one after another without a space (example +syn-ack).
[shutdown]	(Optional) Shutdown interface while ACE hit

Default No default value for this command

Mode IP ACL Configuration

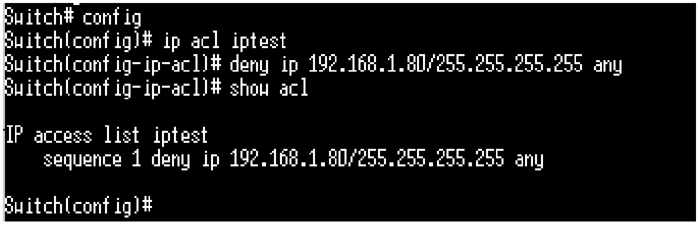
Usage Use the deny command to add deny conditions foran IP ACE that drop those packets hit the ACE. The “sequence” also represents hit priority when ACL bind to an interface. An ACE not specifies “sequence” index would assign a sequence index which is the largest existed index plus 20. If packet content can match more than one ACE, the lowest sequence ACE is hit. An ACE can not be added if has the same conditions as existed ACE. Use “shutdown” to shutdown interface while ACE hit.

Example

The example shows how to add an ACE that denies packets with source IP address 192.168.1.80. You can verify settings by the following show acl command

Switch(config)# ip acl iptest
Switch(ip-al)# deny ip 192.168.1.80/255.255.255.255 any

Switch(ip-al)# show acl



```
Switch# config
Switch(config)# ip acl iptest
Switch(config-ip-acl)# deny ip 192.168.1.80/255.255.255.255 any
Switch(config-ip-acl)# show acl

IP access list iptest
    sequence 1 deny ip 192.168.1.80/255.255.255.255 any

Switch(config)#
```

2.2.7 ipv6 acl

Syntax

ipv6 acl NAME
no ipv6 acl NAME

Parameter

NAME Specify the name of IPv6 ACL

Default

No default value for this command

Mode

Global Configuration

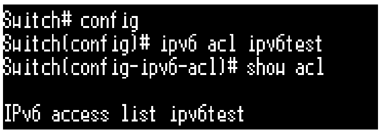
Usage

Use the **ipv6 acl** command to create an IPv6 access list and to enter ipv6-acl configuration mode. The name of ACL must be unique that can not have same name with other ACL or QoS policy. Once an ACL is created, an implicit "deny any" ACE created at the end of the ACL. That is, if there are no matches, the packets are denied. Use the no form of this command to delete.

Example

The example shows how to create an IPv6 ACL. You can verify settings by the following show acl command

Switch(config)#ipv6 acl ipv6test
Switch(ipv6-al)# show acl



```
Switch# config
Switch(config)# ipv6 acl ipv6test
Switch(config-ipv6-acl)# show acl

IPv6 access list ipv6test
```

2.2.8 permit(IPv6)

Syntax

[sequence <1-2147483647>] permit (<0-255>|ipv6) (X:X::X:X/<0-128>|any) (X:X::X:X/<0-128>|any) [(dscp|precedence) VALUE]

[sequence <1-2147483647>] permit icmp (X:X::X:X/<0- 128>|any) (X:X::X:X/<0-128>|any) (<0-255>|destination- unreachable|packet-too-big|
time-exceeded|parameter-problem|echo-request|echo-reply| mld-query|mld-report|mldv2-report|mld-done| router-solicitation|router-advertisement|nd-ns|nd-na|any) (<0-255>|any)[(dscp|precedence) VALUE]

[sequence <1-2147483647>] permit tcp (X:X::X:X/<0- 128>|any) (<0-65535>|echo|discard|daytime|ftp- data|ftp|telnet|smtp|
time|hostname|whois|tacacs-ds|domain|www|pop2|pop3|syslog|
talk|klogin|kshell|sunrpc|drip|PORT_RANGE|any) (X:X::X:X/<0-128>|any) (<0-65535>|echo|discard|daytime|ftp- data|ftp|
telnet|smtp|time|hostname|whois|tacacs-ds|domain|www|pop2|
pop3|syslog|talk|klogin|kshell|sunrpc|drip|PORT_RANGE|any) [match-all TCP_FLAG] [(dscp|precedence) VALUE]

[sequence <1-2147483647>] permit udp (X:X::X:X/<0- 128>|any) (<0-65535>|echo|discard|time|nameserver|tacacs-ds|domain|
bootps|bootpc|tftp|sunrpc|ntp|netbios-ns|snmp|snmptrap|who|syslog|
talk|rip|PORT_RANGE|any) (X:X::X:X/<0-128>|any) (<0-65535>|echo|discard|time|nameserver|tacacs-ds|domain|
bootps|bootpc|tftp|sunrpc|ntp|netbios-ns|
snmp|snmptrap|who|syslog|PORT_RANGE|any)
[(dscp|precedence) VALUE]

no sequence <1-2147483647>

Parameter		
	<1-2147483647>	(Optional) Specify sequence index of ACE, the sequence index represent the priority of an ACE in ACL.
	(X:X::X:X/<0-128>|any)	Specify the source IPv6 address and prefix of packet or any IPv6 address.
	(X:X::X:X/<0-128>|any)	Specify the destination IPv6 address and prefix of packet or any IPv6 address.

[dscp VALUE]	(Optional) Specify the DSCP of packet.
[precedence VLAUE]	(Optional) Specify the IP precedence of packet.
icmp-type	Specify ICMP message type for filtering ICMP packet. Enter a type name of list or a number of ICMP message type.
icmp-code	Specify ICMP message code for filtering ICMP packet.
l4-source-port	Specify TCP/UDP source port of for filtering TCP/UDP packet. Enter a port name of list or a number of TCP/UDP port.
l4-destination-port	Specify TCP/UDP destination port of for filtering TCP/UDP packet. Enter a port name of list or a number of TCP/UDP port.
Match-all	Specify tcp flag for TCP packet. If a flag should be set it is prefixed by \"+\".If a flag should be unset it is prefixed by \"-\". Available options are +urg, +ack, +psh, +rst, +syn, +fin, -urg, -ack, -psh, -rst, -syn and -fin.To define more than 1 flag - enter additional flags one after another without a space (example +syn-ack).

Default No default value for this command

Mode IPv6 ACL Configuration

Usage Use the permit command to add permit conditions for an IPv6 ACE that bypasses those packets hit the ACE. The “sequence” also represents hit priority when ACL bind to an interface. An ACE not specifies “**sequence**” index would assign a sequence index which is the largest existed index plus

20. If packet content can match more than one ACE, the lowest sequence ACE is hit. An ACE can not be added if has the same conditions as existed ACE.

Example The example shows how to add a set of ACEs. You can verify settings by the following **show acl** command.

This command shows how to permit a source IP address subnet.

Switch(ipv6-al)# **permit permit ipv6 fe80:1122:3344:5566::1/64 any**

```
Switch(ipv6-al)# show acl
IPv6 access list ipv6test
  sequence 1 permit ipv6 fe80:1122:3344:5566::1/64 any
```

2.2.9 deny(IPv6)

Syntax

[sequence <1-2147483647>] deny (<0-255>|ipv6) (X:X::X:X/<0-128>|any) (X:X::X:X/<0-128>|any) [(dscp|precedence) VALUE] [shutdown]

[sequence <1-2147483647>] deny icmp (X:X::X:X/<0-128>|any) (X:X::X:X/<0-128>|any) (<0-255>|destination- unreachable|packet-too-big|
time-exceeded|parameter-problem|echo-request|echo-reply|
mld-query|mld-report|mldv2-report|mld-done| router-solicitation|router-advertisement|nd-ns|nd-na|any) (<0-255>|any)[(dscp|precedence) VALUE] [shutdown]

[sequence <1-2147483647>] deny tcp (X:X::X:X/<0-128>|any) (<0-65535>|echo|discard|daytime|ftp-data|ftp|telnet|smtp|
time|hostname|whois|tacacs-ds|domain|www|pop2|pop3|syslog|
talk|klogin|kshell|sunrpc|drip|PORT_RANGE|any) (X:X::X:X/<0-128>|any) (<0-65535>|echo|discard|daytime|ftp- data|ftp|
telnet|smtp|time|hostname|whois|tacacs-ds|domain|www|pop2|
pop3|syslog|talk|klogin|kshell|sunrpc|drip|PORT_RANGE|any)
[match-all TCP_FLAG] [(dscp|precedence) VALUE] [shutdown]

[sequence <1-2147483647>] deny udp (X:X::X:X/<0-128>|any) (<0-65535>|echo|discard|time|nameserver|tacacs-ds|domain|
bootps|bootpc|tftp|sunrpc|ntp|netbios-ns|snmp|snmptrap|who|syslog|
talk|rip|PORT_RANGE|any) (X:X::X:X/<0-128>|any) (<0-65535>|echo|discard|time|nameserver|tacacs-ds|domain|
bootps|bootpc|tftp|sunrpc|ntp|netbios-ns|
snmp|snmptrap|who|syslog|PORT_RANGE|any)
[(dscp|precedence) VALUE] [shutdown]

no sequence <1-2147483647>

Parameter		
	<1-2147483647>	(Optional) Specify sequence index of ACE, the sequence index represent the priority of an ACE in ACL.
	(A.B.C.D/A.B.C.D| any)	Specify the source IPv4 address and mask of packet or any IPv4 address.
	(A.B.C.D/A.B.C.D| any)	Specify the destination IPv4 address and mask of packet or any IPv4
	[dscp VALUE]	(Optional) Specify the DSCP of packet.
	[precedenc VLAUE]	(Optional) Specify the IP precedence of packet.
	icmp-type	Specify ICMP message type for filtering ICMP packet. Enter a type name of list or a number of ICMP message type.
	icmp-code	Specify ICMP message code for filtering ICMP packet.
	l4-source-port	Specify TCP/UDP source port of for filtering TCP/UDP packet. Enter a port name of list or a number of TCP/UDP port.
	l4-destination-port	Specify TCP/UDP destination port of for filtering TCP/UDP packet. Enter a port name of list or a number of TCP/UDP port.
	match-all	Specify tcp flag for TCP packet. If a flag should be set it is prefixed by \"+\".If a flag should be unset it is prefixed by \"-\". Available options are +urg, +ack, +psh, +rst, +syn, +fin, -urg, -ack, -psh, -rst, -syn and -fin.To define more than 1 flag - enter additional flags one after another without a space (example +syn-ack).
	[shutdown]	(Optional) Shutdown interface while ACE hit

Default No default value for this command

Mode IP ACL Configuration

Usage Use the deny command to add deny conditions for an IPv6 ACE that drop those packets hit the ACE. The “sequence” also represents hit priority when ACL bind to an interface. An ACE not specifies “sequence” index would assign a sequence index which is the largest existed index plus 20. If packet content can match more than one ACE, the lowest sequence ACE is hit. An ACE can not be added if has the same conditions as existed ACE. Use “shutdown” to shutdown interface while ACE hit.

Example

The example shows how to add an ACE that denies packets with destination IP address fe80::abcd. You can verify settings by the following show acl command

Switch(config)# **ipv6 acl ipv6test**
Switch3(ip-al)# **deny**
i**pv6 any fe80::abcd/128 Switch334455(ip-al)**
Switch3(ip-al)# **show acl**

IPv6 access list ipv6test
sequence 1 deny ipv6 any fe80::abcd/128

2.2.10 bind acl

Syntax

(mac|ip|ipv6) acl NAME [no] (mac|ip|ipv6) acl NAME

Parameter

(mac|ip|ipv6)Specify a type of ACL to binding to interface
NAME Specify the name of ACL

Default

No default value for this command

Mode

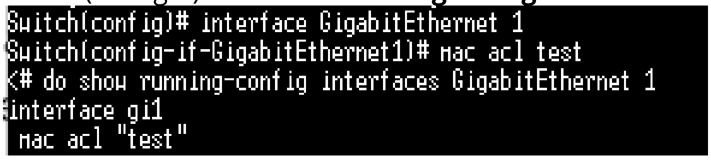
Interface Configuration

Usage

Use the **(mac|ip|ipv6) acl NAME** command to bind an ACL to interfaces. An interface can bind only one ACL or QoS policy. Use the no form of this command to return to unbind an ACL from interface.

Example

The example shows how to bind an existed ACL to interface.
switch(config)# **interface fa1**
switch(config-if)# **mac acl test**
switch(config-if)# **do show running-config interfaces fa1**



```
Switch(config)# interface GigabitEthernet 1
Switch(config-if-GigabitEthernet1)# mac acl test
<# do show running-config interfaces GigabitEthernet 1
interface gi1
 mac acl "test"
```

2.2.11 show acl

Syntax

show acl
show (mac|ip|ipv6) acl
show (mac|ip|ipv6) acl NAME

Parameter

(mac|ip|ipv6)Specify a type of ACL to show
NAME Specify the name of ACL

Default

No default value for this command

Mode

Global
Configuration
Context
Configuration

Usage

Use the show acl command to show created ACLs. You can specify mac、ip or ipv6 to show specific type ACL or specify unique name string to show ACL with the name

Example

The example shows how to show all IP ACL.

```
Switch(config)# show ip acl
```

IP access list iptest
sequence 1 deny ip 192.168.1.80/255.255.255.255 any

2.2.12 show acl utilization

Syntax

show acl utilization

Parameter

None

Default

No default value for this command

Mode

Global Configuration

Usage

Use the **show acl utilization** command to show the usage of PIE of ASIC. When an ACL bind to interface, it needs ASIC resource to help to filter packet. An ASIC has limited resource. This command help user to know the PIE usage of AISC.

Example

The example shows how to show utilization

```
Switch(config-if)# do show acl utilization
```

	Type: sys usage: 128 Type: mac ACL usage: 128 Type: IPv4 ACL usage: 128 Type: IPv6 ACL usage: 128

2.3 Administration

2.3.1 Configure

Syntax	**configure**
Parameter	None
Default	No default value for this command
Mode	Privileged EXEC
Usage	Use “**configure**” command to enter global configuration mode. In global configuration mode, the prompt will show as “**Switch(config)#**”.
Example	This example shows how to enter global configuration mode. Switch# **configure** Switch(config)#

2.3.2 clear arp

Syntax	**clear arp [A.B.C.D]**	
Parameter	A.B.C.D	Specify specific arp entry to clear.
Default	No default value for this command	
Mode	User EXEC Privileged EXEC	
Usage	Use “clear arp” command to clear all or specific one arp entry.	
Example	This example shows how to clear all arp entries. Switch(config)# clear arp	

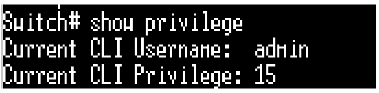
2.3.3 clear service

Syntax	**clear (telnet | ssh)**
Parameter	**telnet** Clear all telnet sessions. **ssh** Clear all ssh sessions.
Default	No default value for this command
Mode	Privileged EXEC
Usage	Use "**clear service**" command to kill all existing sessions for the select service.
Example	This example shows how to enable telnet service and show current telnet service status. Switch# clear telnet

2.3.4 enable

Syntax	**enable [<1-15>]** **disable [<1-14>]**
Parameter	<1-15> Specify privileged level to enable <1-14>Specify privileged level to disable
Default	Default privilege level is 15 if no privilege level is specified on enable command. Default privilege level is 1 if no privilege level is specified on disable command.
Mode	User EXEC
Usage	In User EXEC mode, user only allows to do a few actions. Most of commands are only available in privileged EXEC mode. Use "**enable**" command to enter the privileged mode to do more actions on switch. In privileged EXEC mode, use "exit" command is able to go back to user EXEC mode with original user privilege level. If you need to go back to user EXEC mode with different privilege level, use "**disable**" command to specify the privilege level you need.

	In privileged EXEC mode, the prompt will show "**Switch**#"

Example	This example shows how to enter privileged EXEC mode and show current privilege level.
	Switch> enable
	Switch# show privilege
	
	`Switch# show privilege`
	`Current CLI Username:  admin`
	`Current CLI Privilege: 15`
	This example show how to enter user EXEC mode with privilege 3.
	Switch# disable 3
	Switch> show privilege Current CLI Username:
	Current CLI Privilege: 3

2.3.5 end

Syntax	**end**
Parameter	None
Default	No default value for this command.
Mode	Privileged EXEC Global Configuration Interface Configuration Line Configuration …….
Usage	Use "end" command to return to privileged EXEC mode directly. Every mode except User EXEC mode has the "end" command.
Example	This example shows how to enter Interface Configuration mode and use end command to go back to privileged EXEC mode Switch# configure Switch(config)# interface fa1 Switch(config-if)# end Switch#

2.3.6 exit

Syntax	**exit**
Parameter	None
Default	No default value for this command.
Mode	User EXEC Privileged EXEC Global Configuration Interface Configuration Line Configuration …….
Usage	In User EXEC mode, "**exit**" command will close current CLI session. In other modes, **"exit"** command will go to the parent mode. And every mode has the "exit" command.
Example	This example shows how to enter privileged EXEC mode and use exit command to go back to user EXEC mode. Switch> **enable** Switch# **exit** Switch>

2.3.7 history

Syntax	**history** <1-256> **no history**
Parameter	<1-256> Specify maximum CLI history entry number.
Default	Default maximum history entry number is 128.
Mode	Line Configuration
Usage	Use "**history"** command to specify the maximum commands history number for CLI running on console, telnet or ssh service. Every command input by user will record in history buffer. If all history commands exceed configured history number, older ones will be deleted from buffer.

Use “**no history**” to disable the history feature. And use “**show history**” to show all history commands.

Example

This example shows how to change console history number to 100, telnet history number to 150 and ssh history number to 200.

Switch(config)# **line console**

Switch(config-line)# **history 100**

Switch(config-line)# **exit**

Switch(config)# **line telnet**

Switch(config-line)# **history 150**

Switch(config-line)# **exit**

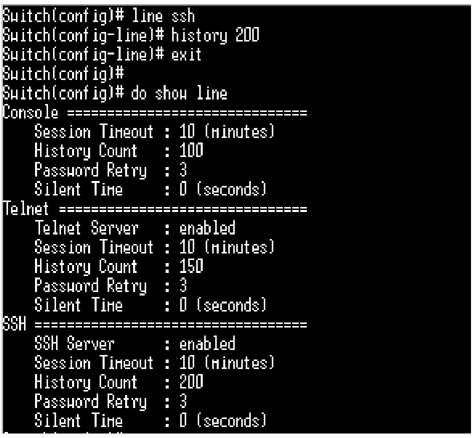
Switch(config)# **line ssh**

Switch(config-line)# **history 200**

Switch(config-line)# **exit**

This example shows how show line information.

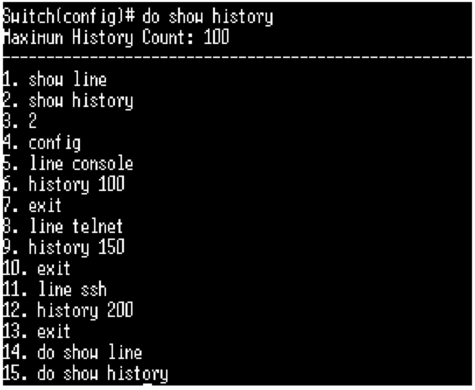
Switch# show line



```
Switch(config)# line ssh
Switch(config-line)# history 200
Switch(config-line)# exit
Switch(config)#
Switch(config)# do show line
Console ==============================
    Session Timeout : 10 (minutes)
    History Count   : 100
    Password Retry  : 3
    Silent Time     : 0 (seconds)
Telnet ===============================
    Telnet Server   : enabled
    Session Timeout : 10 (minutes)
    History Count   : 150
    Password Retry  : 3
    Silent Time     : 0 (seconds)
SSH ==================================
    SSH Server      : enabled
    Session Timeout : 10 (minutes)
    History Count   : 200
    Password Retry  : 3
    Silent Time     : 0 (seconds)
```

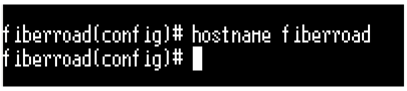
This example shows how show history commands.

Switch# **show history**



```
Switch(config)# do show history
Maximum History Count: 100
-------------------------------------------------------
1. show line
2. show history
3. 2
4. config
5. line console
6. history 100
7. exit
8. line telnet
9. history 150
10. exit
11. line ssh
12. history 200
13. exit
14. do show line
15. do show history
```

2.3.8 hostname

Syntax	**hostname** WORD
Parameter	WORD Specify the hostname of the switch.
Default	Default name string is “Switch”.
Mode	Global Configuration
Usage	Use “hostname” command to modify hostname of the switch. The system name is also used to be CLI prompt.
Example	This example shows how to modify contact information Switch(config)# hostname fiberroad fiberroad(config)#  fiberroad(config)# hostname fiberroad fiberroad(config)#

2.3.9 interface

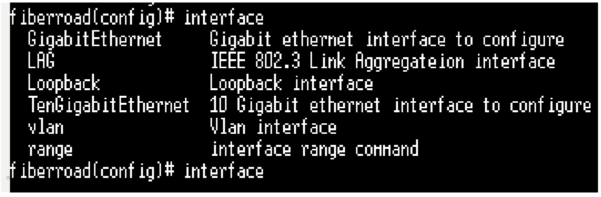
Syntax	**interface** IF_PORTS **interface range** IF_PORTS
Parameter	**IF_PORTS** Specify the port to select. This parameter allows partial port name and ignore case. For Example: fa1 FastEthernet3 Gigabit4 …… If port range is specified, the list format is also available. For Example: fa1,3,5 fa2,gi1-3 ……
Default	No default value for this command.
Mode	Global Configuration
Usage	Some configurations are port based. In order to configure these configurations, we need to enter Interface Configuration mode to configure them. Use “interface” command to enter the Interface Configuration mode and select the port to be configured.

In Interface Configuration mode, the prompt will show as "**Switch(config- if**)#"

Example This example shows how to enter Interface Configuration mode

Switch# configure

Switch(config)# interface ?



```
fiberroad(config)# interface
  GigabitEthernet     Gigabit ethernet interface to configure
  LAG                 IEEE 802.3 Link Aggregateion interface
  Loopback            Loopback interface
  TenGigabitEthernet  10 Gigabit ethernet interface to configure
  vlan                Vlan interface
  range               interface range command
fiberroad(config)# interface
```

2.3.10 ip address

Syntax **ip address** A.B.C.D **[mask** A.B.C.D**]**

Parameter

address A.B.C.D	Specify IPv4 address for switch
mask A.B.C.D	Specify net mask address for switch

Default Default IP address is 192.168.1.6 and default net mask is 255.255.255.0

Mode Global Configuration

Usage Use "**ip address**" command to modify administration ipv4 address. This address is very important. When we try to use telnet, ssh, http, https, snmp... to connect to the switch, we need to use this ip address to access it.

Example This example shows how to modify the ipv4 address of the switch.

Switch(config)# **ip address 192.168.1.200 mask 255.255.255.0**

This example shows how to show current ipv4 address of the switch.

Switch# **show ip**

IP Address: 192.168.1.200

Subnet Netmask: 255.255.255.0

Default Gateway: 192.168.1.254

2.3.11 ip default-gateway

Syntax	**ip default-gateway** A.B.C.D **no ip default-gateway**
Parameter	A.B.C.D Specify default gateway IPv4 address for switch
Default	Default IP address of default gateway is 192.168.1.254.
Mode	Global Configuration
Usage	Use "**ip default-gateway**" command to modify default gateway address. And use "**no ip default-gateway**" to restore default gateway address to factory default.
Example	This example shows how to modify the ipv4 address of the switch. Switch(config)# ip default-gateway 192.168.1.100 This example shows how to show current ipv4 default gateway of the switch. Switch# **show ip** IP Address: 192.168.1.1 Subnet Netmask: 255.255.255.0 Default Gateway: 192.168.1.100

2.3.12 ip dhcp

Syntax	**ip dhcp** **no ip dhcp**
Parameter	None
Default	Default DHCP client is disabled.
Mode	Global Configuration
Usage	Use "**ip dhcp**" command to enabled dhcp client to get IP address from remote DHCP server. Use "**no ip dhcp**" command to disabled dhcp client and use static ip address.
Example	This example shows how to enable dhcp client.

	Switch(config)# **ip dhcp** This example shows how to show current dhcp client state of the switch. Switch# **show ip dhcp** DHCP Status : enabled

2.3.13 ip dns

Syntax	**ip dns** A.B.C.D [A.B.C.D] **no ip dns** [A.B.C.D]
Parameter	A.B.C.D Specify the DNS server ip address.
Default	Default IP address of DNS server is 168.95.1.1 and 168.95.192.1.
Mode	Global Configuration
Usage	Use “ip dns” command to modify DNS server address. And use “no ip dns”to delete existing DNS server.
Example	This example shows how to modify the DNS server of the switch. Switch(config)# **ip dns 111.111.111.111 222.222.222.222** This example shows current DNS server of the switch. Switch# **show ip dns** DNS lookup is enabled DNS Server 1 : 111.111.111.111 DNS Server 2 : 222.222.222.222

2.3.13 ip dns lookup

Syntax	**ip dns lookup** **no ip dns lookup**
Parameter	None
Default	Default DNS lookup is enabled
Mode	Global Configuration

Usage

Use “ip dns lookup” command to enable the Domain Name to IP address service. And use “no ip dns” to disable the DNS service.

Example

This example enables the DNS service on the system.

```
Switch(config)# ip dns lookup
```

This example shows the DNS service status.

```
Switch# show ip dns
DNS Server 1 : 111.111.111.111
DNS Server 2 : 222.222.222.222
```

2.3.14 ipv6 autoconfig

Syntax

ipv6 autoconfig
no ipv6 autoconfig

Parameter

None

Default

Default IPv6 auto config is enabled.

Mode

Global Configuration

Usage

Use “ipv6 autoconfig” command to enabled IPv6 auto configuration feature. Use “no ipv6 autoconfig” command to disabled IPv6 auto configuration feature.

Example

This example shows how to disable IPv6 auto config.

```
Switch(config)# no ipv6 autoconfig
```

This example shows how to show current IPv6 auto config state.

```
Switch# show ipv6
IPv6 DHCP Configuration  : Disabled
IPv6 DHCP DUID           :
IPv6 Auto Configuration  : Disabled
IPv6 Link Local Address  : fe80::dcad:beff:feef:102/64
IPv6 static Address      : fe80::20e:2eff:fef1:4b3c/128
IPv6 static Gateway Address : ::
IPv6 in use Address       : fe80::dcad:beff:feef:102/64
IPv6 in use Gateway Address : ::
```

2.3.15 ipv6 address

Syntax

ipv6 address X:X::X:X **prefix** <0-128>

Parameter

address X:X::X:X Specify IPv6 address for switch
prefix <0-128> Specify IPv6 prefix length for switch

Default

No default ipv6 address on the switch.

Mode

Global Configuration

Usage

Use "**ipv6 address**" command to specify static IPv6 address.

Example

This example shows how to add static ipv6 address of the switch.

```
Switch(config)# ipv6 address fe80::20e:2eff:fef1:4b3c prefix 128
```

This example shows how to show current ipv6 address of the switch.

```
Switch# show ipv6
IPv6 DHCP Configuration : Disabled IPv6 DHCP DUID        :
IPv6 Auto Configuration   : Enabled
IPv6 Link Local Address   : fe80::dcad:beff:feef:102/64
IPv6 static Address       : fe80::20e:2eff:fef1:4b3c/128
IPv6 static Gateway Address : ::
IPv6 in use Address       : fe80::dcad:beff:feef:102/64
IPv6 in use Gateway Address : ::
```

2.3.16 ipv6 default-gateway

Syntax

ipv6 default-gateway X:X::X:X

Parameter

X:X::X:X Specify default gateway IPv6 address for switch

Default

No default ipv6 default gateway address on the switch.

Mode

Global Configuration

Usage

Use "ipv6 default-gateway" command to modify default gateway IPv6 address.

Example

This example shows how to modify the ipv6 default gateway address of the switch.

```
Switch(config)# ipv6 default-gateway fe80::dcad:beff:feef:103
```

```
Switch# show ipv6
IPv6 DHCP Configuration : Disabled IPv6 DHCP DUID       :
IPv6 Auto Configuration   : Enabled
IPv6 Link Local Address    : fe80::dcad:beff:feef:102/64
IPv6 static Address           : fe80::20e:2eff:fef1:4b3c/128
IPv6 static Gateway Address : ::
IPv6 in use Address   : fe80::dcad:beff:feef:102/64
IPv6 in use Gateway Address : ::
```

2.3.17 ipv6 dhcp

Syntax	**ipv6 dhcp** **no ipv6 dhcp**
Parameter	
Default	Default DHCPv6 client is disabled.
Mode	Global Configuration
Usage	Use "ipv6 dhcp" command to enabled dhcpv6 client to get IP address from remote DHCPv6 server. Use "no ipv6 dhcp" command to disabled dhcpv6 client and use static ipv6
Example	This example shows how to enable dhcp client. Switch(config)# **ipv6 dhcp** This example shows how to show current dhcpv6 client state of the switch. Switch# **show ipv6 dhcp** DHCPv6 Status : enabled

2.3.18 ip service

Syntax

ip (telnet | ssh | http | https)
no ip (telnet | ssh | http | https)

Parameter

telnet	Enable/Disable telnet service
ssh	Enable/Disable ssh service
http	Enable/Disable http service
https	Enable/Disable https service

Default

Default telnet service is disabled.
Default ssh service is disabled.
Default http service is enabled.
Default https service is disabled.

Mode

Global Configuration

Usage

Use “ip service” command to enable all kinds of ip services. Such as telnet, ssh, http and https.
Use no form to disable service.

Example

This example shows how to enable telnet service and show current telnet service status.

```
Switch(config)# ip telnet
Telnetd daemon enabled.
Switch(config)# exit
Switch# show line telnet
Telnet ==============================
Telnet Server   : enabled Session
Timeout : 10 (minutes) History Count : 128
Password Retry      : 3
Silent Time      : 0 (seconds)
```

This example shows how to enable https service and show current https service status.

```
Switch(config)# ip https

Switch(config)# exit
Switch# show ip https
HTTPS daemon : enabled
Session Timeout : 10 (minutes)
```

2.3.19 ip session-timeout

Syntax	**ip (http | https) session-timeout** <0-86400>
Parameter	http Specify session timeout for http service. https Specify session timeout for https service. <0-86400> Specify session timeout minutes. 0 means never timeout.
Default	Default session timeout for http and https is 10 minutes.
Mode	Global Configuration
Usage	Use "**ip session-timeout**" command to specify the session timeout value for http or https service. When user login into WEBUI and do not do any action after session timeout will be logged out.
Example	This example shows how to change http session timeout to 15min and https session timeout to 20min Switch(config)# **ip http session-timeout 15** Switch(config)# **ip https session-timeout 20** This example shows how to enable https service and show current https service status. Switch# **show ip http** HTTPS daemon : enabled Session Timeout : 15 (minutes) Switch# **show ip https** HTTPS daemon : disabled Session Timeout : 20 (minutes)

2.3.20 ip ssh

Syntax **ip ssh (v1|v2|all)**
no ip ssh (v1|v2|all)

Parameter v1 Generate/Delete version 1 key files
v2 Generate/Delete version 2 key files
all Generate/Delete version 1 and 2 key files

Default Version 2 key files will be generated by default

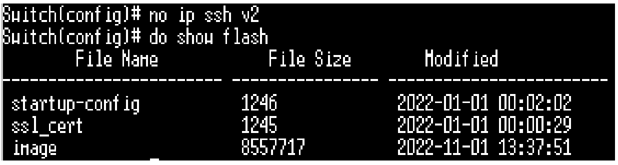
Mode Global Configuration

Usage Use “ip ssh” command to generate the key files for ssh connection.

Use no form to delete key files. SSH connection may not connect if no any v1 or v2 ssh key files exist.

Example This example shows how to delete and re-generate ssh version 2 key files.

Switch(config)# no ip ssh v2
Switch(config)# do show flash



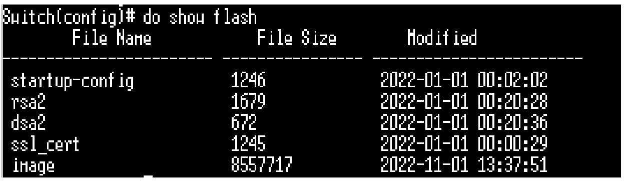
```
Switch(config)# no ip ssh v2
Switch(config)# do show flash
        File Name               File Size         Modified
------------------------ ---------------- ------------------------
 startup-config             1246             2022-01-01 00:02:02
 ssl_cert                   1245             2022-01-01 00:00:29
 image                      8557717          2022-11-01 13:37:51
```

Switch(config)# **ip ssh v2**

Generating a SSHv2 default RSA Key.
This may take a few minutes, depending on the key size.

Generating a SSHv2 default DSA Key.
This may take a few minutes, depending on the key size.

Switch(config)# **do show flash**



```
Switch(config)# do show flash
        File Name               File Size         Modified
------------------------ ---------------- ------------------------
 startup-config             1246             2022-01-01 00:02:02
 rsa2                       1679             2022-01-01 00:20:28
 dsa2                       672              2022-01-01 00:20:36
 ssl_cert                   1245             2022-01-01 00:00:29
 image                      8557717          2022-11-01 13:37:51
```

2.3.21 line

Syntax	**line (console | telnet | ssh)**
Parameter	console Select console line to configure. telnet Select telnet line to configure. ssh Select ssh line to configure.
Default	No default value for this command.
Mode	Global Configuration
Usage	Some configurations are line based. In order to configure these configurations, we need to enter Line Configuration mode to configure them. Use “line” command to enter the Line Configuration mode and select the line to be configured. In Line Configuration mode, the prompt will show as “**Switch(config-line)#**”
Example	This example shows how to enter Interface Configuration mode Switch# **configure** Switch(config)# **line console** Switch(config-line)#

2.3.22 reboot

Syntax	**reboot**
Parameter	
Default	No default value for this command.
Mode	Privileged EXEC
Usage	Use “**reboot**” command to make system hot restart.
Example	This example shows how to restart the system Switch# **reboot**

2.3.23 enable password

Syntax

enable [privilege <1-15>] (**password** UNENCRYPY PASSWOR|secrect UNENCRYPY-PASSWORD | secret encrypted ENCRYPT-PASSWORD) no enable [privilege <0-15>]

Parameter

privilege *<0-15>*	Specify the privilege level to configure. If no privilege level is specified, default is 15.
password UNENCRYPY-PASSWORD	Specify password string and make it not encrypted.
secret UNENCRYPY-PASSWORD	Specify password string and make it encrypted.
secret encrypted ENCRYPT-PASSWORD	Enter an encrypted password. Use this keyword to enter a password that is already encrypted (for instance, a password that you copied from another the configuration file of another device).

Default

Default enable password for all privilege levels are “”.

Mode

Global Configuration

Usage

Use “enable password” command to edit password for each privilege level for enable authentication. And use “no enable” command to restore enable password to default empty value.

The only way to show this configuration is using “show running-config” command.

Example

This example shows how to edit enable password for privilege level 15

```
Switch(config)# enable secret enblpasswd
```

2.3.24 exec-timeout

Syntax

exec-timeout <0-65535>

Parameter

<0-65535> Specify session timeout minutes. 0 means never timeout

Default

Default session timeout for all lines are 10 minutes.

Mode

Line Configuration

Usage

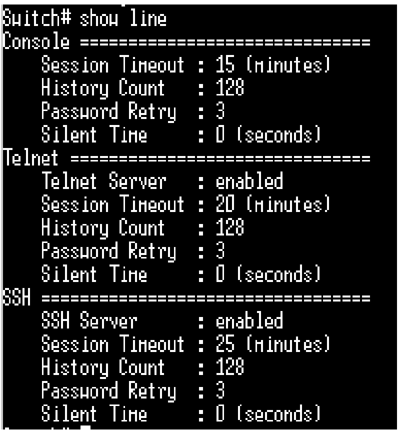
Use “exec-timeout” command to specify the session timeout value for CLI running on console, telnet or ssh service. When user login into CLI and do not do any action after session timeout will be logged out from the CLI session.

Example

This example shows how to change console session timeout to 15min ,telnet session timeout to 20min and ssh session timeout to 25min.

Switch(config)# **line console**
Switch(config-line)# **exec-timeout 15**
Switch(config-line)# **exit**
Switch(config)# **line telnet**
Switch(config-line)# **exec-timeout 20**
Switch(config-line)# **exit**
Switch(config)# **line ssh**
Switch(config-line)# **exec-timeout 25**
Switch(config-line)# **exit**

This example shows how show line information.
Switch# **show line**



```
Switch# show line
Console ==============================
    Session Timeout : 15 (minutes)
    History Count   : 128
    Password Retry  : 3
    Silent Time     : 0 (seconds)
Telnet ==============================
    Telnet Server   : enabled
    Session Timeout : 20 (minutes)
    History Count   : 128
    Password Retry  : 3
    Silent Time     : 0 (seconds)
SSH =================================
    SSH Server      : enabled
    Session Timeout : 25 (minutes)
    History Count   : 128
    Password Retry  : 3
    Silent Time     : 0 (seconds)
```

2.3.25 password-thresh

Syntax

password-thresh <0-120>

Parameter

<0-120> Specify password fail retry number. 0 means no limit.

Default

Default password fail retry number is 3.

Mode

Line Configuration

Usage

Use "**password-thresh**" command to specify the password fail retry number for CLI running on console, telnet or ssh service. When user input password to login and authenticate failed, the fail retry number will increase one. After fail retry number exceed configured one, the CLI will block login for the period of silent time which configured by the command "**silent-time**".

Example

This example shows how to change console fail retry number to 4, telnet fail retry number to 5 and ssh fail retry number to 6.

```
Switch(config)# line console
Switch(config-line)# password-thresh 4
Switch(config-line)# exit
Switch(config)# line telnet

Switch(config-line)# password-thresh 5
 Switch(config-line)# exit
 Switch(config)# line ssh
 Switch(config-line)# password-thresh 6
 Switch(config-line)# exit
```

This example shows how show line information.

```
Switch# show line
Console ==============================
Session Timeout : 10 (minutes)
History Count      : 128
Password Retry   : 4
Silent Time : 0 (seconds)
  Telnet ===============================
Telnet Server      : disabled
Session Timeout : 10 (minutes)
History Count      : 128
Password Retry : 5
Silent Time : 0 (seconds)
```

```
SSH ==================================
SSH Server : disabled
Session Timeout : 10 (minutes)
History Count     : 128
Password Retry : 6
Silent Time : 0 (seconds)
```

2.3.26 ping

Syntax	**ping** HOSTNAME **[count** <1-999999999>**]**
Parameter	HOSTNAME Specify IPv4/IPv6 address or domain name to ping. **count** <1-999999999> Specify how many times to ping.
Default	No default value for this command.
Mode	User EXEC Privileged EXEC
Usage	**Use "**ping**" command to do network ping diagnostic.**
Example	**This example shows how to ping remote host 192.168.1.111.**

```
Switch# ping 192.168.1.111
PING 192.168.1.111 (192.168.1.111): 56 data bytes
64 bytes from 192.168.1.111: icmp_seq=0 ttl=128 time=10.0 ms
64 bytes from 192.168.1.111: icmp_seq=1 ttl=128 time=0.0 ms
64 bytes from 192.168.1.111: icmp_seq=2 ttl=128 time=0.0 ms
64 bytes from 192.168.1.111: icmp_seq=3 ttl=128 time=0.0 ms

--- 192.168.1.111 ping statistics ---
4 packets transmitted, 4 packets received, 0% packet loss
  round-trip min/avg/max = 0.0/2.5/10.0 ms
```

2.3.27 traceroute

Syntax **traceroute** A.B.C.D **[max_hop** <2-255>**]**

Parameter

A.B.C.D	Specify IPv4 to trace.
max_hop <2-255>	Specify maximum hop to trace.

Default No default value for this command.

Mode User EXEC
Privileged EXEC

Usage Use “**traceroute**” command to do network trace route diagnostic.

Example This example shows how to trace route host 192.168.1.111.

Switch# **traceroute 192.168.1.111**

```
traceroute to 192.168.1.111 (192.168.1.111), 30 hops
max, 40 byte packets
1 192.168.1.111 (192.168.1.111)   0 ms   10 ms   0 ms
```

2.3.28 show arp

Syntax **show arp**

Parameter

Default No default value for this command.

Mode User EXEC
Privileged EXEC

Usage Use “**show arp**” command to show all arp entries.

Example This example shows how to show arp entries.

Switch# **show arp**

```
Address        HWtype  HWaddress         Flags Mask    Iface
192.168.1.111  ether 00:0E:2E:F1:4B:3C     C          eth0
```

2.3.29 show cpu utilization

Syntax **show cpu utilization**

Parameter

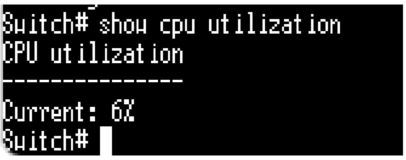
Default No default value for this command.

Mode Privileged EXEC

Usage Use “**show cpu utilization**” command to show current CPU utilization.

Example This example shows how to show current CPU utilization.

Switch# show cpu utilization



```
Switch# show cpu utilization
CPU utilization
---------------
Current: 6%
Switch#
```

2.3.30 show history

Syntax **show history**

Parameter

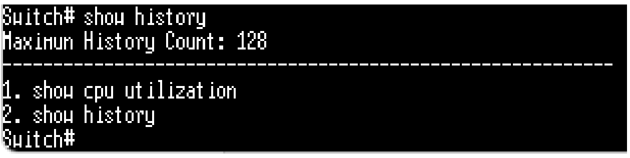
Default No default value for this command

Mode User EXEC /Privileged EXEC /Global Configuration

Usage Use “**show history**” to show commands we input before.

Example The example shows how show history commands

Switch# **show history**



```
Switch# show history
Maximum History Count: 128
-------------------------------------------------------------
1. show cpu utilization
2. show history
Switch#
```

2.3.31 show info

Syntax **show info**

Parameter

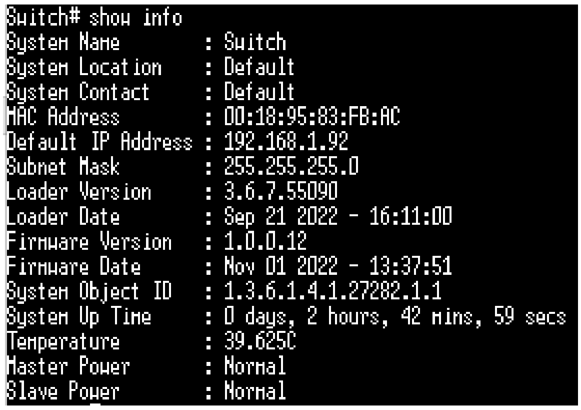
Default No default value for this command

Mode User EXEC /Privileged EXEC

Usage Use "**show info**" command to show system summary information.

Example The example shows how show system version

Switch# **show info**



```
Switch# show info
System Name        : Switch
System Location    : Default
System Contact     : Default
MAC Address        : 00:18:95:83:FB:AC
Default IP Address : 192.168.1.92
Subnet Mask        : 255.255.255.0
Loader Version     : 3.6.7.55090
Loader Date        : Sep 21 2022 - 16:11:00
Firmware Version   : 1.0.0.12
Firmware Date      : Nov 01 2022 - 13:37:51
System Object ID   : 1.3.6.1.4.1.27282.1.1
System Up Time     : 0 days, 2 hours, 42 mins, 59 secs
Temperature        : 39.625C
Master Power       : Normal
Slave Power        : Normal
```

2.3.32 show ip

Syntax **show ip**

Parameter

Default No default value for this command

Mode User EXEC /Privileged EXEC

Usage Use "**show ip**" command to show system IPv4 address, net mask and default gateway.

Example The example shows how to show current ipv4 address of the switch.

Switch# **show info**

```
IP Address: 192.168.1.200
Subnet Netmask: 255.255.255.0
Default Gateway: 192.168.1.254
```

2.3.33 show ip dhcp

Syntax	**show ip dhcp**
Parameter	
Default	No default value for this command
Mode	User EXEC /Privileged EXEC
Usage	Use “**show ip dhcp**” command to show IPv4 dhcp client enable state.
Example	This example shows how to show current dhcp client state of the switch. Switch# **show ip dhcp** `DHCP Status : enabled`

2.3.34 show ip dns

Syntax	**show ip dns**
Parameter	
Default	No default value for this command
Mode	User EXEC /Privileged EXEC
Usage	Use “**show ip dns**” command to show system IPv4 DNS addresses.

Example	This example shows how to show current ipv4 address of the switch.
	Switch# **show ip dns**
	`DNS lookup is enabled`
	`DNS Server 1 : 168.95.1.1`
	`DNS Server 2 : 168.95.192.1`

2.3.35 show ip http

Syntax **show ip（http|https）**

Parameter

Default No default value for this command

Mode Privileged EXEC

Usage Use "**show ip http**" command to show HTTP/HTTPS information.

Example This example shows how to show current ipv4 address of the switch.

```
Switch# show ip http
HTTP daemon : enabled
Session Timeout : 10 (minutes)

Switch# show ip https
HTTPS daemon : enabled
Session Timeout : 10 (minutes)
```

2.3.36 show ipv6

Syntax **show ipv6**

Parameter

Default No default value for this command

Mode User EXEC /Privileged EXEC

Usage Use "**show ipv6**" command to show system IPv6 address, net mask, default gateway and auto config state.

Example This example shows how to show current ipv6 address of the switch.

```
Switch# show ipv6
IPv6 DHCP Configuration   : Disabled
IPv6 DHCP DUID      :
IPv6 Auto Configuration   : Enabled
IPv6 Link Local Address :fe80::dcad:beff:feef:102/64
IPv6 static Address    :fe80::20e:2eff:fef1:4b3c/128
IPv6 static Gateway Address : ::
IPv6 in use Address    :fe80::dcad:beff:feef:102/64
 IPv6 in use Gateway Address : ::
```

2.3.37 show ipv6 dhcp

Syntax **show ipv6**

Parameter

Default No default value for this command

Mode User EXEC /Privileged EXEC

Usage Use “show ipv6 dhcp” command to show system IPv6 dhcp client enable state.

Example This example shows how to show current dhcpv6 client state of the switch.

```
Switch# show ipv6 dhcp
 DHCPv6 Status : enabled
```

2.3.38 show line

Syntax **show line [(console | telnet | ssh)]**

Parameter

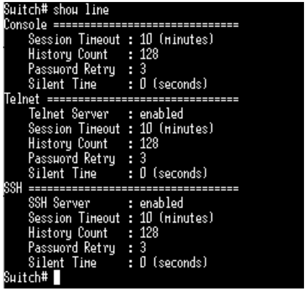
console	Select console line to show.
telnet	Select telnet line to show.
ssh	Select ssh line to show.

Default No default value for this command

Mode Privileged EXEC

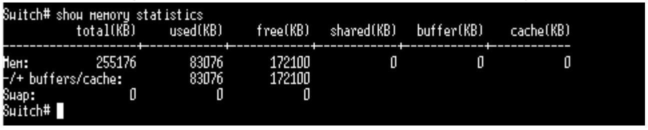
Usage Use “**show line**” command to show all line configurations including session timeout, history count, password retry number and silent time. For telnet and ssh, it also shows the service enable/disable state.

Example This example shows how show all lines’ information.



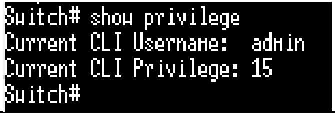
```
Switch# show line
Console ==============================
    Session Timeout : 10 (minutes)
    History Count   : 128
    Password Retry  : 3
    Silent Time     : 0 (seconds)
Telnet ===============================
    Telnet Server   : enabled
    Session Timeout : 10 (minutes)
    History Count   : 128
    Password Retry  : 3
    Silent Time     : 0 (seconds)
SSH ==================================
    SSH Server      : enabled
    Session Timeout : 10 (minutes)
    History Count   : 128
    Password Retry  : 3
    Silent Time     : 0 (seconds)
Switch# 
```

2.3.39 show memory statistics

Syntax	**show memory statistics**
Parameter	
Default	No default value for this command
Mode	Privileged EXEC
Usage	Use “show memory statistics” command to show current memory utilization.
Example	This example show how to show current system memory statistics. 

```
Switch# show memory statistics
           total(KB)    used(KB)    free(KB)  shared(KB)  buffer(KB)   cache(KB)
--------------------+-----------+-----------+-----------+-----------+-----------
Mem:          255176       83076      172100           0           0           0
-/+ buffers/cache:         83076      172100
Swap:              0           0           0
Switch#
```

2.3.40 show privilege

Syntax	**show privilege**
Parameter	
Default	No default value for this command
Mode	User EXEC/Privileged EXEC
Usage	Use “show privilege” command to show the privilege level of the current user.
Example	This example shows how to show privilege. 

```
Switch# show privilege
Current CLI Username:  admin
Current CLI Privilege: 15
Switch#
```

2.3.41 show username

Syntax **show username**

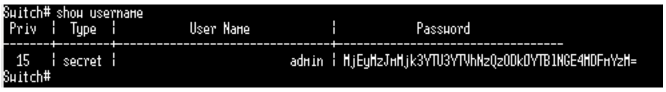
Parameter

Default No default value for this command

Mode Privileged EXEC

Usage Use "**show username**" command show all user accounts in local database.

Example This example shows how to show privilege.



```
Switch# show username
 Priv  ¦  Type  ¦           User Name            ¦            Password
-------+--------+--------------------------------+--------------------------------
  15   ¦ secret ¦                          admin ¦ MjEyMzJmMjk3YTU3YTVhNzQzODk0YTBlNGE4MDFmYzM=
Switch#
```

2.3.42 show users

Syntax **show users**

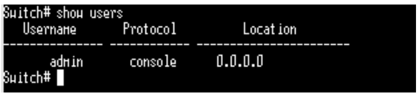
Parameter

Default No default value for this command

Mode Privileged EXEC

Usage Use "**show users**" command show information of all active users.

Example This example shows how to show existing user accounts.



```
Switch# show users
   Username      Protocol          Location
--------------- ------------ -----------------------
      admin       console     0.0.0.0
Switch#
```

2.3.43 show version

Syntax **show versions**

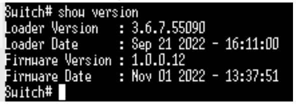
Parameter

Default No default value for this command

Mode User EXEC/Privileged EXEC

Usage Use "**show version**" command to show loader and firmware version and build date.

Example This example shows how to show system version.



```
Switch# show version
Loader Version   : 3.6.7.55090
Loader Date      : Sep 21 2022 - 16:11:00
Firmware Version : 1.0.0.12
Firmware Date    : Nov 01 2022 - 13:37:51
Switch#
```

2.3.44 silent-time

Syntax **silent-time** <0-65535>

Parameter <0-65535> Specify silent time with unit seconds. 0 means do not silent.

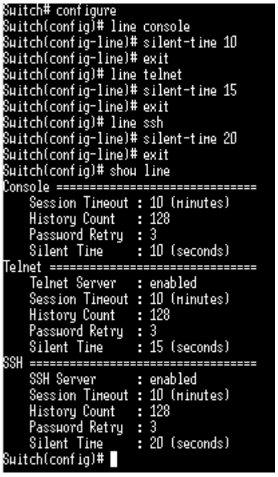
Default Default silent time is 0.

Mode Line Configuration

Usage Use "**silent time**" command to specify the silent time for CLI running on console, telnet or ssh service. When user input password to login and authenticate failed, the fail retry number will increase one. After fail retry number exceed configured one, the CLI will block login for the period of silent time which configured by the command "**silent-time**".

Example This example shows how to change console silent time to 10, telnet silent time to 15 and ssh silent time to 20.

This example shows how show line information.



```
Switch# configure
Switch(config)# line console
Switch(config-line)# silent-time 10
Switch(config-line)# exit
Switch(config)# line telnet
Switch(config-line)# silent-time 15
Switch(config-line)# exit
Switch(config)# line ssh
Switch(config-line)# silent-time 20
Switch(config-line)# exit
Switch(config)# show line
Console ==============================
    Session Timeout : 10 (minutes)
    History Count   : 128
    Password Retry  : 3
    Silent Time     : 10 (seconds)
Telnet ===============================
    Telnet Server   : enabled
    Session Timeout : 10 (minutes)
    History Count   : 128
    Password Retry  : 3
    Silent Time     : 15 (seconds)
SSH ==================================
    SSH Server      : enabled
    Session Timeout : 10 (minutes)
    History Count   : 128
    Password Retry  : 3
    Silent Time     : 20 (seconds)
Switch(config)#
```

2.3.44 ssl

Syntax **ssl**

Parameter

Default No default value for this command

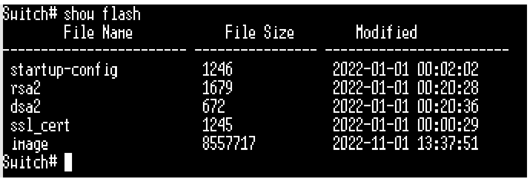
Mode Global Configuration

Usage Use “**ssl**” command to generate security certificate files such as RSA, DSA.

Example This example shows how to generate certificate files.

```
Switch(config)# ssl
```

This example shows how to show the certificate file lists.



```
Switch# show flash
         File Name               File Size          Modified
------------------------- ---------------- -------------------------
 startup-config             1246             2022-01-01 00:02:02
 rsa2                       1679             2022-01-01 00:20:28
 dsa2                       672              2022-01-01 00:20:36
 ssl_cert                   1245             2022-01-01 00:00:29
 image                      8557717          2022-11-01 13:37:51
Switch#
```

2.3.45 system name

Syntax **system name** NAME

Parameter NAME Specify system name string.

Default Default name string is “Switch”.

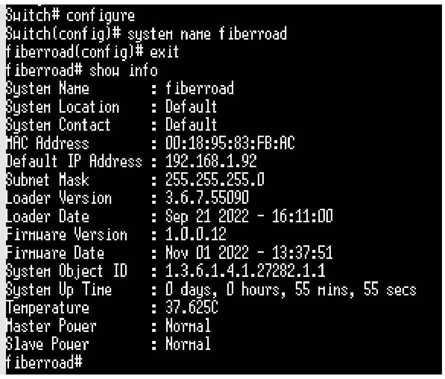
Mode Global Configuration

Usage Use “**system name**” command to modify system name information of the switch. The system name is also used to be CLI prompt.

Example This example shows how to modify contact information

```
Switch(config)# system name fiberroad
fiberroad(config)#
```

This example shows how to show system name information



```
Switch# configure
Switch(config)# system name fiberroad
fiberroad(config)# exit
fiberroad# show info
System Name        : fiberroad
System Location    : Default
System Contact     : Default
MAC Address        : 00:18:95:83:FB:AC
Default IP Address : 192.168.1.92
Subnet Mask        : 255.255.255.0
Loader Version     : 3.6.7.55090
Loader Date        : Sep 21 2022 - 16:11:00
Firmware Version   : 1.0.0.12
Firmware Date      : Nov 01 2022 - 13:37:51
System Object ID   : 1.3.6.1.4.1.27282.1.1
System Up Time     : 0 days, 0 hours, 55 mins, 55 secs
Temperature        : 37.625C
Master Power       : Normal
Slave Power        : Normal
fiberroad#
```

2.3.46 system contact

Syntax **system contact** CONTACT

Parameter CONTACT Specify contact string.

Default Default contact string is “Default Contact”.

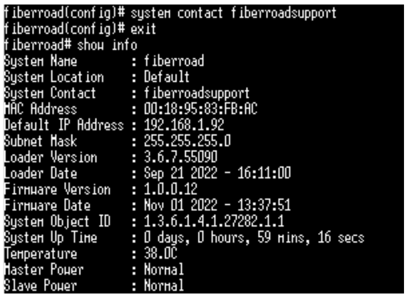
Mode Global Configuration

Usage Use “**system contact**” command to modify contact information of the switch.

Example This example shows how to modify contact information

```
Switch(config)# system contact Fiberroadsupport
```

This example shows how to show system contact information



```
fiberroad(config)# system contact fiberroadsupport
fiberroad(config)# exit
fiberroad# show info
System Name        : fiberroad
System Location    : Default
System Contact     : fiberroadsupport
MAC Address        : 00:18:95:83:FB:AC
Default IP Address : 192.168.1.92
Subnet Mask        : 255.255.255.0
Loader Version     : 3.6.7.55090
Loader Date        : Sep 21 2022 - 16:11:00
Firmware Version   : 1.0.0.12
Firmware Date      : Nov 01 2022 - 13:37:51
System Object ID   : 1.3.6.1.4.1.27282.1.1
System Up Time     : 0 days, 0 hours, 59 mins, 16 secs
Temperature        : 38.0C
Master Power       : Normal
Slave Power        : Normal
```

2.3.47 system location

Syntax **system location** LOCATION

Parameter CONTACT Specify location string.

Default Default location string is “Default Location”.

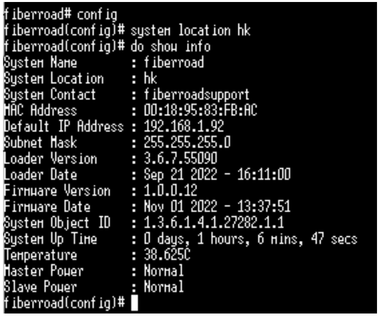
Mode Global Configuration

Usage Use “**system location**” command to modify location information of the switch.

Example This example shows how to modify contact information

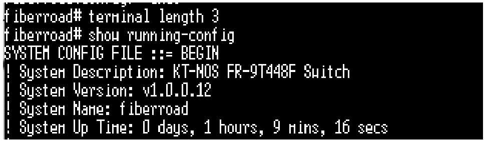
```
Switch(config)# system location home
```

This example shows how to show system location information



```
fiberroad# config
fiberroad(config)# system location hk
fiberroad(config)# do show info
System Name        : fiberroad
System Location    : hk
System Contact     : fiberroadsupport
MAC Address        : 00:18:95:83:FB:AC
Default IP Address : 192.168.1.92
Subnet Mask        : 255.255.255.0
Loader Version     : 3.6.7.55090
Loader Date        : Sep 21 2022 - 16:11:00
Firmware Version   : 1.0.0.12
Firmware Date      : Nov 01 2022 - 13:37:51
System Object ID   : 1.3.6.1.4.1.27282.1.1
System Up Time     : 0 days, 1 hours, 6 mins, 47 secs
Temperature        : 38.625C
Master Power       : Normal
Slave Power        : Normal
fiberroad(config)#
```

2.3.48 terminal length

Syntax	**terminal length** <0-24>
Parameter	<0-24> Specify terminal length value. 0 means no limit.
Default	Default terminal length is 24.
Mode	User EXEC Privileged EXEC
Usage	Use “**terminal length**” command to specify the maximum line number the terminal is able to print.
Example	This example shows how to change terminal length. 

```
fiberroad# terminal length 3
fiberroad# show running-config
SYSTEM CONFIG FILE ::= BEGIN
! System Description: KT-NOS FR-9T448F Switch
! System Version: v1.0.0.12
! System Name: fiberroad
! System Up Time: 0 days, 1 hours, 9 mins, 16 secs
```

2.3.49 username

Syntax

username WORD<0-32> **[privilege (admin|user|**<0-15>**)] (nopassword | password** UNENCRYPY-PASSWORD **| secrect** UNENCRYPY-PASSWORD **| secret encrypted** ENCRYPT-PASSWORD)

no username WORD<0-32>

Parameter

username *WORD<0-32>*	Specify user name to add/delete/edit.
privilege admin	Specify privilege level to be admin (privilege 15)
privilege user	Specify privilege level to be user (privilege 1)
privilege *<0-15>*	Specify custom privilege level
password *UNENCRYPY-PASSWORD*	Specify password string and make it not encrypted.
secret *UNENCRYPY-PASSWORD*	Specify password string and make it encrypted.
secret encrypted *ENCRYPT-PASSWORD*	Enter an encrypted password. Use this keyword to enter a password that is already encrypted (for instance, a password that you copied from another the configuration file of another device).

Default

Default username “admin” has password “admin” with privilege 15.

Mode

Global Configuration

Usage

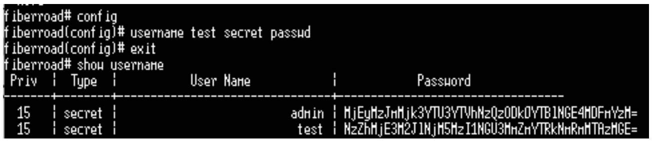
Use “**username**” command to add a new user account or edit an existing user account. And use “**no username**” to delete an existing user account. The user account is a local database for login authentication.

Example

This example shows how to add a new user account.

```
Switch(config)# username test secret passwd
```

This example shows how to show existing user accounts.



```
fiberroad# config
fiberroad(config)# username test secret passwd
fiberroad(config)# exit
fiberroad# show username
 Priv  |  Type  |              User Name              |            Password
-------+--------+-------------------------------------+--------------------------------
  15   | secret |                               admin | MjEyMzJmMjk3YTU3YTVhNzQzODk0YTBlNGE4MDFmYzM=
  15   | secret |                                test | NzZhMjE3M2JlNjM5MzI1NGU3MmZmYTRkNmRmMTAzMGE=
```

2.4 Authentication Manager

2.4.1 authentication

Syntax

authentication (dot1x|mac|web)
no authentication (dot1x|mac|web)

Parameter

Default

Default is disabled for all type

Mode

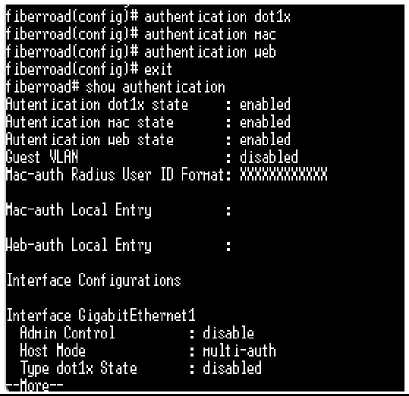
Global Configuration

Usage

Use “**authentication**” command to enable the global setting of 802.1x/MAC/WEB authentication network access control.
Use the **no** form of this command to disable 802.1x/MAC/WEB authentication.

Example

The following example shows how to enable 802.1x/MAC/WEB authentication.



```
fiberroad(config)# authentication dot1x
fiberroad(config)# authentication mac
fiberroad(config)# authentication web
fiberroad(config)# exit
fiberroad# show authentication
Autentication dot1x state     : enabled
Autentication mac state       : enabled
Autentication web state       : enabled
Guest VLAN                    : disabled
Mac-auth Radius User ID Format: XXXXXXXXXXXX

Mac-auth Local Entry          :

Web-auth Local Entry          :

Interface Configurations

Interface GigabitEthernet1
  Admin Control           : disable
  Host Mode               : multi-auth
  Type dot1x State        : disabled
--More--
```

2.4.2 authentication (Interface)

Syntax **authentication (dot1x|mac|web)**
no authentication (dot1x|mac|web)

Parameter

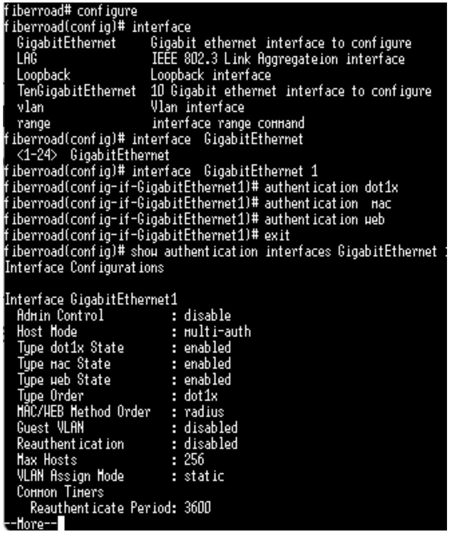
Default Default is disabled for all type

Mode Interface Configuration

Usage Use “**authentication**” command to enable the global setting of 802.1x/MAC/WEB authentication network access control.
Use the **no** form of this command to disable 802.1x/MAC/WEB authentication.

Example The following example shows how to enable 802.1x/MAC/WEB authentication.

```
Switch(config)# interface GigabitEthernet 1
Switch(config-if)# authentication dot1x
Switch(config-if)# authentication mac
Switch(config-if)# authentication web
Switch# show authentication interface
        GigabitEthernet 1
```



```
fiberroad# configure
fiberroad(config)# interface
  GigabitEthernet     Gigabit ethernet interface to configure
  LAG                 IEEE 802.3 Link Aggregateion interface
  Loopback            Loopback interface
  TenGigabitEthernet  10 Gigabit ethernet interface to configure
  vlan                Vlan interface
  range               interface range command
fiberroad(config)# interface  GigabitEthernet
  <1-24>  GigabitEthernet
fiberroad(config)# interface  GigabitEthernet 1
fiberroad(config-if-GigabitEthernet1)# authentication dot1x
fiberroad(config-if-GigabitEthernet1)# authentication  mac
fiberroad(config-if-GigabitEthernet1)# authentication web
fiberroad(config-if-GigabitEthernet1)# exit
fiberroad(config)# show authentication interfaces GigabitEthernet
Interface Configurations

Interface GigabitEthernet1
  Admin Control           : disable
  Host Mode               : multi-auth
  Type dot1x State        : enabled
  Type mac State          : enabled
  Type web State          : enabled
  Type Order              : dot1x
  MAC/WEB Method Order    : radius
  Guest VLAN              : disabled
  Reauthentication        : disabled
  Max Hosts               : 256
  VLAN Assign Mode        : static
  Common Timers
    Reauthenticate Period: 3600
--More--
```

2.4.3 authentication mac radius

Syntax

authentication mac radius [mac-case (lower|upper)] [mac-delimiter(colon|dot|hyphen|none) [gap (2|4|6)]]

Parameter

mac-case (**lower**|**upper**)	Select radius user id to be upper case or lower case.
mac-delimiter (**colon**|**dot**|**hyphen**|**none**)	Select radius user id delimiter colon: XX:XX:XX:XX:XX:XX dot: XX.XX.XX.XX.XX.XX hyphen: XX-XX-XX-XX-XX-XX none: XXXXXXXXXXXX
gap (2|4|6)	Select delimiter gap 2: XX-XX-XX-XX-XX-XX 4: XXXX-XXXX-XXXX 6: XXXXXX-XXXXXX

Default

Default radius id format is upper case with none delimiter.

Mode

Global Configuration

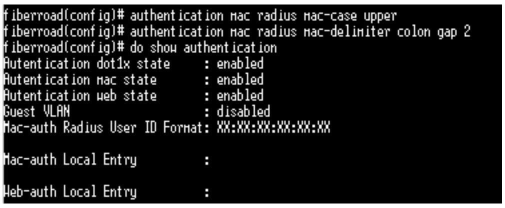
Usage

Use “authentication mac radius” command to configure the radius user id format used by MAC authentication Radius method.

Example

The following example shows how to configure MAC authentication radius id format to be upper case with colon delimiter every 2 chars

```
Switch(config)# authentication mac radius mac- case
                upper
Switch(config)# authentication mac radius mac-
               delimiter colon gap 2
Switch# show authentication
```



```
fiberroad(config)# authentication mac radius mac-case upper
fiberroad(config)# authentication mac radius mac-delimiter colon gap 2
fiberroad(config)# do show authentication
Autentication dot1x state     : enabled
Autentication mac state       : enabled
Autentication web state       : enabled
Guest VLAN                    : disabled
Mac-auth Radius User ID Format: XX:XX:XX:XX:XX:XX

Mac-auth Local Entry          :

Web-auth Local Entry          :
```

2.4.4 authentication mac local

Syntax

authentication mac local mac-addr **control auth [vlan** <1-4094>**]**
[reauth-period <300-4294967294>**] [inactive-timeout** <60-65535>**]**
authentication mac local mac-addr **control unauth no**
authentication mac local mac-addr

Parameter

mac-addr	MAC Authentication local MAC address
control auth	Host with this MAC address will be authorized
control unauth	Host with this MAC address will be force unauthorized
vlan <1-4094>	MAC Authentication host assigned VLAN
reauth-period <300-4294967294 >	MAC Authentication host reauthentication period
inactive-timeout <60-65535>	MAC authentication host inactive timeout

Default

Default is no local MAC Authentication entry.

Mode

Global Configuration

Usage

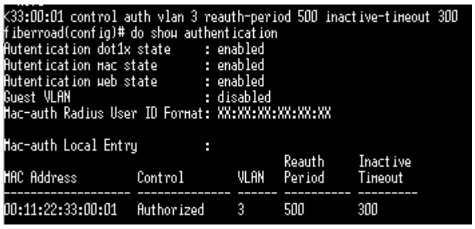
Use “**authentication mac local**” command to add local MAC authentication hosts in database. This local host database is used when MAC authentication method is configured as “local”. The MAC authentication module will find host in this local database and authenticated it.

Use the **no** form of this command to delete local host from database.

Example

The following example shows how to add a new local mac authentication host.

```
Switch(config)# authentication mac local
00:11:22:33:00:01 control auth vlan 3 reauth-
period 500 inactive-timeout 300
Switch# show authentication
```



```
<33:00:01 control auth vlan 3 reauth-period 500 inactive-timeout 300
fiberroad(config)# do show authentication
Autentication dot1x state      : enabled
Autentication mac state        : enabled
Autentication web state        : enabled
Guest VLAN                     : disabled
Mac-auth Radius User ID Format: XX:XX:XX:XX:XX:XX

Mac-auth Local Entry           :
                                          Reauth     Inactive
MAC Address        Control        VLAN   Period     Timeout
------------------ -------------- ------ ---------- ---------
00:11:22:33:00:01  Authorized     3      500        300
```

2.4.5 authentication guest-vlan

Syntax

authentication guest-vlan <1-4094>
no authentication guest-vlan

Parameter

<1-4094> Guest VLAN ID

Default

Default guest VLAN is disabled

Mode

Global Configuration

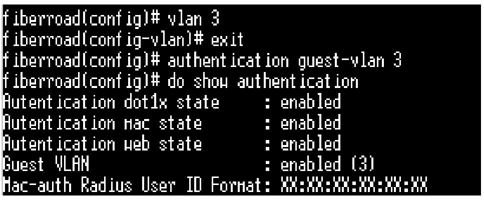
Usage

Use "**authentication guest-vlan**" command to enable the global setting of guest VLAN and specify guest VLAN ID.
Use the **no** form of this command to disable guest VLAN.

Example

The following example shows how to create guest VLAN.

```
Switch(config)# vlan 3
Switch(config-vlan)# exit
Switch(config)# authentication guest-vlan 3
Switch# show authentication
```

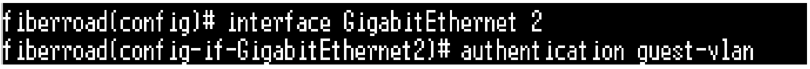


```
fiberroad(config)# vlan 3
fiberroad(config-vlan)# exit
fiberroad(config)# authentication guest-vlan 3
fiberroad(config)# do show authentication
Autentication dot1x state      : enabled
Autentication mac state        : enabled
Autentication web state        : enabled
Guest VLAN                     : enabled (3)
Mac-auth Radius User ID Format: XX:XX:XX:XX:XX:XX
```

2.4.6 authentication guest-vlan(Interface)

Syntax	**authentication guest-vlan** **no authentication guest-vlan**
Parameter	
Default	Default guest VLAN is disabled
Mode	Interface Configuration
Usage	Use “**authentication guest-vlan**” command to enable the port setting of guest VLAN. Use the **no** form of this command to disable guest VLAN.
Example	The following example shows how to enable guest VLAN.

```
Switch(config)# interface GigabitEthernet 2
Switch(config-if)# authentication guest-vlan
```



```
fiberroad(config)# interface GigabitEthernet 2
fiberroad(config-if-GigabitEthernet2)# authentication guest-vlan
```

2.4.7 authentication host-mode

Syntax	**authentication host-mode (multi-auth|multi-host|single-host)** **no authentication host-mode**
Parameter	

Multi-auth	Multiple Authentication Mode. In this mode, every client need to pass authenticate procedure individually.
multi-host	Multiple Host Mode. In this mode, only one client need to be authenticated and other clients will get the same access accessibility.
single-host	Single Host Mode. In this mode, only one host is allowed to be authenticated. It is the same as multi-auth mode with max hosts number configure to be 1.

Default	Default is multi-auth mode.
Mode	Interface Configuration

Usage

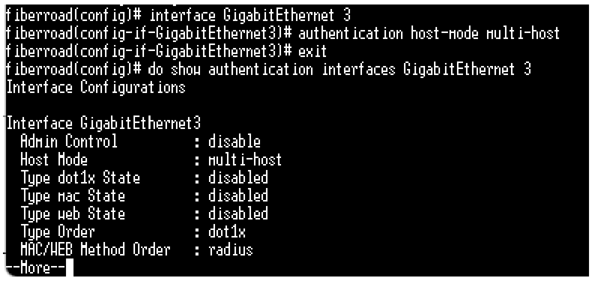
Use "**authentication host-mode**" command to configure the port authentication host mode.

Use the **no** form of this command to restore default value.

Example

The following example shows how to modify port host mode to multi-host.

```
Switch(config)# interface GigabitEthernet 3
Switch(config-if)# authentication host-mode multi-host
Switch# show authentication interface GigabitEthernet3
```



```
fiberroad(config)# interface GigabitEthernet 3
fiberroad(config-if-GigabitEthernet3)# authentication host-mode multi-host
fiberroad(config-if-GigabitEthernet3)# exit
fiberroad(config)# do show authentication interfaces GigabitEthernet 3
Interface Configurations

Interface GigabitEthernet3
  Admin Control          : disable
  Host Mode              : multi-host
  Type dot1x State       : disabled
  Type mac State         : disabled
  Type web State         : disabled
  Type Order             : dot1x
  MAC/WEB Method Order   : radius
--More--
```

2.4.8 authentication max-hosts

Syntax

authentication max-hosts <1-256>

no authentication max-hosts

Parameter

<1-256> Available max host number in multi-auth mode.

Default

Default max host number is 256

Mode

Interface Configuration

Usage

Use "**authentication max-hosts**" command to configure the port max hosts number for multi-auth mode. The host exceed the max host number is not allowed to create authentication session and do authenticating.

Use **no** form of this command to restore default value.

Example

The following example shows how to change port max hosts number.

```
Switch(config)# interface gigabitethernet 1
Switch(config-if)# authentication max-hosts 100
Switch# show mac-auth interface gigabitethernet 1
Interface GigabitEthernet1
Admin Control  : disable
Host Mode  : multi-auth
Type dot1x State   : disabled
Type mac State : disabled
Type web State : disabled
Type Order  : dot1x MAC/WEB Method Order    : radius
Guest VLAN  : disabled
Reauthentication   : disabled
Max Hosts   : 100
```

2.4.9 authentication method

Syntax

authentication method (local [radius] | radius [local])
no authentication order

Parameter

local	Use local account to authenticate
radius	Use remote RADIUS server to authenticate

Default

Default is RADIUS method in first place and no other method.

Mode

Interface Configuration

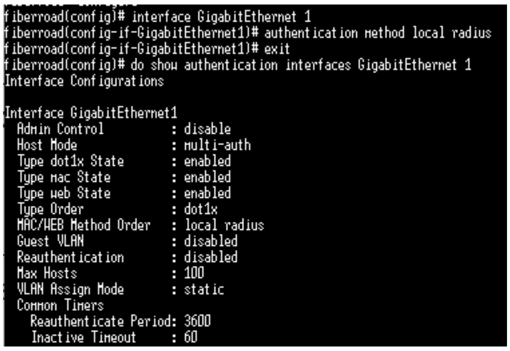
Usage

Use “**authentication method**” command to configure the port authentication method order.
Use the **no** form of this command to restore default value.

Example

The following example shows how to modify port authentication order to local and then RADIUS.

```
Switch(config)# interface GigabitEthernet 1
Switch(config-if)# authentication method local radius
Switch#show authentication interface GigabitEthernet 1
```



```
fiberroad(config)# interface GigabitEthernet 1
fiberroad(config-if-GigabitEthernet1)# authentication method local radius
fiberroad(config-if-GigabitEthernet1)# exit
fiberroad(config)# do show authentication interfaces GigabitEthernet 1
Interface Configurations

Interface GigabitEthernet1
  Admin Control           : disable
  Host Mode               : multi-auth
  Type dot1x State        : enabled
  Type mac State          : enabled
  Type web State          : enabled
  Type Order              : dot1x
  MAC/WEB Method Order    : local radius
  Guest VLAN              : disabled
  Reauthentication        : disabled
  Max Hosts               : 100
  VLAN Assign Mode        : static
  Common Timers
    Reauthenticate Period: 3600
    Inactive Timeout     : 60
```

2.4.10 authentication order

Syntax

authentication order (dot1x [mac] [web] | mac [dot1x] [web] |web)
no authentication order

Parameter

dot1x	Authenticating user by IEEE 802.1X
mac	Authenticating user by mac based authentication
web	Authenticating user by web based authentication

Default

Default is dot1x type in first place and no other types.

Mode

Interface Configuration

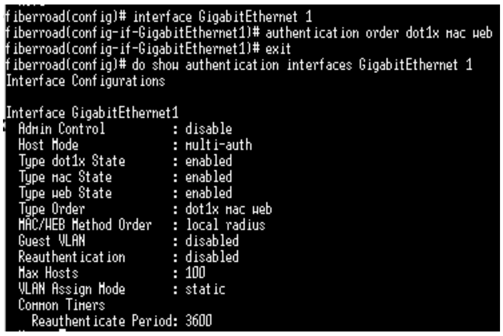
Usage

Use "**authentication order**" command to configure the port authentication type order.
Use the **no** form of this command to restore default value.

Example

The following example shows how to modify port authentication order to dot1x, mac and web.

```
Switch(config)# interface fa1
Switch(config-if)# authentication order dot1x mac web
Switch# show authentication interface fa1
```



```
fiberroad(config)# interface GigabitEthernet 1
fiberroad(config-if-GigabitEthernet1)# authentication order dot1x mac web
fiberroad(config-if-GigabitEthernet1)# exit
fiberroad(config)# do show authentication interfaces GigabitEthernet 1
Interface Configurations

Interface GigabitEthernet1
  Admin Control          : disable
  Host Mode              : multi-auth
  Type dot1x State       : enabled
  Type mac State         : enabled
  Type web State         : enabled
  Type Order             : dot1x mac web
  MAC/WEB Method Order   : local radius
  Guest VLAN             : disabled
  Reauthentication       : disabled
  Max Hosts              : 100
  VLAN Assign Mode       : static
  Common Timers
    Reauthenticate Period: 3600
```

2.4.11 authentication port-control

Syntax

authentication port-control (auto|force-auth|force-unauth)
no authentication port-control

Parameter

auto	Need passing authentication procedure to get network accessibility
force-auth	Port is force authorized and all clients have network accessibility
force-unauth	Port is force unauthorized and all clients have no network accessibility

Default

Default is disabled.

Mode

Interface Configuration

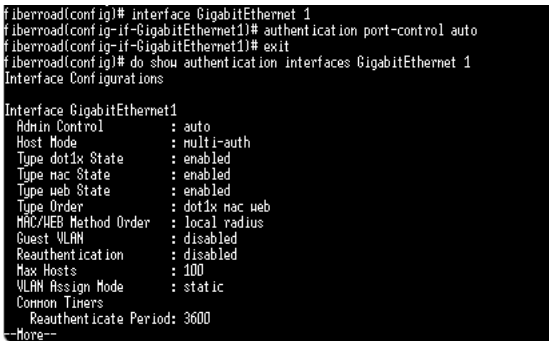
Usage

Use "**authentication port-control**" command to enable the port authentication control mode.
Use the **no** form of this command to disable authentication port control.

Example

The following example shows how to configure port control to auto mode.

```
Switch(config)# interface GigabitEthernet 1
Switch(config-if)# authentication port-control auto
Switch#show authentication interface GigabitEthernet1
```



```
fiberroad(config)# interface GigabitEthernet 1
fiberroad(config-if-GigabitEthernet1)# authentication port-control auto
fiberroad(config-if-GigabitEthernet1)# exit
fiberroad(config)# do show authentication interfaces GigabitEthernet 1
Interface Configurations

Interface GigabitEthernet1
  Admin Control          : auto
  Host Mode              : multi-auth
  Type dot1x State       : enabled
  Type mac State         : enabled
  Type web State         : enabled
  Type Order             : dot1x mac web
  MAC/WEB Method Order   : local radius
  Guest VLAN             : disabled
  Reauthentication       : disabled
  Max Hosts              : 100
  VLAN Assign Mode       : static
  Common Timers
    Reauthenticate Period: 3600
--More--
```

2.4.12 authentication radius-attribution vlan

Syntax

authentication radius-attributes vlan (reject | static)
no authentication radius-attributes vlan

Parameter

reject	If get VLAN authorized information, just use it. However, if there is no VLAN authorized information, reject the host and make it unauthorized.
static	If get VLAN authorized information, just use it. If there is no VLAN authorized information, keep original VLAN of host.

Default

Default radius attributes VLAN assign mode is static.

Mode

Interface Configuration

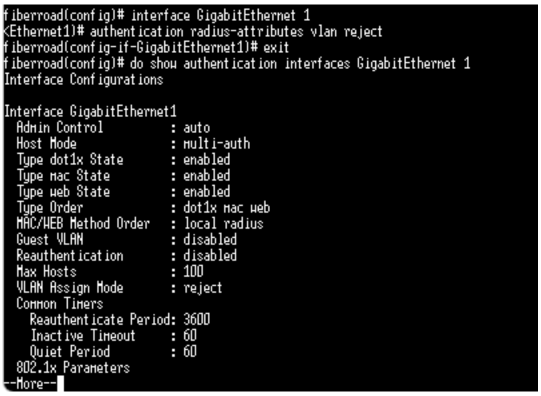
Usage

Use “**authentication radius-attributes vlan**” command to configure the port RADIUS VLAN assign mode.
Use the **no** form of this command to disable the port RADIUS VLAN assign.

Example

The following example shows how to configure port VLAN assign to reject mode.

```
Switch(config)# interface GigabitEthernet 1
Switch(config-if)# authentication radius-attributes
                        vlan reject
Switch# show authentication interface
         GigabitEthernet 1
```



```
fiberroad(config)# interface GigabitEthernet 1
<Ethernet1)# authentication radius-attributes vlan reject
fiberroad(config-if-GigabitEthernet1)# exit
fiberroad(config)# do show authentication interfaces GigabitEthernet 1
Interface Configurations

Interface GigabitEthernet1
  Admin Control           : auto
  Host Mode               : multi-auth
  Type dot1x State        : enabled
  Type mac State          : enabled
  Type web State          : enabled
  Type Order              : dot1x mac web
  MAC/WEB Method Order    : local radius
  Guest VLAN              : disabled
  Reauthentication        : disabled
  Max Hosts               : 100
  VLAN Assign Mode        : reject
  Common Timers
    Reauthenticate Period: 3600
    Inactive Timeout      : 60
    Quiet Period          : 60
  802.1x Parameters
--More--
```

2.4.13 authentication reauth

Syntax

authentication reauth
no authentication reauth

Parameter

Default

Default is disabled.

Mode

Interface Configuration

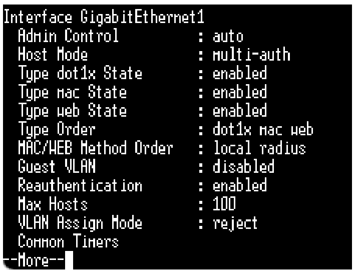
Usage

Use “**authentication reauth**” command to enable the port reauthentication.
Use the no form of this command to disable reauthentication.

Example

The following example shows how to enable port reauthentication.

```
Switch(config)# interface GigabitEthernet 1
Switch(config-if)# authentication reauth
Switch# show authentication interface
        GigabitEthernet 1
```



```
Interface GigabitEthernet1
  Admin Control           : auto
  Host Mode               : multi-auth
  Type dot1x State        : enabled
  Type mac State          : enabled
  Type web State          : enabled
  Type Order              : dot1x mac web
  MAC/WEB Method Order    : local radius
  Guest VLAN              : disabled
  Reauthentication        : enabled
  Max Hosts               : 100
  VLAN Assign Mode        : reject
  Common Timers
--More--
```

2.4.14 authentication timer inactive

Syntax

authentication timer inactive <60-65535>
no authentication timer inactive

Parameter

<60-65535> **Interval in seconds after which if there is no activity from the client then it will be unauthorized**

Default

Default inactive timeout is 60 seconds.

Mode

Interface Configuration

Usage

Use "**authentication timer inactive**" command to configure the port inactive timeout value.

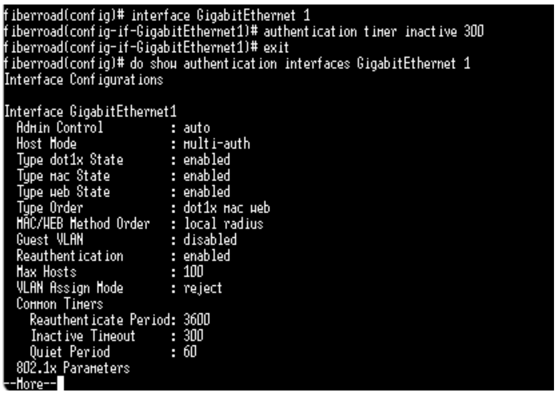
Sometimes, we may assign a long aging time for a host, but in fact, it is not active. This inactive timeout will detect the host is active or not. If the host is inactive exceed this timeout, it should be removed.

Use **no** form of this command to restore default value.

Example

The following example shows how to configure port inactive period.

```
Switch(config)# interface GigabitEthernet 1
Switch(config-if)# authentication timer inactive 300
Switch#show authentication interface GigabitEthernet 1
```



```
fiberroad(config)# interface GigabitEthernet 1
fiberroad(config-if-GigabitEthernet1)# authentication timer inactive 300
fiberroad(config-if-GigabitEthernet1)# exit
fiberroad(config)# do show authentication interfaces GigabitEthernet 1
Interface Configurations

Interface GigabitEthernet1
  Admin Control            : auto
  Host Mode                : multi-auth
  Type dot1x State         : enabled
  Type mac State           : enabled
  Type web State           : enabled
  Type Order               : dot1x mac web
  MAC/WEB Method Order     : local radius
  Guest VLAN               : disabled
  Reauthentication         : enabled
  Max Hosts                : 100
  VLAN Assign Mode         : reject
  Common Timers
    Reauthenticate Period: 3600
    Inactive Timeout     : 300
    Quiet Period         : 60
  802.1x Parameters
--More--
```

2.4.15 authentication timer quiet

Syntax

authentication timer quiet <0-65535>
no authentication timer quiet

Parameter

<0-65535> **Interval in seconds to wait following a failed authentication exchange**

Default

Default quiet period is 60 seconds.

Mode

Interface Configuration

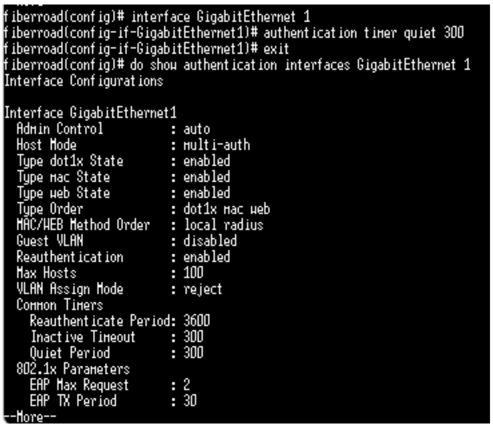
Usage

Use "**authentication timer quiet**" command to configure the port quiet period value.
After authenticating fail many times and the port is guest VLAN disabled, the port/host will enter lock state until quiet period expired. In lock state, the port/host is not allowed to do authenticating.
Use **no** form of this command to restore default value.

Example

The following example shows how to configure port quiet period.

```
Switch(config)# interface GigabitEthernet 1
Switch(config-if)# authentication timer quiet 300
Switch#show authentication interface GigabitEthernet 1
```



```
fiberroad(config)# interface GigabitEthernet 1
fiberroad(config-if-GigabitEthernet1)# authentication timer quiet 300
fiberroad(config-if-GigabitEthernet1)# exit
fiberroad(config)# do show authentication interfaces GigabitEthernet 1
Interface Configurations

Interface GigabitEthernet1
  Admin Control            : auto
  Host Mode                : multi-auth
  Type dot1x State         : enabled
  Type mac State           : enabled
  Type web State           : enabled
  Type Order               : dot1x mac web
  MAC/WEB Method Order     : local radius
  Guest VLAN               : disabled
  Reauthentication         : enabled
  Max Hosts                : 100
  VLAN Assign Mode         : reject
  Common Timers
    Reauthenticate Period: 3600
    Inactive Timeout     : 300
    Quiet Period         : 300
  802.1x Parameters
    EAP Max Request      : 2
    EAP TX Period        : 30
--More--
```

2.4.16 authentication timer reauth

Syntax

authentication timer reauth <300-4294967294>
no authentication timer reauth

Parameter

<300-4294967294>	Time in seconds after which an automatic re-authentication should be initiated

Default

Default reauthentication period is 3600 seconds.

Mode

Interface Configuration

Usage

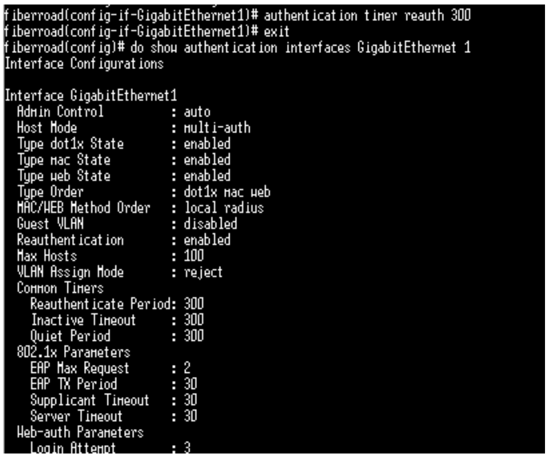
Use "**authentication timer reauth**" command to configure the port reauthentication period value with unit second if the reauthentication time is not assigned by local database or remote authentication server. On the other hand, if the reauthentication time is assigned by local database or remote server, this configured reauthentication time will be ignored.

Use **no** form of this command to restore default value.

Example

The following example shows how to configure port reauthentication period.

```
Switch(config)# interface GigabitEthernet 1
Switch(config-if)# authentication timer reauth 300
Switch# show authentication interface GigabitEthernet1
```



```
fiberroad(config-if-GigabitEthernet1)# authentication timer reauth 300
fiberroad(config-if-GigabitEthernet1)# exit
fiberroad(config)# do show authentication interfaces GigabitEthernet 1
Interface Configurations

Interface GigabitEthernet1
  Admin Control          : auto
  Host Mode              : multi-auth
  Type dot1x State       : enabled
  Type mac State         : enabled
  Type web State         : enabled
  Type Order             : dot1x mac web
  MAC/WEB Method Order   : local radius
  Guest VLAN             : disabled
  Reauthentication       : enabled
  Max Hosts              : 100
  VLAN Assign Mode       : reject
  Common Timers
    Reauthenticate Period: 300
    Inactive Timeout     : 300
    Quiet Period         : 300
  802.1x Parameters
    EAP Max Request      : 2
    EAP TX Period        : 30
    Supplicant Timeout   : 30
    Server Timeout       : 30
  Web-auth Parameters
    Login Attempt        : 3
```

2.4.17 authentication web local

Syntax

authentication web local username USERNAME password (encrypted CRYPT-PASSWORD | PASSWORD) [vlan <1-4094>] [reauth-period <300-4294967294>] [inactive-timeout <60-65535>]
no authentication web local username USERNAME

Parameter

USERNAME	Local account user name
encrypted CRYPT-PASSWORD	Encrypted password.
PASSWORD	Un-encrypted password.
vlan <1-4094>	Assigned VLAN of this local account
reauth-period <300-4294967294>	Reauthentication period of this local account
inactive-timeout <60-65535>	Inactive timeout of this local account

Default

Default is no local authentication entry.

Mode

Global Configuration

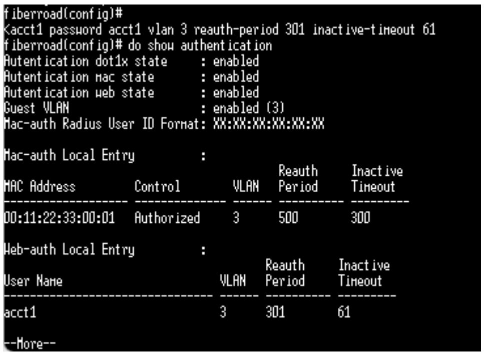
Usage

Use "**authentication web local**" command to add local account in database. This local account database is used when web authentication method is configured as "local". The web authentication module will find account in this local database and authenticated it.
Use the **no** form of this command to delete local account from database.

Example

The following example shows how to add/delete a new local account.

```
Switch(config)# authentication web local username acct1 password acct1 vlan 3 reauth-period 301 inactive-timeout 61
Switch# show authentication
```



```
fiberroad(config)#
<acct1 password acct1 vlan 3 reauth-period 301 inactive-timeout 61
fiberroad(config)# do show authentication
Autentication dot1x state     : enabled
Autentication mac state       : enabled
Autentication web state       : enabled
Guest VLAN                    : enabled (3)
Mac-auth Radius User ID Format: XX:XX:XX:XX:XX:XX

Mac-auth Local Entry          :
                                          Reauth     Inactive
MAC Address       Control        VLAN     Period     Timeout
----------------- ------------- ------ ---------- ---------
00:11:22:33:00:01 Authorized     3      500        300

Web-auth Local Entry          :
                                       Reauth     Inactive
User Name                      VLAN   Period     Timeout
------------------------------ ------ ---------- ---------
acct1                          3      301        61

--More--
```

2.4.18 authentication web max-login-attempts

Syntax

authentication web max-login-attempts (infinite|<3-10>)
no authentication web max-login-attempts

Parameter

infinite	Do not care user login fail number
<3-10>	Allow user login fail number

Default

Default max login attempt number is 3.

Mode

Interface Configuration

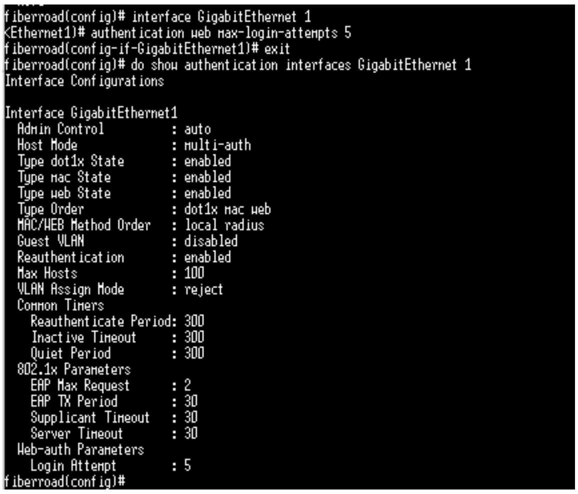
Usage

Use "**authentication web max-login-attempts**" command to configure the port WEB authentication max login attempt number. After login fail number exceed, the host will enter Lock state and is not able to authenticate until quiet period exceed.
Use **no** form of this command to restore default value.

Example

The following example shows how to configure port max login attempt number.

```
Switch(config)# interface GigabitEthernet 1
Switch(config-if)# authentication web max-login-
                   attempts 5
Switch# show authentication interface GigabitEthernet 1
```



```
fiberroad(config)# interface GigabitEthernet 1
<Ethernet1)# authentication web max-login-attempts 5
fiberroad(config-if-GigabitEthernet1)# exit
fiberroad(config)# do show authentication interfaces GigabitEthernet 1
Interface Configurations

Interface GigabitEthernet1
  Admin Control           : auto
  Host Mode               : multi-auth
  Type dot1x State        : enabled
  Type mac State          : enabled
  Type web State          : enabled
  Type Order              : dot1x mac web
  MAC/WEB Method Order    : local radius
  Guest VLAN              : disabled
  Reauthentication        : enabled
  Max Hosts               : 100
  VLAN Assign Mode        : reject
  Common Timers
    Reauthenticate Period: 300
    Inactive Timeout      : 300
    Quiet Period          : 300
  802.1x Parameters
    EAP Max Request       : 2
    EAP TX Period         : 30
    Supplicant Timeout    : 30
    Server Timeout        : 30
  Web-auth Parameters
    Login Attempt         : 5
fiberroad(config)#
```

2.4.19 clear authentication sessions

Syntax

clear authentication sessions
clear authentication sessions interfaces IF_PORTS
clear authentication sessions mac mac-addr
clear authentication sessions session-id WORD
clear authentication sessions type (dot1x|mac|web)

Parameter

interfaces IF_PORTS	Clear sessions on specific interface
mac mac-addr	Clear session with specific MAC address
session-id WORD	Clear session with specific session ID
type (dot1x|mac|web)	Clear session with specific authentication type

Default

Default is no local authentication entry.

Mode

Privileged EXEC

Usage

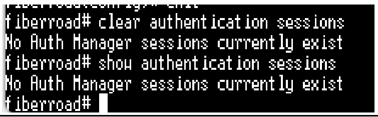
Use "**clear authentication sessions**" command to delete existing authentication sessions. If no parameter is specified, all sessions will be deleted.

After authentication session is deleted, host need to do authentication procedure again.

Example

The following example shows how to clear all authentication sessions.

```
Switch# clear authentication sessions
Switch# show authentication sessions
```



```
fiberroad# clear authentication sessions
No Auth Manager sessions currently exist
fiberroad# show authentication sessions
No Auth Manager sessions currently exist
fiberroad#
```

2.4.20 dot1x

Syntax

dot1x / no dot1x

Parameter

Default

Default 802.1x is disabled

Mode

Global Configuration

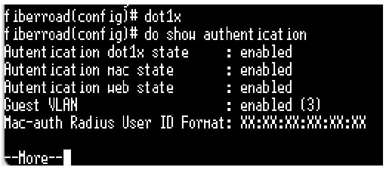
Usage

Use "**dot1x**" command to enable the global setting of 802.1x. The "**authentication dot1x**" command has the same effect as this one.
This command is a backward compatible command.
Use the **no** form of this command to disable 802.1x authentication.

Example

The following example shows how to enable 802.1x authentication.

```
Switch(config)# dot1x
Switch# show authentication
```



```
fiberroad(config)# dot1x
fiberroad(config)# do show authentication
Autentication dot1x state     : enabled
Autentication mac state       : enabled
Autentication web state       : enabled
Guest VLAN                    : enabled (3)
Mac-auth Radius User ID Format: XX:XX:XX:XX:XX:XX

--More--
```

2.4.21 dot1x guest-vlan

Syntax

dot1x guest-vlan <1-4094>
no dot1x guest-vlan

Parameter

<1-4094> Guest VLAN ID

Default

Default guest VLAN is disabled

Mode

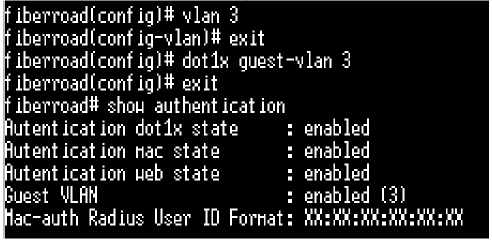
Global Configuration

Usage

Use "**dot1x guest-vlan**" command to enable the global setting of guest VLAN and specify guest VLAN ID.
Use the **no** form of this command to disable guest VLAN.

Example

The following example shows how to enable 802.1x authentication.
The following example shows how to create guest VLAN.



```
fiberroad(config)# vlan 3
fiberroad(config-vlan)# exit
fiberroad(config)# dot1x guest-vlan 3
fiberroad(config)# exit
fiberroad# show authentication
Autentication dot1x state     : enabled
Autentication mac state       : enabled
Autentication web state       : enabled
Guest VLAN                    : enabled (3)
Mac-auth Radius User ID Format: XX:XX:XX:XX:XX:XX
```

2.4.22 dot1x max-req

Syntax

dot1x max-req <1-10>
no dot1x max-req

Parameter

<1-10> The maximum number of EAP requests that can be sent. If a response is not received after the defined period (supplicant timeout),the authentication process is restarted.

Default

Default EAP max request number is 2.

Mode

Interface Configuration

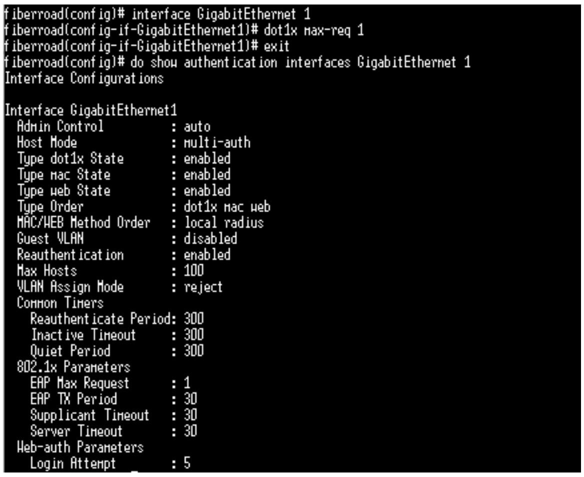
Usage

Use “**dot1x max-req**” command to configure the port 802.1x max EAP request value. The max request is the maximum number of EAP requests that can be sent. If a response is not received after the defined period (supplicant timeout), the authentication process is restarted.
Use **no** form of this command to restore default value.

Example

The following example shows how to configure port 802.1x EAP TX period.

```
Switch(config)# interface GigabitEthernet 1
Switch(config-if)# dot1x max-req 1
Switch# show authentication interface
        GigabitEthernet 1
```



```
fiberroad(config)# interface GigabitEthernet 1
fiberroad(config-if-GigabitEthernet1)# dot1x max-req 1
fiberroad(config-if-GigabitEthernet1)# exit
fiberroad(config)# do show authentication interfaces GigabitEthernet 1
Interface Configurations

Interface GigabitEthernet1
  Admin Control           : auto
  Host Mode               : multi-auth
  Type dot1x State        : enabled
  Type mac State          : enabled
  Type web State          : enabled
  Type Order              : dot1x mac web
  MAC/WEB Method Order    : local radius
  Guest VLAN              : disabled
  Reauthentication        : enabled
  Max Hosts               : 100
  VLAN Assign Mode        : reject
  Common Timers
    Reauthenticate Period: 300
    Inactive Timeout      : 300
    Quiet Period          : 300
  802.1x Parameters
    EAP Max Request       : 1
    EAP TX Period         : 30
    Supplicant Timeout    : 30
    Server Timeout        : 30
  Web-auth Parameters
    Login Attempt         : 5
```

2.4.23 dot1x port-control

Syntax

dot1x port-control (auto|force-auth|force-unauth)
no dot1x port-control

Parameter

auto	Need passing authentication procedure to get network accessibility
force-auth	Port is force authorized and all clients have network accessibility.
Force-unauth	Port is force unauthorized and all clients have no network accessibility.

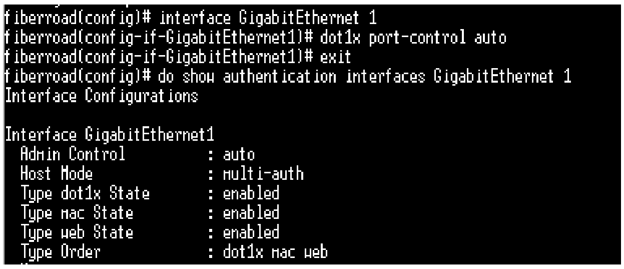
Default Default is disabled.

Mode Interface Configuration

Usage Use "**dot1x port-control**" command to enable the port authentication control mode. The "**authentication port-control**" command has the same effect. Use the **no** form of this command to disable authentication port control.

Example The following example shows how to configure port control to auto mode.

```
Switch(config)# interface fa1
Switch(config-if)# dot1x port-control auto
Switch# show authentication interface fa1
```



```
fiberroad(config)# interface GigabitEthernet 1
fiberroad(config-if-GigabitEthernet1)# dot1x port-control auto
fiberroad(config-if-GigabitEthernet1)# exit
fiberroad(config)# do show authentication interfaces GigabitEthernet 1
Interface Configurations

Interface GigabitEthernet1
  Admin Control            : auto
  Host Mode                : multi-auth
  Type dot1x State         : enabled
  Type mac State           : enabled
  Type web State           : enabled
  Type Order               : dot1x mac web
```

2.4.24 dot1x reauth

Syntax **dot1x reauth / no dot1x reauth**

Parameter

Default Default is disabled.

Mode Interface Configuration

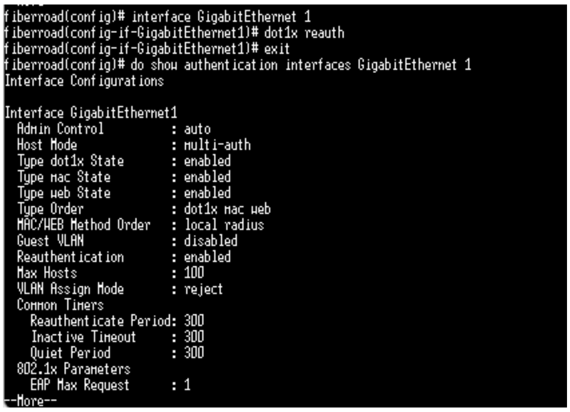
Usage Use “**dot1x reauth**” command to enable the port reauthentication.

The “**authentication reauth**” command has the same effect, it is a backward compatible command

Use the **no** form of this command to disable reauthentication.

Example The following example shows how to enable port reauthentication.

```
Switch(config)# interface GigabitEthernet 1
Switch(config-if)# dot1x reauth
Switch# show authentication interface GigabitEthernet 1
```



```
fiberroad(config)# interface GigabitEthernet 1
fiberroad(config-if-GigabitEthernet1)# dot1x reauth
fiberroad(config-if-GigabitEthernet1)# exit
fiberroad(config)# do show authentication interfaces GigabitEthernet 1
Interface Configurations

Interface GigabitEthernet1
  Admin Control          : auto
  Host Mode              : multi-auth
  Type dot1x State       : enabled
  Type mac State         : enabled
  Type web State         : enabled
  Type Order             : dot1x mac web
  MAC/WEB Method Order   : local radius
  Guest VLAN             : disabled
  Reauthentication       : enabled
  Max Hosts              : 100
  VLAN Assign Mode       : reject
  Common Timers
    Reauthenticate Period: 300
    Inactive Timeout     : 300
    Quiet Period         : 300
  802.1x Parameters
    EAP Max Request      : 1
--More--
```

2.4.25 dot1x timeout reauth-period

Syntax

dot1x timeout reauth-period <300-4294967294>
no dot1x timeout reauth-period

Parameter

<300-4294967294> Time in seconds after which an automatic re-authentication should be initiated

Default

Default reauthentication period is 3600 seconds.

Mode

Interface Configuration

Usage

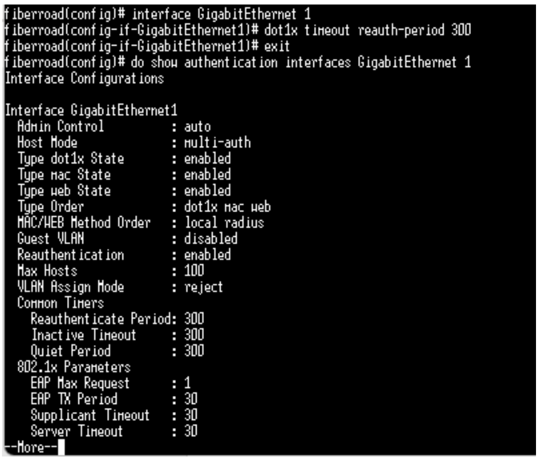
Use "**dot1x timout reauth**" command to configure the port reauthentication period value with unit second if the reauthentication time is not assigned by local database or remote authentication server. On the other hand, if the reauthentication time is assigned by local database or remote server, this configured reauthentication time will be ignored.
The "**authentication timer reauth**" command has the same effect and it is a backward compatible command.

Use no form of this command to restore default value.

Example

The following example shows how to configure port 802.1x reauthentication period.

```
Switch(config)#interface GigabitEthernet 1
Switch(config-if)#dot1x timeout reauth-period 300
Switch#show authentication interface GigabitEthernet 1
```



```
fiberroad(config)# interface GigabitEthernet 1
fiberroad(config-if-GigabitEthernet1)# dot1x timeout reauth-period 300
fiberroad(config-if-GigabitEthernet1)# exit
fiberroad(config)# do show authentication interfaces GigabitEthernet 1
Interface Configurations

Interface GigabitEthernet1
  Admin Control          : auto
  Host Mode              : multi-auth
  Type dot1x State       : enabled
  Type mac State         : enabled
  Type web State         : enabled
  Type Order             : dot1x mac web
  MAC/WEB Method Order   : local radius
  Guest VLAN             : disabled
  Reauthentication       : enabled
  Max Hosts              : 100
  VLAN Assign Mode       : reject
  Common Timers
    Reauthenticate Period: 300
    Inactive Timeout     : 300
    Quiet Period         : 300
  802.1x Parameters
    EAP Max Request      : 1
    EAP TX Period        : 30
    Supplicant Timeout   : 30
    Server Timeout       : 30
--More--
```

2.4.26 dot1x timeout quiet-period

Syntax

dot1x timeout quiet-period <0-65535>
no dot1x timeout quiet-period

Parameter

<0-65535> Interval in seconds to wait following a failed authentication exchange

Default

Default quiet period is 60 seconds.

Mode

Interface Configuration

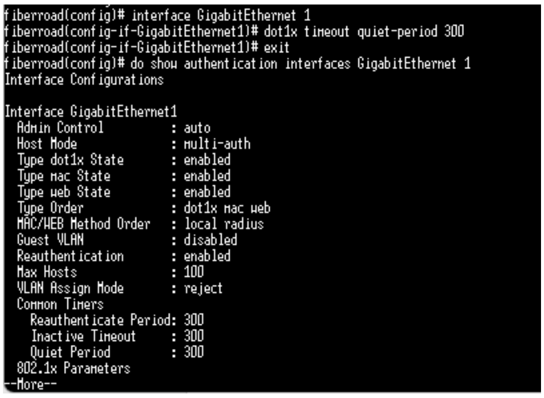
Usage

Use “**dot1x timeout quiet-period**” command to configure the port quiet period value. The “**authentication timer quiet**” command has the same effect and it is backward compatible command.
After authenticating fail many times and the port is guest VLAN disabled, the port/host will enter lock state until quiet period expired.
In lock state, the port/host is not allowed to do authenticating.
Use **no** form of this command to restore default value.

Example

The following example shows how to configure port 802.1x quiet period.

```
Switch(config)# interface GigabitEthernet 1
Switch(config-if)# dot1x timeout quiet-period 300
Switch# show authentication GigabitEthernet 1
```



```
fiberroad(config)# interface GigabitEthernet 1
fiberroad(config-if-GigabitEthernet1)# dot1x timeout quiet-period 300
fiberroad(config-if-GigabitEthernet1)# exit
fiberroad(config)# do show authentication interfaces GigabitEthernet 1
Interface Configurations

Interface GigabitEthernet1
  Admin Control          : auto
  Host Mode              : multi-auth
  Type dot1x State       : enabled
  Type mac State         : enabled
  Type web State         : enabled
  Type Order             : dot1x mac web
  MAC/WEB Method Order   : local radius
  Guest VLAN             : disabled
  Reauthentication       : enabled
  Max Hosts              : 100
  VLAN Assign Mode       : reject
  Common Timers
    Reauthenticate Period: 300
    Inactive Timeout     : 300
    Quiet Period         : 300
  802.1x Parameters
--More--
```

2.4.27 dot1x timeout server-timeout

Syntax

dot1x timeout server-timeout <1-65535>
no dot1x timeout server-timeout

Parameter

<1-65535> Number of seconds that lapses before the device resends a request to the authentication server.

Default

Default server timeout is 30 seconds.

Mode

Interface Configuration

Usage

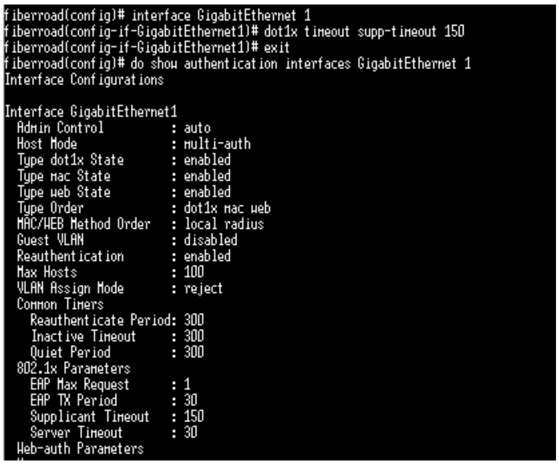
Use “**dot1x timeout server-timeout**” command to configure the port 802.1x server timeout value. The server timeout is the number of seconds that lapses before the device resends a request to the authentication server.

Use **no** form of this command to restore default value.

Example

The following example shows how to configure port 802.1x server timeout.

```
Switch(config)# interface GigabitEthernet 1
Switch(config-if)# dot1x timeout supp-timeout 150
Switch# show authentication interface GigabitEthernet 1
```



```
fiberroad(config)# interface GigabitEthernet 1
fiberroad(config-if-GigabitEthernet1)# dot1x timeout supp-timeout 150
fiberroad(config-if-GigabitEthernet1)# exit
fiberroad(config)# do show authentication interfaces GigabitEthernet 1
Interface Configurations

Interface GigabitEthernet1
  Admin Control          : auto
  Host Mode              : multi-auth
  Type dot1x State       : enabled
  Type mac State         : enabled
  Type web State         : enabled
  Type Order             : dot1x mac web
  MAC/WEB Method Order   : local radius
  Guest VLAN             : disabled
  Reauthentication       : enabled
  Max Hosts              : 100
  VLAN Assign Mode       : reject
  Common Timers
    Reauthenticate Period: 300
    Inactive Timeout     : 300
    Quiet Period         : 300
  802.1x Parameters
    EAP Max Request      : 1
    EAP TX Period        : 30
    Supplicant Timeout   : 150
    Server Timeout       : 30
  Web-auth Parameters
```

2.4.28 dot1x timeout supp-timeout

Syntax

dot1x timeout supp-timeout <1-65535>
no dot1x timeout supp-timeout

Parameter

<1-65535> Number of seconds that lapses before EAP requests are resent to the supplicant

Default

Default supplicant timeout is 30 seconds.

Mode

Interface Configuration

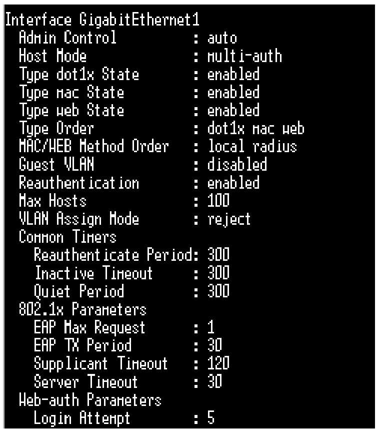
Usage

Use "**dot1x timeout supp-timeout**" command to configure the port supplicant timeout value. The supplicant timeout is the number of seconds that lapses before EAP requests are resent to the supplicant. Use **no** form of this command to restore default value.

Example

The following example shows how to configure port 802.1x supplicant timeout.

```
Switch(config)# interface GigabitEtheret
Switch(config-if)# dot1x timeout supp-timeout 120
Switch# show authentication interface GigabitEthernet 1
```



```
Interface GigabitEthernet1
  Admin Control             : auto
  Host Mode                 : multi-auth
  Type dot1x State          : enabled
  Type mac State            : enabled
  Type web State            : enabled
  Type Order                : dot1x mac web
  MAC/WEB Method Order      : local radius
  Guest VLAN                : disabled
  Reauthentication          : enabled
  Max Hosts                 : 100
  VLAN Assign Mode          : reject
  Common Timers
    Reauthenticate Period: 300
    Inactive Timeout        : 300
    Quiet Period            : 300
  802.1x Parameters
    EAP Max Request         : 1
    EAP TX Period           : 30
    Supplicant Timeout      : 120
    Server Timeout          : 30
  Web-auth Parameters
    Login Attempt           : 5
```

2.4.29 dot1x timeout tx-period

Syntax

dot1x timeout tx-period <1-65535>
no dot1x timeout tx-period

Parameter

<1-65535>	Number of seconds that the device waits for a r esponse to an Extensible Authentication Protocol (EAP) request/identity frame from the supplicant (client) before resending the request.

Default

Default EAP TX period is 30 seconds.

Mode

Interface Configuration

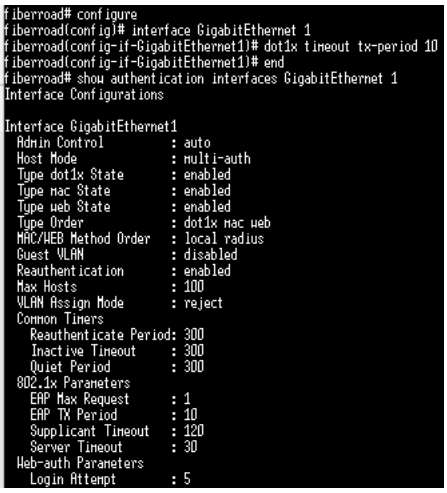
Usage

Use "**dot1x timeout tx-period**" command to configure the port 802.1x EAP TX period value. The TX period is the number of seconds that the device waits for a response to an Extensible Authentication Protocol (EAP) request/identity frame from the supplicant (client) before resending the request.
Use **no** form of this command to restore default value.

Example

The following example shows how to configure port 802.1x EAP TX period.

```
Switch(config)# interface GigabitEthernet 1
Switch(config-if)# dot1x timeout tx-period 10
Switch# show authentication interface GigabitEthernet 1
```



```
fiberroad# configure
fiberroad(config)# interface GigabitEthernet 1
fiberroad(config-if-GigabitEthernet1)# dot1x timeout tx-period 10
fiberroad(config-if-GigabitEthernet1)# end
fiberroad# show authentication interfaces GigabitEthernet 1
Interface Configurations

Interface GigabitEthernet1
  Admin Control           : auto
  Host Mode               : multi-auth
  Type dot1x State        : enabled
  Type mac State          : enabled
  Type web State          : enabled
  Type Order              : dot1x mac web
  MAC/WEB Method Order    : local radius
  Guest VLAN              : disabled
  Reauthentication        : enabled
  Max Hosts               : 100
  VLAN Assign Mode        : reject
  Common Timers
    Reauthenticate Period: 300
    Inactive Timeout      : 300
    Quiet Period          : 300
  802.1x Parameters
    EAP Max Request       : 1
    EAP TX Period         : 10
    Supplicant Timeout    : 120
    Server Timeout        : 30
  Web-auth Parameters
    Login Attempt         : 5
```

2.4.30 show authentication

Syntax

show authentication

show authentication interfaces IF_PORTS

Parameter

interfaces IF_PORTS	Specify port list to show port configurations.

Default

No default value for this command.

Mode

Privileged EXEC

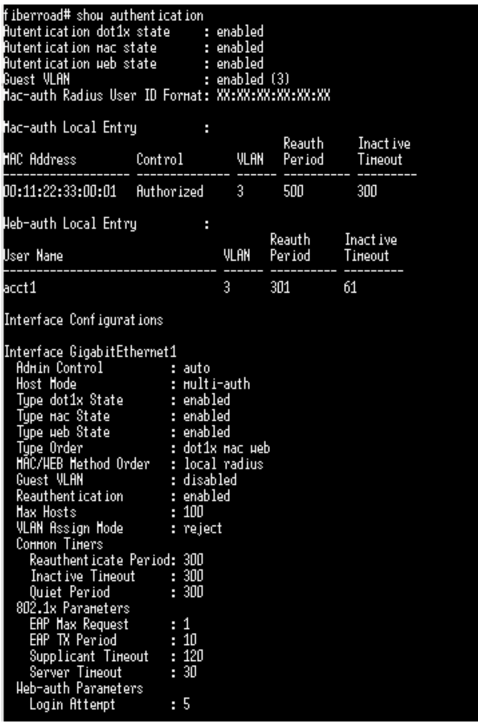
Usage

Use "**show authentication**" command to show all authentication manager configurations.

Use "**show authentication interface**" command to show authentication manager configuration of specific port.

Example

This example shows how to show the mac authentication configurations of port GigabitEthernet 1.



```
fiberroad# show authentication
Autentication dot1x state     : enabled
Autentication mac state       : enabled
Autentication web state       : enabled
Guest VLAN                    : enabled (3)
Mac-auth Radius User ID Format: XX:XX:XX:XX:XX:XX

Mac-auth Local Entry          :
                                          Reauth     Inactive
MAC Address         Control        VLAN   Period     Timeout
------------------- -------------- ------ ---------- ---------
00:11:22:33:00:01   Authorized     3      500        300

Web-auth Local Entry          :
                                        Reauth     Inactive
User Name                        VLAN   Period     Timeout
-------------------------------- ------ ---------- ---------
acct1                            3      301        61

Interface Configurations

Interface GigabitEthernet1
  Admin Control          : auto
  Host Mode              : multi-auth
  Type dot1x State       : enabled
  Type mac State         : enabled
  Type web State         : enabled
  Type Order             : dot1x mac web
  MAC/WEB Method Order   : local radius
  Guest VLAN             : disabled
  Reauthentication       : enabled
  Max Hosts              : 100
  VLAN Assign Mode       : reject
  Common Timers
    Reauthenticate Period: 300
    Inactive Timeout     : 300
    Quiet Period         : 300
  802.1x Parameters
    EAP Max Request      : 1
    EAP TX Period        : 10
    Supplicant Timeout   : 120
    Server Timeout       : 30
  Web-auth Parameters
    Login Attempt        : 5
```

2.4.31 show authentication sessions

Syntax

show authentication sessions [detail]
show authentication sessions interface IF_PORTS
show authentication sessions session-id WORD
show authentication session type (dot1x|mac|web)

Parameter

detail	Show session detail information.
interface	Show session detail information of specific
IF_PORTS	port
session-id WORD	Show session detail information of specific session id
type (dot1x|mac|web)	Show session detail information of specific authentication type

Default

No default value for this command.

Mode

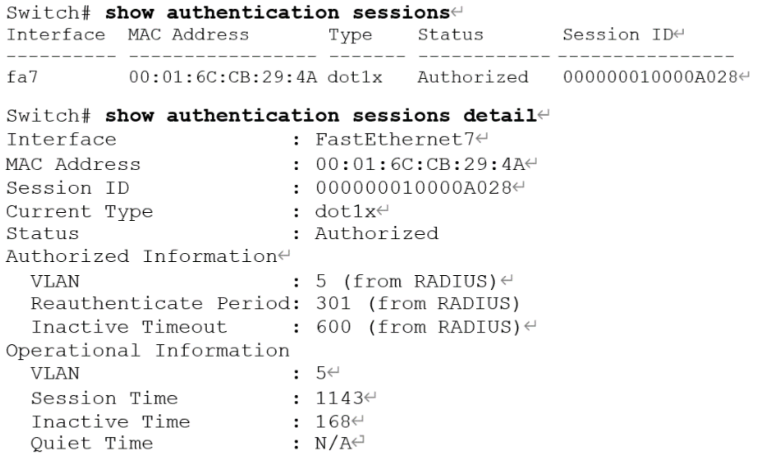
Privileged EXEC

Usage

Use "**show authentication sessions**" command to show authentication detail session information.

Example

This example shows how to show current authentication session brief and detail information.



```
Switch# show authentication sessions↵
Interface  MAC Address       Type    Status       Session ID↵
---------- ----------------- ------- ------------ ----------------
fa7        00:01:6C:CB:29:4A dot1x   Authorized   000000010000A028↵

Switch# show authentication sessions detail↵
Interface                 : FastEthernet7↵
MAC Address               : 00:01:6C:CB:29:4A↵
Session ID                : 000000010000A028↵
Current Type              : dot1x↵
Status                    : Authorized
Authorized Information↵
  VLAN                    : 5 (from RADIUS)↵
  Reauthenticate Period: 301 (from RADIUS)
  Inactive Timeout        : 600 (from RADIUS)↵
Operational Information
  VLAN                    : 5↵
  Session Time            : 1143↵
  Inactive Time           : 168↵
  Quiet Time              : N/A↵
```

2.5 Diagnostic

2.5.1 show cable-diag

Syntax **show cable-diag interfaces** IF_NMLPORTS

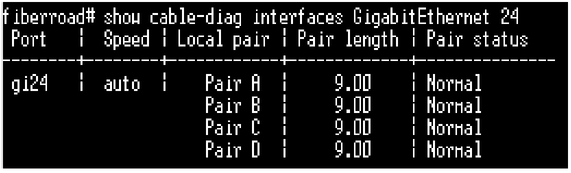
Parameter **interfaces** IF_NMLPORTS Display the cable diagnostic information of the copper media for an interface ID or a list of interfaces IDs.

Default N/A

Mode Privileged EXEC

Usage To show the estimated copper cable length attached to a specific interface, use the command **show cable-diag** in the Privilegeg EXEC mode. For the proper information of the cable length, the interface must be active and linked up.

Example The following example shows the result of cable diagnostic for the interface GigabitEthernet 24



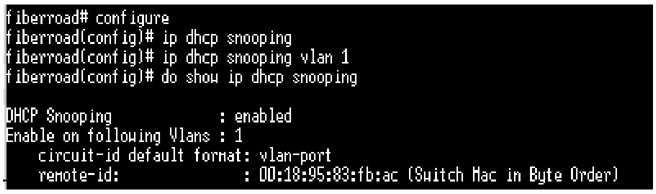
```
fiberroad# show cable-diag interfaces GigabitEthernet 24
 Port    |  Speed | Local pair | Pair length | Pair status
---------+--------+------------+-------------+--------------
 gi24    |  auto  |     Pair A |      9.00   | Normal
                        Pair B |      9.00   | Normal
                        Pair C |      9.00   | Normal
                        Pair D |      9.00   | Normal
```

2.5.2 show fiber-transceiver

Syntax	**show fiber-transceiver interfaces** IF_NMLPORTS
Parameter	**interfaces** IF_NMLPORTS Display the o diagnostic information of the fiber transceiver for an interface ID or a list of interface IDs.
Default	N/A
Mode	Privileged EXEC
Usage	To show the diagnostic information of the fiber transceiver use the command **show fiber-transceiver** in the Privilegeg EXEC mode.
Example	The following example shows the diagnostic information for the interface gi1 and gi2, where the interface fiber media ports with the transceiver inserted.

2.6 DHCP Snooping

2.6.1 ip dhcp snooping

Syntax	**ip dhcp snooping** **no ip dhcp snooping**
Parameter	N/A
Default	DHCP snooping is disabled
Mode	Global Configuration
Usage	Use the ip dhcp snooping command to enable DHCP Snooping function. Use the no form of this command to disable.
Example	The example shows how to enable DHCP Snooping on VLAN 1. You can verify settings by the following show ip dhcp snooping command. 

```
fiberroad# configure
fiberroad(config)# ip dhcp snooping
fiberroad(config)# ip dhcp snooping vlan 1
fiberroad(config)# do show ip dhcp snooping

DHCP Snooping             : enabled
Enable on following Vlans : 1
    circuit-id default format: vlan-port
    remote-id:               : 00:18:95:83:fb:ac (Switch Mac in Byte Order)
```

2.6.2 ip dhcp snooping vlan

Syntax **ip dhcp snooping vlan VLAN-LIST**

Parameter

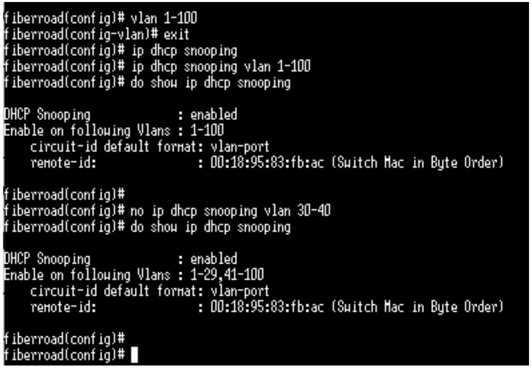
VLAN-LIST	Specify VLAN ID or a range of VLANs to enable or disable dynamic Arp inspection

Default Default is disabled on all VLANs

Mode Global Configuration

Usage Use the **ip dhcp snooping vlan** command to enable VLANs on DHCP Snooping function. Use the **no** form of this command to disable VLANs on DHCP Snooping function.

Example The example shows how to enable VLAN 1-100 on DHCP Snooping, and then disable VLAN 30-40 on DHCP Snooping. You can verify settings by the following **show ip dhcp snooping** command.



```
fiberroad(config)# vlan 1-100
fiberroad(config-vlan)# exit
fiberroad(config)# ip dhcp snooping
fiberroad(config)# ip dhcp snooping vlan 1-100
fiberroad(config)# do show ip dhcp snooping

DHCP Snooping             : enabled
Enable on following Vlans : 1-100
    circuit-id default format: vlan-port
    remote-id:                : 00:18:95:83:fb:ac (Switch Mac in Byte Order)

fiberroad(config)#
fiberroad(config)# no ip dhcp snooping vlan 30-40
fiberroad(config)# do show ip dhcp snooping

DHCP Snooping             : enabled
Enable on following Vlans : 1-29,41-100
    circuit-id default format: vlan-port
    remote-id:                : 00:18:95:83:fb:ac (Switch Mac in Byte Order)

fiberroad(config)#
fiberroad(config)#
```

2.6.3 ip dhcp snooping trust

Syntax **ip dhcp snooping /trust no ip dhcp / snooping trust**

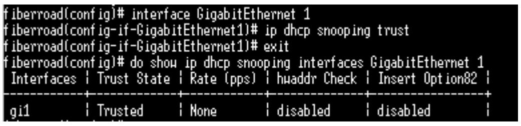
Parameter

Default DHCP snooping trust is disabled

Mode Interface Configuration

Usage Use the **ip dhcp snooping trust** command to set trusted interface. The switch does not check DHCP packets that are received on the trusted interface; it simply forwards it. Use the no form of this command to set untrusted interface.

Example The example shows how to set interface gi1 to trust. You can verify settings by the following show ip dhcp snooping interface command.



```
fiberroad(config)# interface GigabitEthernet 1
fiberroad(config-if-GigabitEthernet1)# ip dhcp snooping trust
fiberroad(config-if-GigabitEthernet1)# exit
fiberroad(config)# do show ip dhcp snooping interfaces GigabitEthernet 1
 Interfaces | Trust State | Rate (pps) | hwaddr Check | Insert Option82 |
-----------+------------+-----------+-------------+----------------+
 gi1        | Trusted     | None       | disabled      | disabled         |
```

2.6.4 ip dhcp snooping verify

Syntax

ip dhcp snooping verify mac-address
[no] ip dhcp snooping verify mac-address

Parameter

N/A

Default

DHCP snooping verify mac-address is disabled

Mode

Interface Configuration

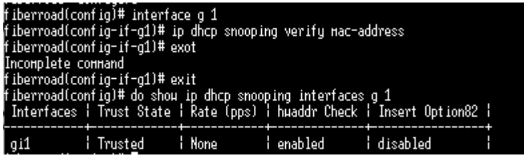
Usage

Use the **ip dhcp snooping verify** command to verify MAC address function on interface.

The “mac-address” drop DHCP packets that chaddr and ethernetsource-mac is not match.

Example

The example shows how to set interface gi1 to validate “mac-address”. You can verify settings by the following show ip dhcp snooping interface command.



```
fiberroad(config)# interface g 1
fiberroad(config-if-g1)# ip dhcp snooping verify mac-address
fiberroad(config-if-g1)# exot
Incomplete command
fiberroad(config-if-g1)# exit
fiberroad(config)# do show ip dhcp snooping interfaces g 1
 Interfaces | Trust State | Rate (pps) | hwaddr Check | Insert Option82 |
-----------+------------+-----------+-------------+----------------+
 gi1        | Trusted     | None       | enabled       | disabled         |
```

2.6.5 ip dhcp snooping rate-limit

Syntax

ip dhcp snooping rate-limit <1-300>
[no] ip dhcp snooping rate-limit

Parameter

<1-300> Set 1 to 300 PPS of DHCP packet rate limitation

Default

Default is un-limited of DHCP packet

Mode

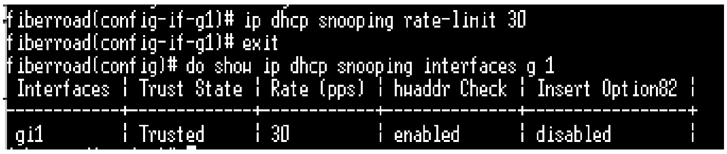
Interface Configuration

Usage

Use the ip dhcp snooping rate-limit command to set rate limitation on interface. The switch drop DHCP packets after receives more than configured rate of packets per second. Use the no form of this command to return to default settings.

Example

The example shows how to set rate limit to 30 pps on interface gi1.You can verify settings by the following **show ip dhcp snooping interface** command.



```
fiberroad(config-if-g1)# ip dhcp snooping rate-limit 30
fiberroad(config-if-g1)# exit
fiberroad(config)# do show ip dhcp snooping interfaces g 1
 Interfaces | Trust State | Rate (pps) | hwaddr Check | Insert Option82 |
------------+-------------+------------+--------------+-----------------+
 gi1        | Trusted     | 30         | enabled      | disabled        |
```

2.6.6 clear ip dhcp snooping statistics

Syntax

clear ip dhcp snooping interfaces IF_PORTS statistics

Parameter

IF_PORTS specifies ports to clear statistics

Default

No default is defined

Mode

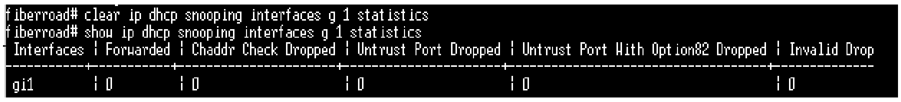
Privileged EXEC

Usage

Use the clear ip dhcp snooping interfaces statistics command to clear statistics that are recorded on interface.

Example

The example shows how to clear statistics on interface gi1. You can verify settings by the following s**how ip dhcp snooping interface statistics** command.



```
fiberroad# clear ip dhcp snooping interfaces g 1 statistics
fiberroad# show ip dhcp snooping interfaces g 1 statistics
 Interfaces | Forwarded | Chaddr Check Dropped | Untrust Port Dropped | Untrust Port With Option82 Dropped | Invalid Drop
-----------+----------+---------------------+---------------------+-----------------------------------+-------------
 gi1       | 0        | 0                   | 0                   | 0                                 | 0
```

2.6.7 show ip dhcp snooping

Syntax **show ip dhcp snooping**

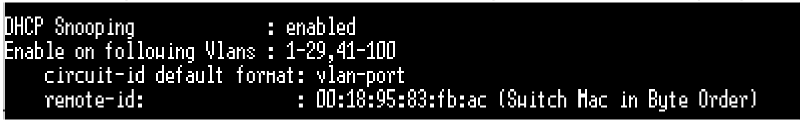
Parameter N/A

Default No default is defined

Mode Privileged EXEC

Usage Use the show **ip dhcp snooping** command to show settings of DHCP Snooping.

Example The example shows how to show settings of DHCP Snooping.



```
DHCP Snooping              : enabled
Enable on following Vlans : 1-29,41-100
    circuit-id default format: vlan-port
    remote-id:                 : 00:18:95:83:fb:ac (Switch Mac in Byte Order)
```

2.6.8 show ip dhcp snooping interface

Syntax **show ip dhcp snooping interfaces IF_PORTS**
show ip dhcp snooping interfaces IF_PORTS statistics

Parameter **IF_PORTS** specifies ports to show statistics

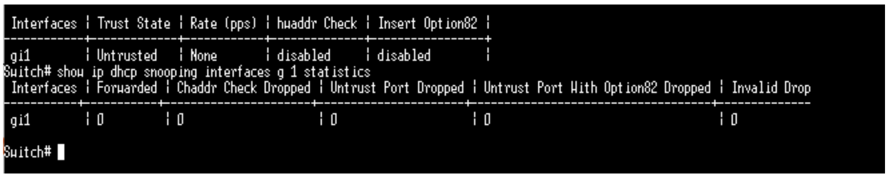
Default No default is defined

Mode Privileged EXEC

Usage Use the show ip dhcp snooping interfaces command to show settings or statistics of interface.

Example The example shows how to show settings of interface g 1.

```
switch# show ip dhcp snooping interface g 1
switch# show ip dhcp snooping interfaces gi1
        statistics
```



```
 Interfaces ¦ Trust State ¦ Rate (pps) ¦ hwaddr Check ¦ Insert Option82 ¦
-----------+------------+-----------+-------------+----------------+
 gi1        ¦ Untrusted   ¦ None       ¦ disabled     ¦ disabled        ¦
Switch# show ip dhcp snooping interfaces g 1 statistics
 Interfaces ¦ Forwarded ¦ Chaddr Check Dropped ¦ Untrust Port Dropped ¦ Untrust Port With Option82 Dropped ¦ Invalid Drop
-----------+----------+--------------------+--------------------+----------------------------------+------------
 gi1        ¦ 0         ¦ 0                    ¦ 0                    ¦ 0                                  ¦ 0

Switch# █
```

2.6.9 show ip dhcp snooping binding

Syntax

show ip dhcp snooping binding

Parameter

None

Default

No default is defined

Mode

Privileged EXEC

Usage

Use the show **ip dhcp snooping binding** command to show binding entries that learned by DHCP Snooping.

Example

The example shows how to show binding entries that learned by DHCP Snooping.

```
switch# show ip dhcp snooping binding
Bind Table: Maximun Binding Entry Number 192
  Port | VID | MAC Address    |          IP            |   Type     | Lease Time
--------+------+--------------------+------------------------------------+--------------------+----------
  fa1 | 1 | 48:5B:39:C7:12:62 | 192.168.1.100(255.255.255.255)|DHCP Snooping | 86400
```

2.6.10 ip dhcp snooping option

Syntax

ip dhcp snooping option
no ip dhcp snooping option

Parameter

None

Default

DHCP snooping option82 is disabled

Mode

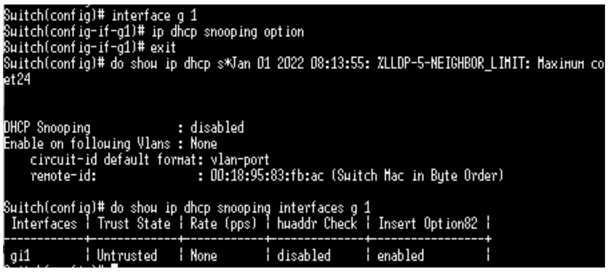
Interface Configuration

Usage

Use the ip dhcp snooping option command to enable that insert option82 content into packet. Use the no form of this command to disable.

Example

The example shows how to enable option82 insertion. You can verify settings by the following **show ip dhcp snooping interface** command.



```
Switch(config)# interface g 1
Switch(config-if-g1)# ip dhcp snooping option
Switch(config-if-g1)# exit
Switch(config)# do show ip dhcp s*Jan 01 2022 08:13:55: %LLDP-5-NEIGHBOR_LIMIT: Maximum co
et24


DHCP Snooping             : disabled
Enable on following Vlans : None
    circuit-id default format: vlan-port
    remote-id:                : 00:18:95:83:fb:ac (Switch Mac in Byte Order)

Switch(config)# do show ip dhcp snooping interfaces g 1
 Interfaces | Trust State | Rate (pps) | hwaddr Check | Insert Option82 |
------------+-------------+------------+--------------+-----------------+
 gi1        | Untrusted   | None       | disabled     | enabled         |
```

2.6.11 ip dhcp snooping option action

Syntax

ip dhcp snooping option action (drop|keep|replace)
no ip dhcp snooping option action

Parameter

Drop	Drop packets with option82 that are received from un trusted port
Keep	Keep original option82 content in packet
Replace	Replace option82 content by switch setting

Default

DHCP snooping option82 is drop

Mode

Interface Configuration

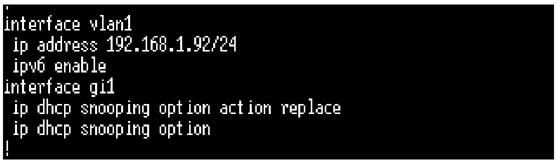
Usage

Use the **ip dhcp snooping option action** command to set the action when receive packets that with option82 content. Use the no form of this command to default setting.

Example

The example shows how to set action to replace option82 content. You can verify settings by the following **show running-config** command.

```
switch(config)# interface gi1
switch(config-if)# ip dhcp snooping option action
                   replace
```



```
!
interface vlan1
 ip address 192.168.1.92/24
 ipv6 enable
interface gi1
 ip dhcp snooping option action replace
 ip dhcp snooping option
!
```

2.6.12 ip dhcp snooping option circuit-id

Syntax

ip dhcp snooping [vlan <1-4094>] option circuit-id STRING

no ip dhcp snooping [vlan <1-4094>] option circuit-id

Parameter

Vlan <1-4094>	VLAN ID to set user defined circuit-id string
STRING	Circuit-id string, 1 to 63 ASCII characters, no spaces.

Default

Default circuit-id is port id + vlan id in byte format.

Mode

Interface Configuration

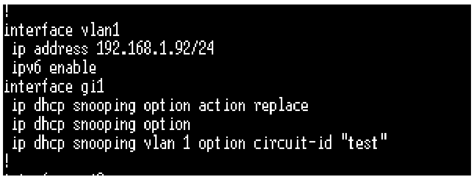
Usage

Use the **ip dhcp snooping option circuit-id** command to set user-defined circuit-id string. Circuit-id is per port per VLAN setting. If a VLAN is not found user-defined circuit-id then use per port circuit-id string. Use the **no** form of this command to default setting.

Example

The example shows how to set a user-defined circuit-id string on interface gi1 and VLAN 1. You can verify settings by the following **show running-config** command

```
switch(config)# interface gi1
switch(config-if)# ip dhcp snooping vlan 1 option
                   circuit-id test
```



```
!
interface vlan1
 ip address 192.168.1.92/24
 ipv6 enable
interface gi1
 ip dhcp snooping option action replace
 ip dhcp snooping option
 ip dhcp snooping vlan 1 option circuit-id "test"
!
```

2.6.13 ip dhcp snooping option remote-id

Syntax

ip dhcp snooping option remote-id STRING
no ip dhcp snooping option remote-id

Parameter

STRING Remote-id string, 1 to 63 ASCII characters, no spaces.

Default

Default remote-id is the switch MAC address in byte order

Mode

Global Configuration

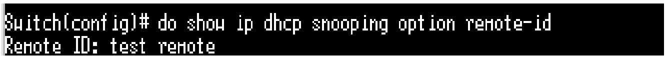
Usage

Use the **ip dhcp snooping option remote-id** command to set user-defined remote-id string.
Remote-id is a global and unique string. Use the no form of this command to default setting.

Example

The example shows how to set a user-defined remote-id string on switch. You can verify settings by the following **show ip dhcp snooping option remote- id**

```
switch(config)# ip dhcp snooping option remote-id
test_remote switch(config)# do show ip dhcp snooping
option remote-id
```



```
Switch(config)# do show ip dhcp snooping option remote-id
Remote ID: test remote
```

2.6.14 show ip dhcp snooping option

Syntax

show ip dhcp snooping option remote-id

Parameter

None

Default

No default is defined

Mode

Privileged EXEC

Usage

Use the show **ip dhcp snooping option remote-id** command to show remote-id string.

Example

The example shows how to show remote-id string

```
switch(config)# do show ip dhcp snooping option
                remote-id
```

2.6.13 ip dhcp snooping database

Syntax

ip dhcp snooping database flash
ip dhcp snooping database tftp (A.B.C.D|HOSTNAME) NAME
no ip dhcp snooping database

Parameter

(A.B.C.D|HOSTNAME)	Specify the IP address or hostname of remote TFTP server
NAME	Input name of backup file

Default

DHCP snooping database is disabled

Mode

Global Configuration

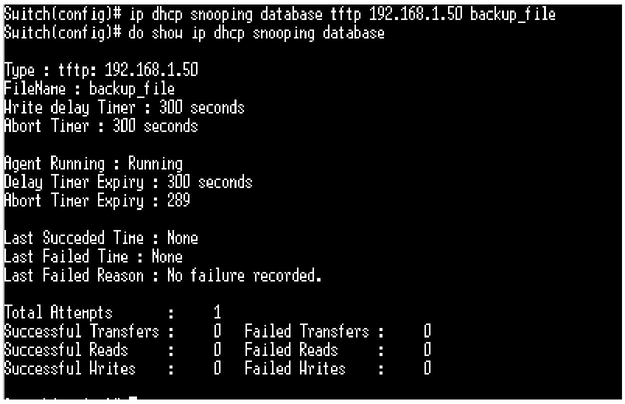
Usage

Use the **ip dhcp snooping database** command to enable DHCP Snooping database agent. The “**flash**” means that write backup file to switch local drive. The “**tftp**” means that write backup file to remote TFTP server. Use the **no** form of this command to disable.

Example

The example shows how to enable DHCP Snooping database agent and write backup file to remote TFTP server with file name “backup_file”. You can verify settings by the following s**how ip dhcp snooping database** command.

```
switch(config)# ip dhcp snooping database tftp
                192.168.1.50 backup_file
switch(config)# do show ip dhcp snooping database
```



```
Switch(config)# ip dhcp snooping database tftp 192.168.1.50 backup_file
Switch(config)# do show ip dhcp snooping database

Type : tftp: 192.168.1.50
FileName : backup_file
Write delay Timer : 300 seconds
Abort Timer : 300 seconds

Agent Running : Running
Delay Timer Expiry : 300 seconds
Abort Timer Expiry : 289

Last Succeded Time : None
Last Failed Time : None
Last Failed Reason : No failure recorded.

Total Attempts       :     1
Successful Transfers :     0   Failed Transfers :     0
Successful Reads     :     0   Failed Reads     :     0
Successful Writes    :     0   Failed Writes    :     0
```

2.6.14 ip dhcp snooping database write-delay

Syntax

ip dhcp snooping database write-delay <15-86400> no ip dhcp snooping database write-delay

Parameter

<15-86400>	Specifies the seconds of timeout. Specify the duration for which the transfer should be delayed after the binding database changes

Default

DHCP snooping database write-delay is 300 seconds

Mode

Global Configuration

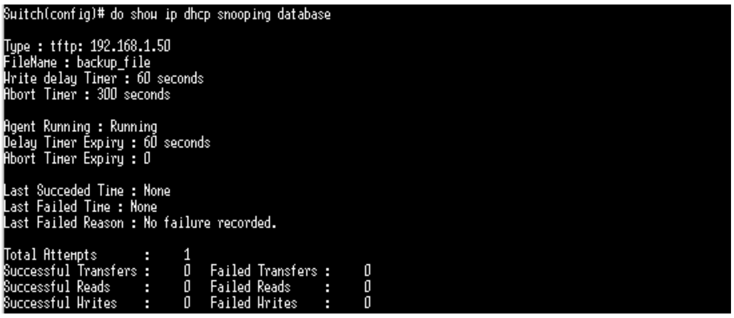
Usage

Use the **ip dhcp snooping database write-delay** command to modify the write-delay timer. Use the **no** form of this command to default setting.

Example

The example shows how to set write-delay timer to 60 seconds. You can verify settings by the following **show ip dhcp snooping database** command.

```
switch(config)# ip dhcp snooping database write-delay
60
switch(config)# do show ip dhcp snooping database
```



```
Switch(config)# do show ip dhcp snooping database

Type : tftp: 192.168.1.50
FileName : backup_file
Write delay Timer : 60 seconds
Abort Timer : 300 seconds

Agent Running : Running
Delay Timer Expiry : 60 seconds
Abort Timer Expiry : 0

Last Succeded Time : None
Last Failed Time : None
Last Failed Reason : No failure recorded.

Total Attempts       :    1
Successful Transfers :    0   Failed Transfers :    0
Successful Reads     :    0   Failed Reads     :    0
Successful Writes    :    0   Failed Writes    :    0
```

2.6.15 ip dhcp snooping database timeout

Syntax

ip dhcp snooping database timeout <0-86400>
no ip dhcp snooping database timeout

Parameter

<15-86400>	Specifies the seconds of timeout。Specify (in seconds) how long to wait for the database transfer process to finish before stopping the process. Use 0 to define an infinite duration, which means to continue trying the transfer indefinitely

Default

DHCP snooping database timeout is 300 seconds

Mode

Global Configuration

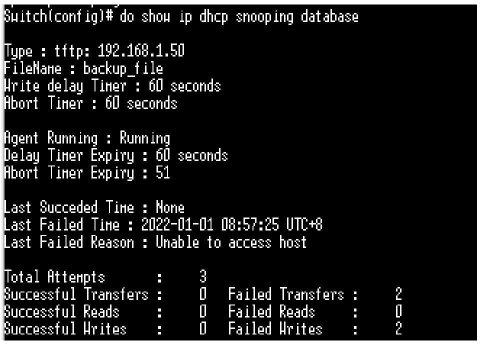
Usage

Use the ip dhcp snooping database timeout command to modify the timeout timer. Use the no form of this command to default setting.

Example

The example shows how to set timeout timer to 60 seconds. You can verify settings by the following show ip dhcp snooping database command.

```
switch(config)# ip dhcp snooping database timeout 60
switch(config)# do show ip dhcp snooping database
```



```
Switch(config)# do show ip dhcp snooping database

Type : tftp: 192.168.1.50
FileName : backup_file
Write delay Timer : 60 seconds
Abort Timer : 60 seconds

Agent Running : Running
Delay Timer Expiry : 60 seconds
Abort Timer Expiry : 51

Last Succeded Time : None
Last Failed Time : 2022-01-01 08:57:25 UTC+8
Last Failed Reason : Unable to access host

Total Attempts       :     3
Successful Transfers :     0   Failed Transfers :     2
Successful Reads     :     0   Failed Reads     :     0
Successful Writes    :     0   Failed Writes    :     2
```

2.6.16 clear ip dhcp snooping database statistics

Syntax **clear ip dhcp snooping database statistics**

Parameter None

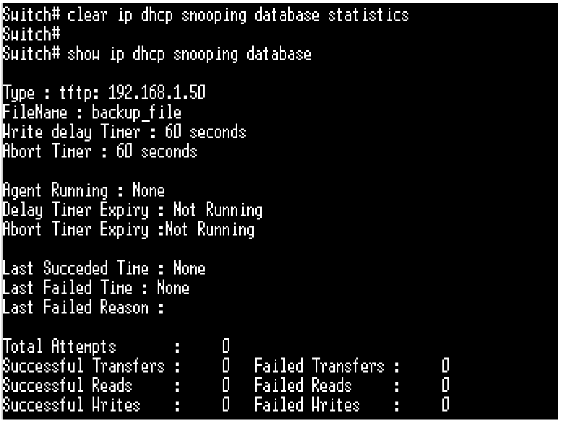
Default No default is defined

Mode Privileged EXEC

Usage Use the **clear ip dhcp snooping database statistics** command to clear statistics of DHCP Snooping databae.

Example The example shows how to clear statistics of DHCP Snooping agent. You can verify settings by the following **show ip dhcp snooping database** command.

```
switch# clear ip dhcp snooping database statistics
switch# show ip dhcp snooping database
```



```
Switch# clear ip dhcp snooping database statistics
Switch#
Switch# show ip dhcp snooping database

Type : tftp: 192.168.1.50
FileName : backup_file
Write delay Timer : 60 seconds
Abort Timer : 60 seconds

Agent Running : None
Delay Timer Expiry : Not Running
Abort Timer Expiry :Not Running

Last Succeded Time : None
Last Failed Time : None
Last Failed Reason :

Total Attempts       :    0
Successful Transfers :    0  Failed Transfers :    0
Successful Reads     :    0  Failed Reads     :    0
Successful Writes    :    0  Failed Writes    :    0
```

2.6.17 renew ip dhcp snooping database

Syntax **renew ip dhcp snooping database**

Parameter None

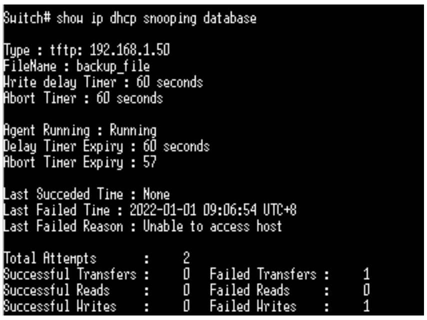
Default No default is defined

Mode Privileged EXEC

Usage Use the **renew ip dhcp snooping database** command to renew DHCP
Snooping database from backup file.

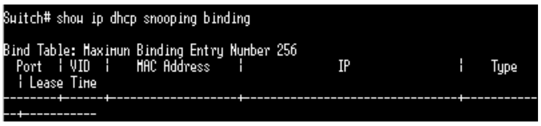
Example The example shows how to renew DHCP Snooping database. You can verify settings by the following **show ip dhcp snooping database** and s**how ip dhcp snooping binding** command.

```
switch# show ip dhcp snooping database
```



```
Switch# show ip dhcp snooping database

Type : tftp: 192.168.1.50
FileName : backup_file
Write delay Timer : 60 seconds
Abort Timer : 60 seconds

Agent Running : Running
Delay Timer Expiry : 60 seconds
Abort Timer Expiry : 57

Last Succeded Time : None
Last Failed Time : 2022-01-01 09:06:54 UTC+8
Last Failed Reason : Unable to access host

Total Attempts       :    2
Successful Transfers :    0   Failed Transfers :    1
Successful Reads     :    0   Failed Reads     :    0
Successful Writes    :    0   Failed Writes    :    1
```

```
switch# show ip dhcp snooping binding
```

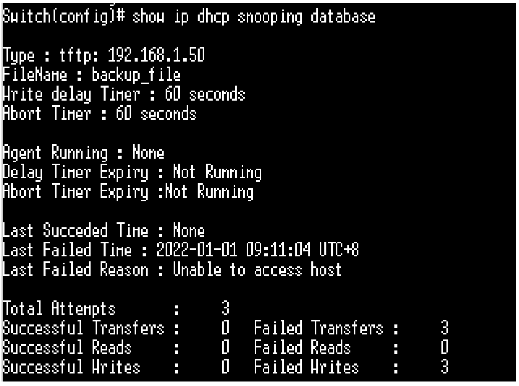


```
Switch# show ip dhcp snooping binding

Bind Table: Maximun Binding Entry Number 256
  Port  | VID  |    MAC Address    |               IP               |   Type
  | Lease Time
--------+------+-------------------+--------------------------------+----------
--+----------
```

2.6.18 show ip dhcp snooping database

Syntax	**show ip dhcp snooping database**
Parameter	None
Default	No default is defined
Mode	Privileged EXEC
Usage	Use the show ip dhcp snooping database command to show settings of DHCP Snooping agent.
Example	The example shows how to show settings of DHCP Snooping agent.

```
switch(config)# show ip dhcp snooping database
```



```
Switch(config)# show ip dhcp snooping database

Type : tftp: 192.168.1.50
FileName : backup_file
Write delay Timer : 60 seconds
Abort Timer : 60 seconds

Agent Running : None
Delay Timer Expiry : Not Running
Abort Timer Expiry :Not Running

Last Succeded Time : None
Last Failed Time : 2022-01-01 09:11:04 UTC+8
Last Failed Reason : Unable to access host

Total Attempts       :    3
Successful Transfers :    0   Failed Transfers :    3
Successful Reads     :    0   Failed Reads     :    0
Successful Writes    :    0   Failed Writes    :    3
```

2.7 DoS

2.7.1 dos

Syntax

dos (daeqsa-deny|icmp-frag-pkts-deny|icmpv4-ping-max- check|icmpv6-ping-max-check|ipv6-min-frag-size-check|land- deny|nullscan-deny|pod-deny|smurf-deny|syn-sportl1024-deny|synfin-deny|synrst-deny|tcp-frag-off-min-check|tcpblat- deny|tcphdr-min-check|udpblat-deny|xmas-deny)
dos icmp-ping-max-length MAX_LEN
dos ipv6-min-frag-size-length MIN_LEN
dos smurf-netmask MASK
dos tcphdr-min-length HDR_MIN_LEN
no dos (tcp-frag-off-min-check|synrst-deny|synfin-deny|xma- deny|nullscan-deny|syn-sportl1024-deny|tcphdr-min-check|smurf- deny|icmpv6-ping-max-check|icmpv4-ping-max-check|icmp-frag- pkts-deny|ipv6-min-frag-size-check|pod-deny|tcpblat- deny|udpblat-deny|land-deny|daeqsa-deny)

Parameter

daeqsa-deny	Drops the packets if the destination MAC address is equal to the source MAC address.
icmp-frag-pkts-deny	Drops the fragmented ICMP packets.
icmpv4-ping-max-check	Checks the maximum size of ICMP ping packets, and drops the packets larger than the maximum packet size defined by the command **dos icmp-ping-max-length** MAX_LEN.
icmpv6-ping-max-check	Checks the maximum size of ICMPv6 ping packets, and drops the packets larger than the maximum packet size defined by the command **dos icmp-ping-max- length** MAX_LEN.
ipv6-min-frag- size-check	Checks the minimum size of IPv6 fragments, and drops the packets smaller than the minimum size defined by the command dos **ipv6-min-frag-size-length** MIN_LEN.
land-deny	Drops the packets if the source IP address is equal to the destination IP address.
nullscan-deny	Drops the packets with NULL scan.
pod-deny	Avoids ping of death attack.
smurf-deny	Avoids smurf attack.
syn-sportl1024-deny	Drops SYN packets with sport less than 1024.
synfin-deny	Drops the packets with SYN and FIN bits set.
synrst-deny	Drops the packets with SYN and RST bits set.
tcp-frag-off-min-check	Drops the TCP fragment packets with offset equals to one.
tcpblat-deny	Drops the packages if the TCP source port is equal to the TCP destination port.
tcphdr-min-check	Checks the minimum TCP header and drops the TCP packets with the header smaller than the minimum size defined by the command **dos tcphdr-min-length** HDR_MIN_LEN.
udpblat-deny	Drops the packets if the UDP source port equals to the UDP destination port.

xmas-deny	Drops the packets if the sequence number is zero, and the FIN, URG and PSH bits are set.
icmp-ping-max-length MAX_LEN	Specify the maximum size of the ICMPv4/ICMPv6 ping packets. The valid range is from 0 to 65535 bytes, and the default value is 512 bytes.
ipv6-min-frag- size-length MIN_LEN	Specify the minimum size of IPv6 fragments. The valid range is from 0 to 65535 bytes, and default value is 1240 bytes.
smurf-netmask MASK	Specify the netmask of smurf attack. The length range is from 0 to 323 bytes, and default length is 0 bytes.
tcphdr-min-length HDR_MIN_LEN	Specify the minimum TCP header length. The length range is from 0 to 31 bytes, and default length is 20 bytes.

Default

All of DoS protections are enabled by default. The default parameter are:

- The maximum size of ICMP ping packages is 512 bytes
- The minimum size of IPv6 fragments is 1240 bytes.
- The Smurf netmask length is 0 bytes.
- The minimum TCP header length is 20 bytes.

Mode

Global Configuration

Usage

To enable the specific Deniel of Service (DoS) protection, use the command **dos** in the Global Configuration mode. Otherwise, use the **no** form of the command to disable the specific DoS protection.

Example

The following example sets the minimum fragment size to 1024 bytes, and enables the minimum size of IPv6 fragments validation.

```
Switch(config)# dos ipv6-min-frag-size-length 1024
Switch(config)# dos ipv6-min-frag-size-check
```

2.7.2 dos(interface)

Syntax **dos / no dos**

Parameter N/A

Default DoS protection is disabled on each interface.

Mode Interface Configuration

Usage To enable the DoS on the specific interface, use the command **dos** in the Interface Configuration mode. Otherwise, use the **no** form of the command to disable the DoS on the interface.

Example The following example enables the DoS on the interface fa1.

```
Switch(config)# interface g 1
Switch(config-if)# dos
```

2.7.3 show dos

Syntax **show dos**
show dos interface IF_PORTS

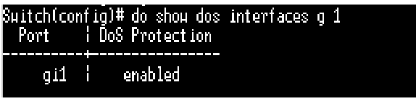
Parameter **interface** IF_PORTS An interface ID or the list of interface IDs.

Default N/A

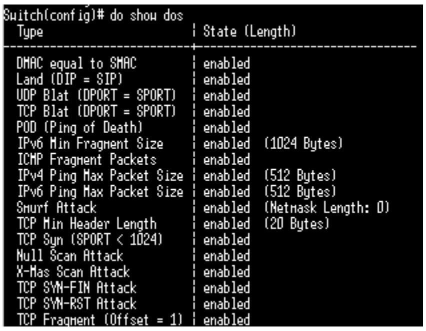
Mode Privileged EXEC

Usage To show the DoS protection configuration, use the command show dos in the Privileged EXEC mode. For the status of DoS protection on each interface, use the command show dos interface in the Priveleged EXEC mode.

Example The following example shows the global DoS protection configuration.



```
Switch(config)# do show dos interfaces g 1
  Port     | DoS Protection
-----------+-----------------
     gi1   |    enabled
```



```
Switch(config)# do show dos
  Type                        | State (Length)
------------------------------+----------------------------------
  DMAC equal to SMAC          | enabled
  Land (DIP = SIP)            | enabled
  UDP Blat (DPORT = SPORT)    | enabled
  TCP Blat (DPORT = SPORT)    | enabled
  POD (Ping of Death)         | enabled
  IPv6 Min Fragment Size      | enabled  (1024 Bytes)
  ICMP Fragment Packets       | enabled
  IPv4 Ping Max Packet Size   | enabled  (512 Bytes)
  IPv6 Ping Max Packet Size   | enabled  (512 Bytes)
  Smurf Attack                | enabled  (Netmask Length: 0)
  TCP Min Header Length       | enabled  (20 Bytes)
  TCP Syn (SPORT < 1024)      | enabled
  Null Scan Attack            | enabled
  X-Mas Scan Attack           | enabled
  TCP SYN-FIN Attack          | enabled
  TCP SYN-RST Attack          | enabled
  TCP Fragment (Offset = 1)   | enabled
```

2.8 Dynamic ARP Inspection

2.8.1 ip arp inspection

Syntax

ip arp / inspection no ip / arp inspection

Parameter

None

Default

Dynamic Arp inspection is disabled

Mode

Global Configuration

Usage

Use the **ip arp inspection** command to enable Dynamic Arp Inspection function. Use the **no** form of this command to disable.

Example

The example shows how to enable Dynamic Arp Inspection on VLAN 1. You can verify settings by the following **show ip arp inspection** command.

```
switch(config)# ip arp inspection
switch(config)# ip arp inspection vlan 1
switch(config)# show ip arp inspection
```

2.8.2 ip arp inspection vlan

Syntax

ip arp inspection vlan VLAN-LIST
no ip arp inspection vlan VLAN-LIST

Parameter

VLAN-LIST	Specify VLAN ID or a range of VLANs to enable or disable dynamic Arp inspection

Default

Default is disabled on all VLANs

Mode

Global Configuration

Usage

Use the **ip arp inspection vlan** command to enable VLANs on Dynamic Arp Inspection function. Use the **no** form of this command to disable VLANs on Dynamic Arp Inspection function.

Example

The example shows how to enable VLAN 1-100 on Dynamic Arp Inspection, and then disable VLAN 30-40 on Dynamic Arp Inspection. You can verify settings by the following **show ip arp inspection** command.

```
switch(config)# vlan 1-100
switch(config)# exit
switch(config)# ip arp inspection
switch(config)# ip arp inspection vlan 1-100
switch(config)# show ip arp inspection

switch(config)# no ip arp inspection vlan 30-40
switch(config)# show ip arp inspection
```

2.8.3 ip arp inspection trust

Syntax

ip arp inspection trust
no ip arp inspection trust

Parameter

None

Default

Dynamic Arp inspection is disabled

Mode

Interface Configuration

Usage

Use the **ip arp inspection** trust command to set trusted interface. The switch does not check ARP packets that are received on the trusted interface; it simply forwards it. Use the **no** form of this command to set untrusted interface.

Example

The example shows how to set interface gi1 to trust. You can verify settings by the following show ip arp inspection interface command.

```
switch(config)# interface g 1
switch(config)# ip arp inspection trust
switch(config)# do show ip arp inspection interface g 1
```

2.8.4 ip arp inspection validate

Syntax

ip arp inspection validate src-mac ip arp inspection validate dst-mac
ip arp inspection validate ip [allow-zeros] no ip arp inspection validate src-mac
no ip arp inspection validate dst-mac
no ip arp inspection validate ip [allow-zeros]

Parameter

None

Default

Default is disabled of all validation

Mode

Interface Configuration

Usage

Use the **ip arp inspection validate** command to enable validate function on interface. The “**src-mac**” drop ARP requests and reply packets that arp-sender-mac and ethernet- source-mac is not match. The “**dst-mac**” drops ARP reply packets that arp-target-mac and ethernet-dst-mac is not match. The “**ip**” drop ARP request and reply packets that sender-ip is invalid such as broadcast 、 multicast 、 all zero IP address and drop ARP reply packets that target-ip is invalid. The “**allow-zeros**” means won’t drop all zero IP address. Use the no form of this command to disable validation.

Example

The example shows how to set interface gi1 to validate “src-mac” 、 “dst-mac” and “ip allow zeros”. You can verify settings by the following show ip arp inspection interface command.

```
switch(config)# interface g 1
switch(config-if)# ip arp inspection validate src-mac
switch(config-if)# ip arp inspection validate dst-ma
switch(config-if)# ip arp inspection validate ip
allow-zeros switch(config)# do show ip arp inspection
interface g 1
```

2.8.4 ip arp inspection rate-limit

Syntax	**ip arp inspection rate-limit <1-50> [no] ip arp inspection rate-limit**	
Parameter	<1-50>	Set 1 to 50 PPS of DHCP packet rate limitation
Default	Default is un-limited of ARP packet	
Mode	Interface Configuration	
Usage	Use the ip arp inspection rate-limit command to set rate limitation on interface. The switch drop ARP packets after receives more than configured rate of packets per second. Use the no form of this command to return to default settings.	
Example	The example shows how to set rate limit to 30 pps on interface gi1. You can verify settings by the following show ip arp inspection interface command.	

```
switch(config)# interface g 1
switch(config)# ip arp inspection rate-limit 30
switch(config)# do show ip arp inspection interface g 1
```

2.8.5 clear ip arp inspection statistics

Syntax	**clear ip arp inspection interfaces IF_PORTS statistics**	
Parameter	IF_PORTS	specifies ports to clear statistics
Default	No default is defined	
Mode	Privileged EXEC	
Usage	Use the clear ip arp inspection interfaces statistics command to clear statistics that are recorded on interface.	

Example The example shows how to set rate limit to 30 pps on interface gi1. You can verify settings by the following show ip arp inspection interface command.

```
switch# clear ip arp inspection interfaces gi1 statistics
switch# show ip arp inspection interfaces gi1 statistics
```

2.8.6 show ip arp inspection

Syntax	**show ip dhcp snooping**
Parameter	None
Default	No default is defined
Mode	Privileged EXEC
Usage	Use the show ip arp inspection command to show settings of Dynamic Arp Inspection
Example	The example shows how to show settings of Dynamic Arp Inspection `switch(config)# show ip arp inspection`

2.8.7 show ip arp inspection interface

Syntax	**show ip arp inspection interfaces IF_PORTS** **show ip arp inspection interfaces IF_PORTS statistics**
Parameter	IF_PORTS specifies ports to show statistics
Default	No default is defined
Mode	Privileged EXEC
Usage	Use the show ip arp inspection interfaces command to show settings or statistics of interface.

Example	`switch# show ip arp inspection interface g 1`
	`switch# show ip arp inspection interfaces g 1 statistics`

2.9 GVRP

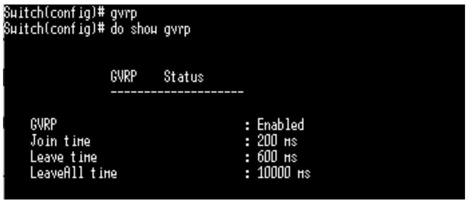
2.9.1 gvrp(Global)

Syntax	**gvrp / no gvrp**
Parameter	None
Default	GVRP is disabled
Mode	Global Configuration
Usage	Disable gvrp will clear all learned dynamic vlan entry and do not learn dynamic vlan anymore. Use '**show gvrp**' to show configuration.

Example

The following example specifies that set global gvrp test**.**

```
Switch(config)# gvrp
Switch# show gvrp
```



```
Switch(config)# gvrp
Switch(config)# do show gvrp


            GVRP    Status
            --------------------


   GVRP                          : Enabled
   Join time                     : 200 ms
   Leave time                    : 600 ms
   LeaveAll time                 : 10000 ms
```

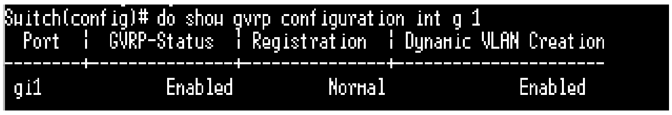
2.9.2 gvrp(Interface)

Syntax	**gvrp / no gvrp**
Parameter	None
Default	GVRP is disabled on interface
Mode	Interface mode
Usage	'no gvrp' will remove dynamic port from vlan. 'gvrp' must work at port mode is trunk.

Example

The following example specifies that set port gvrp test. The port gvrp enable must set port mode is trunk firstly.

```
Switch(config)#interface g 1
Switch(config-if)# switchport mode trunk
Switch(config-if)# gvrp
Switch# show gvrp configuration interfaces gi1
```



```
Switch(config)# do show gvrp configuration int g 1
  Port   |  GVRP-Status   | Registration   | Dynamic VLAN Creation
---------+---------------+---------------+----------------------
 gi1              Enabled          Normal              Enabled
```

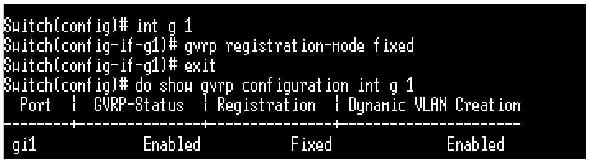
2.9.3 gvrp registration-mode

Syntax	**gvrp registration-mode (normal | fixed | forbidden)**
Parameter	**(normal | fixed | forbidden)**: **normal:** register dynamic vlan, and transmit all vlan attribute. **fixed:** do not register dynamic vlan, and only transmit static vlan attribute. **forbidden:** do not register dynamic vlan, and only transmit default vlan attribute.
Default	Default is Normal
Mode	Interface mode
Usage	When set registration-mode is fixed or forbidden, will remove the port from vlan witch is dynamic port. And do not learning vlan.

Example

The following example specifies that set gvrp registration mode test.

```
Switch(config)# interface g 1
Switch(config-if)# gvrp registration-mode fixed
Switch# show gvrp configuration interfaces g 1
```



```
Switch(config)# int g 1
Switch(config-if-g1)# gvrp registration-mode fixed
Switch(config-if-g1)# exit
Switch(config)# do show gvrp configuration int g 1
  Port   |  GVRP-Status   | Registration   | Dynamic VLAN Creation
---------+---------------+---------------+----------------------
 gi1              Enabled          Fixed               Enabled
```

2.9.4 gvrp vlan-creat-forbid

Syntax **gvrp vlan-creation-forbid**
no gvrp vlan-creation-forbid

Parameter None

Default Default is disable

Mode Interface mode

Usage 'gvrp vlan-creation-forbid' will not remove dynamic port from vlan immediate.

Example The following example specifies that set port gvrp vlan-creation-forbid test. Switch(config)#interface g 1

```
Switch(config-if)# gvrp vlan-creation-forbid
Switch(config-if)# exit
Switch# show gvrp configuration interfaces g 1
```

2.9.5 clear gvrp statistics

Syntax **clear gvrp (error-statistics | statistics) [interfaces IF_PORTS]**

Parameter

(error-statistics | statistics)	Error-statistics: error gvrp packet statistics Statistics: gvrp event message
[interfaces IF_PORTS**]**	statistics Specifies posts to clear statistics

Default none

Mode Privileged EXEC

Usage This command will clear the ports error statistics or statistics info.

Example The following example specifies that clear gvrp error statistics and statistics test.

```
Switch# clear gvrp statistics
Switch# clear gvrp error-statistics
```

2.9.6 show gvrp statistics

Syntax **show gvrp (statistics | error-statistics) [interfaces IF_PORTS]**

Parameter

none	Display all ports
(statistics|error-statistics)	statistics – GVRP statistics error-statistics GVRP error
[interfaces IF_PORTS**]**	statistics Specifies posts

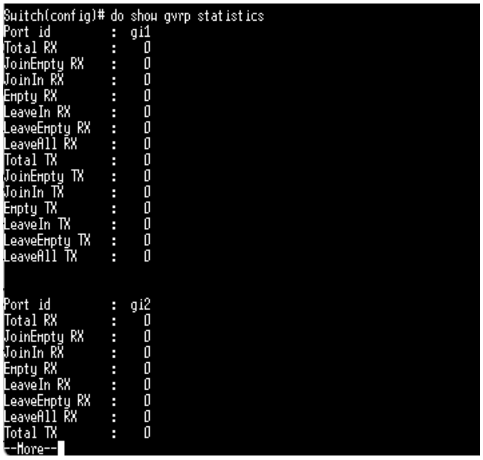
Default Display all ports statistics info

Mode Privileged EXEC

Usage This command will display the ports error statistics or statistics info.

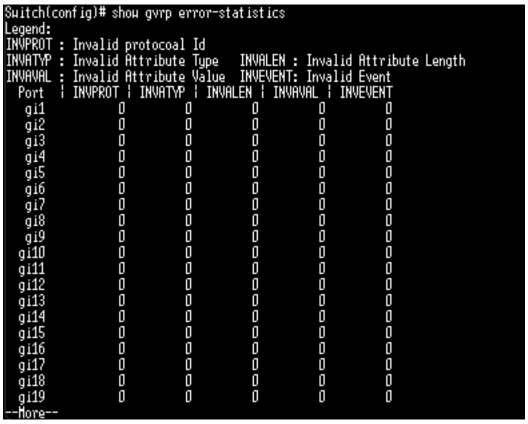
Example The following example specifies that display gvrp error statistics and statistics test.

```
Switch# show gvrp statistics
```



```
Switch(config)# do show gvrp statistics
Port id         :  gi1
Total RX        :    0
JoinEmpty RX    :    0
JoinIn RX       :    0
Empty RX        :    0
LeaveIn RX      :    0
LeaveEmpty RX   :    0
LeaveAll RX     :    0
Total TX        :    0
JoinEmpty TX    :    0
JoinIn TX       :    0
Empty TX        :    0
LeaveIn TX      :    0
LeaveEmpty TX   :    0
LeaveAll TX     :    0


Port id         :  gi2
Total RX        :    0
JoinEmpty RX    :    0
JoinIn RX       :    0
Empty RX        :    0
LeaveIn RX      :    0
LeaveEmpty RX   :    0
LeaveAll RX     :    0
Total TX        :    0
--More--
```

```
Switch# show gvrp error-statistics
```



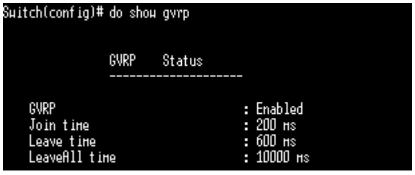
```
Switch(config)# show gvrp error-statistics
Legend:
INVPROT : Invalid protocoal Id
INVATYP : Invalid Attribute Type   INVALEN : Invalid Attribute Length
INVAVAL : Invalid Attribute Value  INVEVENT: Invalid Event
  Port  ¦ INVPROT ¦ INVATYP ¦ INVALEN ¦ INVAVAL ¦ INVEVENT
   gi1          0         0         0         0         0
   gi2          0         0         0         0         0
   gi3          0         0         0         0         0
   gi4          0         0         0         0         0
   gi5          0         0         0         0         0
   gi6          0         0         0         0         0
   gi7          0         0         0         0         0
   gi8          0         0         0         0         0
   gi9          0         0         0         0         0
  gi10          0         0         0         0         0
  gi11          0         0         0         0         0
  gi12          0         0         0         0         0
  gi13          0         0         0         0         0
  gi14          0         0         0         0         0
  gi15          0         0         0         0         0
  gi16          0         0         0         0         0
  gi17          0         0         0         0         0
  gi18          0         0         0         0         0
  gi19          0         0         0         0         0
--More--
```

2.9.7 show gvrp

Syntax	**show gvrp**
Parameter	none
Default	none
Mode	Privileged EXEC
Usage	This command will display the gvrp global info.

Example The following example specifies that display gvrp test.

```
Switch# show gvrp
```



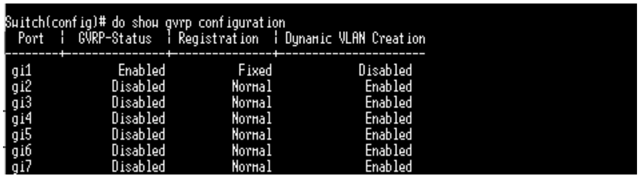
```
Switch(config)# do show gvrp


             GVRP    Status
             --------------------

   GVRP                          : Enabled
   Join time                     : 200 ms
   Leave time                    : 600 ms
   LeaveAll time                 : 10000 ms
```

2.9.8 show gvrp configuration

Syntax	**show gvrp configuration [interface IF_PORTS]**	
Parameter	**none**	Display all ports configuration
	(statistics| error-statistics)	Display Specifies posts configuration
Default	Display all ports configuration info	
Mode	Privileged EXEC	
Usage	This command will display the ports configuration info.	

Example The following example specifies that display gvrp port configuration test.

```
Switch# show gvrp configuration
```



```
Switch(config)# do show gvrp configuration
 Port  |  GVRP-Status  | Registration  | Dynamic VLAN Creation
-------+---------------+---------------+---------------------
 gi1          Enabled          Fixed              Disabled
 gi2         Disabled         Normal               Enabled
 gi3         Disabled         Normal               Enabled
 gi4         Disabled         Normal               Enabled
 gi5         Disabled         Normal               Enabled
 gi6         Disabled         Normal               Enabled
 gi7         Disabled         Normal               Enabled
```

2.10 IGMP Snooping

2.10.1 ip igmp snooping

Syntax

ip igmp
snooping no ip
igmp snooping

Parameter None

Default Default is enabled

Mode Global Configuration

Usage

Use the **ip igmp snooping** command to enable IGMP snooping function.
Use the no form of this command to disable.
You can verify settings by the **show ip igmp snooping** command.

Example

The following example specifies that set ip igmp snooping test.

```
Switch(config)# no ip igmp snooping
```

2.10.2 ip igmp snooping report-suppression

Syntax

ip igmp snooping report-suppression
no ip igmp snooping report-suppression

Parameter None

Default Default is enabled

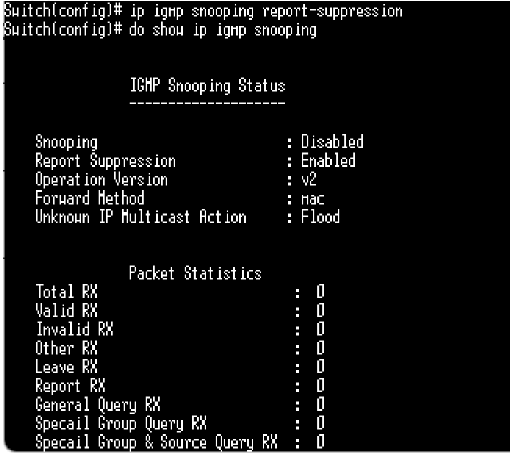
Mode Global Configuration

Usage

Use the **ip igmp snooping report-suppression** command to enable IGMP snooping report-suppression function.
Use the no form of this command to disable. Disable report-supression will forward all received reports to the vlan router ports.
You can verify settings by the **show ip igmp snooping** command.

Example

The following example specifies that disable ip igmp snooping report-suppression test.



```
Switch(config)# ip igmp snooping report-suppression
Switch(config)# do show ip igmp snooping


                IGMP Snooping Status
                --------------------

    Snooping                            : Disabled
    Report Suppression                  : Enabled
    Operation Version                   : v2
    Forward Method                      : mac
    Unknown IP Multicast Action         : Flood


                Packet Statistics
    Total RX                             :  0
    Valid RX                             :  0
    Invalid RX                           :  0
    Other RX                             :  0
    Leave RX                             :  0
    Report RX                            :  0
    General Query RX                     :  0
    Specail Group Query RX               :  0
    Specail Group & Source Query RX      :  0
```

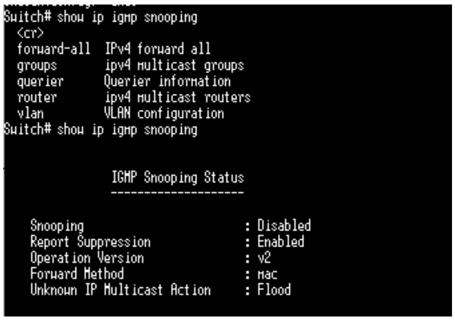
2.10.3 ip igmp snooping version

Syntax	**ip igmp snooping version (2|3)**
Parameter	(2|3) IGMP version 2 or IGMP version 3 basic mode
Default	Default is version 2
Mode	Global Configuration
Usage	Use the **ip igmp snooping** version command to change IGMP support version. Only basic mode is supported in v3. When change version from v3 to v2, all querier version will update to version 2. You can verify settings by the **show ip igmp snooping** command.

Example

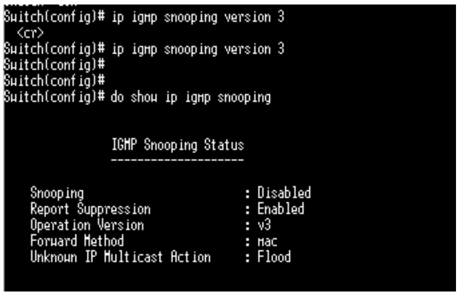
The following example specifies that set ip igmp snooping version 3.

```
Switch # ip igmp snooping
```



```
Switch# show ip igmp snooping
  <cr>
  forward-all  IPv4 forward all
  groups       ipv4 multicast groups
  querier      Querier information
  router       ipv4 multicast routers
  vlan         VLAN configuration
Switch# show ip igmp snooping


                IGMP Snooping Status
                --------------------

    Snooping                          : Disabled
    Report Suppression                : Enabled
    Operation Version                 : v2
    Forward Method                    : mac
    Unknown IP Multicast Action       : Flood
```

```
Switch(config)# ip igmp snooping version 3
```



```
Switch(config)# ip igmp snooping version 3
  <cr>
Switch(config)# ip igmp snooping version 3
Switch(config)#
Switch(config)#
Switch(config)# do show ip igmp snooping


                IGMP Snooping Status
                --------------------

    Snooping                          : Disabled
    Report Suppression                : Enabled
    Operation Version                 : v3
    Forward Method                    : mac
    Unknown IP Multicast Action       : Flood
```

2.10.4 ip igmp snooping unknown-multicast action

Syntax

ip igmp snooping unknown-multicast action (drop | flood |router-port)
no ip igmp snooping unknown-multicast action

Parameter

(drop | flood | router- port)	Drop、flood in vlan or forward to router port of unknown multicast packet

Default

Default is flood.

Mode

Global Configuration

Usage

When igmp and mld snooping disabled, it can't set action router-port. When disable igmp snooping & mld snooping, it set unknown multicast action flood. When action is router-port to flood or drop, it will delete the unknown multicast group entry.

Use the **ip igmp snooping unknown-multicast action** command to change action.
Use the **no** form of this command to restore to default.
You can verify settings by the **show ip igmp snooping** command.

Example

The following example specifies that set ip igmp unknown multicast action router-port test.

```
Switch(config)# ip igmp snooping
Switch(config)# ip igmp snooping unknown-multicast
                action router-port
```

2.10.5 ip igmp snooping querier

Syntax

ip igmp snooping vlan <VLAN-LIST> querier [version (2|3)]
no ip igmp snooping [vlan <VLAN-LIST>] querier

Parameter

VLAN-LIST	specifies VLAN ID list to set
(2|3)	Query version 2 or 3

Default

No ip igmp snooping querier by default

Mode

Global Configuration

Usage

When enable ip igmp vlan querier, there will process router select, the select successful will send general and specific query.
Use the **ip igmp snooping querier** command to add querier. Use the

no form of this command to delete querier.
You can verify settings by the show ip igmp snooping querier command.

Example **The following example specifies that set ip igmp snooping querier test.**

```
Switch(config)# ip igmp snooping vlan 2 querier version 3
```

2.10.6 ip igmp snooping vlan

Syntax **ip igmp snooping vlan VLAN-LIST**
no ip igmp snooping vlan VLAN-LIST

Parameter VLAN-LIST specifies VLAN ID list to set

Default Default is disabled for all VLANs

Mode Global Configuration

Usage Disable will clear all ip igmp snooping dynamic group and dynamic router port and make all static ip igmp group invalid of this vlan. Will not learn dynamic group and router port by igmp message any more.
Use the **ip igmp snooping vlan** command to enable IGMP on VLAN.
Use the **no** form of this command to disable
You can verify settings by the **show ip igmp snooping vlan** command.

Example The following example specifies that set ip igmp snooping vlan test.

```
Switch(config)# ip igmp snooping
Switch(config)# ip igmp snooping vlan 2
```

2.10.7 ip igmp snooping vlan fastleave

Syntax

ip igmp snooping vlan <VLAN-LIST> fastleave
no ip igmp snooping vlan <VLAN-LIST> fastleave

Parameter

VLAN-LIST	specifies VLAN ID list to set

Default

Default is disabled

Mode

Global Configuration

Usage

Use the **ip igmp snooping vlan fastleave** command to enable fastleave function. Group will remove port immediately when receive leave packet. Use the **no** form of this command to disable.
You can verify settings by the show **ip igmp snooping vlan** command

Example

The following example specifies that set ip igmp snooping vlan fastleave test.

```
Switch(config)# ip igmp snooping vlan 1 fastleave
```

2.10.8 ip igmp snooping vlan last-member-query-count

Syntax

ip igmp snooping vlan <VLAN-LIST> last-member-query-count <1-7>
no ip igmp snooping vlan <VLAN-LIST> last-member-query-count

Parameter

VLAN-LIST	specifies VLAN ID list to set
last-member-query-count <1-7>	specifies last member query count to set.

Default

Default is 2

Mode

Global Configuration

Usage

Use the **ip igmp snooping vlan last-member-query-count** command to change how many query packets will send.
Use the no form of this command to restore to default.
You can verify settings by the **show ip igmp snooping vlan** command

Example

The following example specifies that set ip igmp snooping vlan last-member-query-count test.

```
Switch(config)# ip igmp snooping vlan 1 last-member-
                query-count 5
```

2.10.9 ip igmp snooping vlan last-member-query-interval

Syntax

ip igmp snooping vlan <VLAN-LIST> last-member-query-interval <1- 60>
no ip igmp snooping vlan <VLAN-LIST> last-member-query-interval

Parameter

VLAN-LIST	specifies VLAN ID list to set
last-member-query-interval <1-60>	specifies last member query interval to set

Default

Default is 1

Mode

Global Configuration

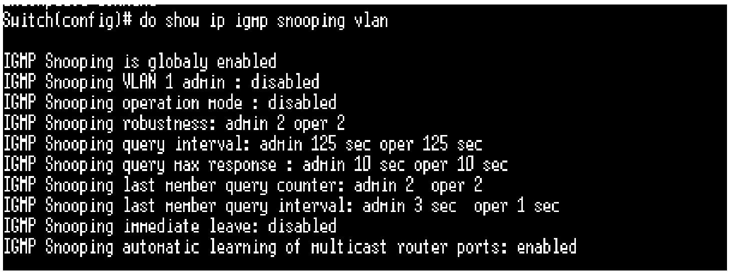
Usage

Use the ip igmp snooping vlan last-member-query-interval command to set interval between each query packet.
Use the no form of this command to restore to default.
You can verify settings by the show **ip igmp snooping vlan** command

Example

The following example specifies that set ip igmp snooping vlan last-member-query-interval test.

```
Switch(config)# ip igmp snooping vlan 1 last-member-query-interval 3
```



```
Switch(config)# do show ip igmp snooping vlan

IGMP Snooping is globaly enabled
IGMP Snooping VLAN 1 admin : disabled
IGMP Snooping operation mode : disabled
IGMP Snooping robustness: admin 2 oper 2
IGMP Snooping query interval: admin 125 sec oper 125 sec
IGMP Snooping query max response : admin 10 sec oper 10 sec
IGMP Snooping last member query counter: admin 2  oper 2
IGMP Snooping last member query interval: admin 3 sec  oper 1 sec
IGMP Snooping immediate leave: disabled
IGMP Snooping automatic learning of multicast router ports: enabled
```

2.10.10 ip igmp snooping vlan query-interval

Syntax

ip igmp snooping vlan <VLAN-LIST> query-interval <30-18000>
no ip igmp snooping vlan <VLAN-LIST> query-interval

Parameter

VLAN-LIST	specifies VLAN ID list to set
query-interval <1-18000>	specifies query interval to set

Default

Default is 125

Mode

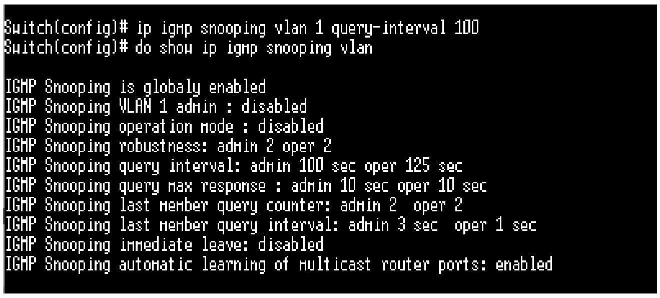
Global Configuration

Usage

Use the **ip igmp snooping vlan query-interval** command to set interval between each query.
Use the no form of this command to restore to default
You can verify settings by the show **ip igmp snooping vlan** command

Example

The following example specifies that set **ip igmp snooping vlan query-interval** test.



```
Switch(config)# ip igmp snooping vlan 1 query-interval 100
Switch(config)# do show ip igmp snooping vlan

IGMP Snooping is globaly enabled
IGMP Snooping VLAN 1 admin : disabled
IGMP Snooping operation mode : disabled
IGMP Snooping robustness: admin 2 oper 2
IGMP Snooping query interval: admin 100 sec oper 125 sec
IGMP Snooping query max response : admin 10 sec oper 10 sec
IGMP Snooping last member query counter: admin 2  oper 2
IGMP Snooping last member query interval: admin 3 sec  oper 1 sec
IGMP Snooping immediate leave: disabled
IGMP Snooping automatic learning of multicast router ports: enabled
```

2.10.11 ip igmp snooping vlan response-time

Syntax

ip igmp snooping vlan <VLAN-LIST> response-time <5-20>
no ip igmp snooping vlan <VLAN-LIST> response-time

Parameter

VLAN-LIST	specifies VLAN ID list to set
response-time <5-20>	specifies a response time to set

Default

Default is 10

Mode

Global Configuration

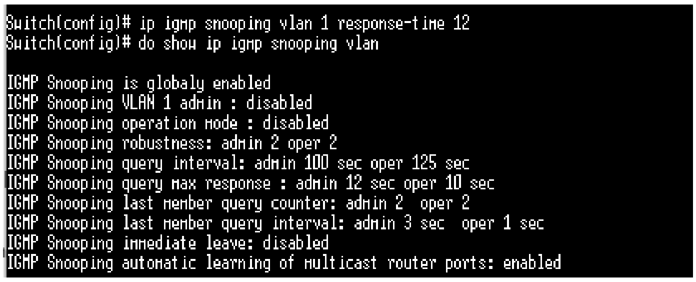
Usage

Use the **ip igmp snooping vlan response-time** command to set response time
Use the **no** form of this command to restore to default.
You can verify settings by the show **ip igmp snooping vlan** command

Example

The following example specifies that set ip igmp snooping vlan response- time test.

```
Switch(config)# ip igmp snooping vlan 1 response-time
                12
```



```
Switch(config)# ip igmp snooping vlan 1 response-time 12
Switch(config)# do show ip igmp snooping vlan

IGMP Snooping is globaly enabled
IGMP Snooping VLAN 1 admin : disabled
IGMP Snooping operation mode : disabled
IGMP Snooping robustness: admin 2 oper 2
IGMP Snooping query interval: admin 100 sec oper 125 sec
IGMP Snooping query max response : admin 12 sec oper 10 sec
IGMP Snooping last member query counter: admin 2  oper 2
IGMP Snooping last member query interval: admin 3 sec  oper 1 sec
IGMP Snooping immediate leave: disabled
IGMP Snooping automatic learning of multicast router ports: enabled
```

2.10.12 ip igmp snooping vlan robustness-variable

Syntax

ip igmp snooping vlan <VLAN-LIST> robustness-variable <1-7>
no ip igmp snooping vlan <VLAN-LIST> robustness-variable

Parameter

VLAN-LIST	specifies VLAN ID list to set
Robustness-variable<1-7>	specifies a robustness value to set

Default

Default is 2

Mode

Global Configuration

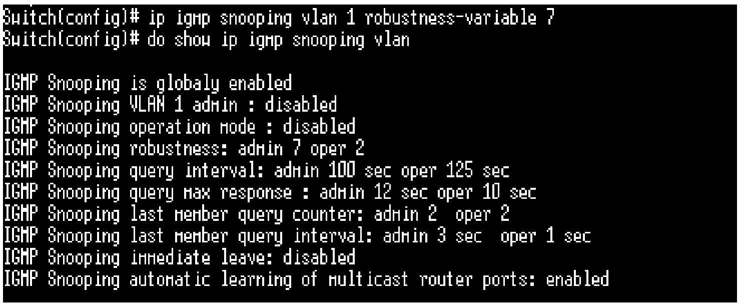
Usage

Use the **ip igmp snooping vlan robustness-variable** command to times to retry.
Use the no form of this command to restore to default
You can verify settings by the **show ip igmp snooping vlan** command

Example

The following example specifies that set ip igmp snooping vlan parameters test.

```
Switch(config)# ip igmp snooping vlan 1 robustness-variable
```



```
Switch(config)# ip igmp snooping vlan 1 robustness-variable 7
Switch(config)# do show ip igmp snooping vlan

IGMP Snooping is globaly enabled
IGMP Snooping VLAN 1 admin : disabled
IGMP Snooping operation mode : disabled
IGMP Snooping robustness: admin 7 oper 2
IGMP Snooping query interval: admin 100 sec oper 125 sec
IGMP Snooping query max response : admin 12 sec oper 10 sec
IGMP Snooping last member query counter: admin 2  oper 2
IGMP Snooping last member query interval: admin 3 sec  oper 1 sec
IGMP Snooping immediate leave: disabled
IGMP Snooping automatic learning of multicast router ports: enabled
```

2.10.13 ip igmp snooping vlan router

Syntax

ip igmp snooping vlan VLAN-LIST router learn pim-dvmrp
no ip igmp snooping vlan VLAN-LIST router learn pim-dvmrp

Parameter

VLAN-LIST	specifies VLAN ID list to set

Default

Default is enabled

Mode

Global Configuration

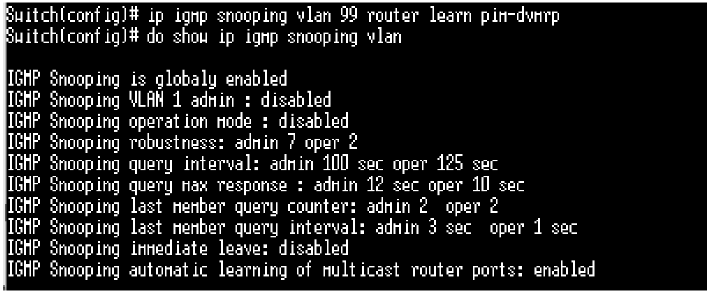
Usage

Use the **ip igmp snooping vlan router** command to enable learning router port by routing protocol packets such as PIM/PIMv2, DVMRP, MOSPF. Use the no form of this command to disable.
You can verify settings by the show **ip igmp snooping vlan** command

Example

The following example specifies that set ip igmp snooping vlan router test.

```
Switch(config)# ip igmp snooping vlan 99 router
```



```
Switch(config)# ip igmp snooping vlan 99 router learn pim-dvmrp
Switch(config)# do show ip igmp snooping vlan

IGMP Snooping is globaly enabled
IGMP Snooping VLAN 1 admin : disabled
IGMP Snooping operation mode : disabled
IGMP Snooping robustness: admin 7 oper 2
IGMP Snooping query interval: admin 100 sec oper 125 sec
IGMP Snooping query max response : admin 12 sec oper 10 sec
IGMP Snooping last member query counter: admin 2  oper 2
IGMP Snooping last member query interval: admin 3 sec  oper 1 sec
IGMP Snooping immediate leave: disabled
IGMP Snooping automatic learning of multicast router ports: enabled
```

2.10.14 ip igmp snooping vlan forbidden-port

Syntax

ip igmp snooping vlan <VLAN-LIST> forbidden-port IF_PORTS
no ip igmp snooping vlan <VLAN-LIST> forbidden-port IF_PORTS

Parameter

VLAN-LIST	specifies VLAN ID list to set
IF_PORTS	specifies a port list to set or remove

Default

No forbidden ports by default

Mode

Global Configuration

Usage

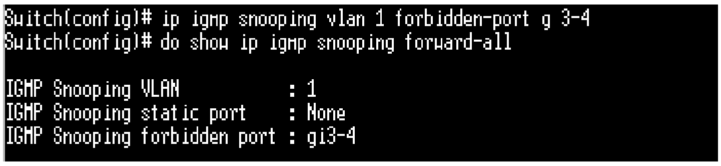
‘ip igmp snooping vlan 1 static-port gi1-2’ will add static port gi1-2 for vlan 1.the all known vlan 1 ipv4 group will add the static ports.
‘ip igmp snooping vlan 1 forbidden-port gi3-4’ will add forbidden port gi3-4 for vlan 1.the all known vlan 1 ipv4 group will remove the forbidden ports. The configure can use ‘show ip igmp snooping forward-all’.

Use the **ip igmp snooping vlan forbidden-port** command to add static non- forwarding port, all known vlan 1 ipv4 group will remove the forbidden ports. Use the no form of this command to delete forbidden port.
You can verify settings by the **show ip igmp snooping forward-all** command.

Example

The following example specifies that set ip igmp snooping static/forbidden port test.

```
Switch(config)# ip igmp snooping vlan 1 forbidden-port
                g 3-4
```



```
Switch(config)# ip igmp snooping vlan 1 forbidden-port g 3-4
Switch(config)# do show ip igmp snooping forward-all

IGMP Snooping VLAN           : 1
IGMP Snooping static port    : None
IGMP Snooping forbidden port : gi3-4
```

2.10.15 ip igmp snooping vlan static-port

Syntax

ip igmp snooping vlan <VLAN-LIST> static-port IF_PORTS
no ip igmp snooping vlan <VLAN-LIST> static-port IF_PORTS

Parameter

VLAN-LIST	specifies VLAN ID list to set
IF_PORTS	specifies a port list to set or remove

Default

No static port by default

Mode

Global Configuration

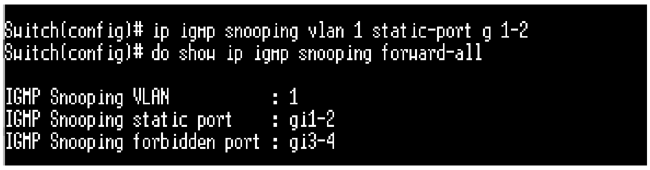
Usage

Use the **ip igmp snooping vlan static-port** command to add static forwarding port, all known vlan 1 ipv4 group will add the static ports.
Use the no form of this command to delete static port.
You can verify settings by the **show ip igmp snooping forward-all** command.

Example

The following example specifies that set ip igmp snooping static port test.

```
Switch(config)# ip igmp snooping vlan 1 static-port g
                1-2
```



```
Switch(config)# ip igmp snooping vlan 1 static-port g 1-2
Switch(config)# do show ip igmp snooping forward-all

IGMP Snooping VLAN           : 1
IGMP Snooping static port    : gi1-2
IGMP Snooping forbidden port : gi3-4
```

2.10.16 ip igmp snooping vlan forbidden-router-port

Syntax

ip igmp snooping vlan <VLAN-LIST> forbidden-router-port IF_PORTS

no ip igmp snooping vlan <VLAN-LIST> forbidden-router-port IF_PORTS

Parameter

VLAN-LIST	specifies VLAN ID list to set
IF_PORTS	specifies a port list to set or remove

Default

No forbidden router ports by default

Mode

Global Configuration

Usage

Use the **ip igmp snooping vlan forbidden-router-port** command to add static forbidden router port. This will also remove port from static router port. The forbidden router port will not forward received query packet.

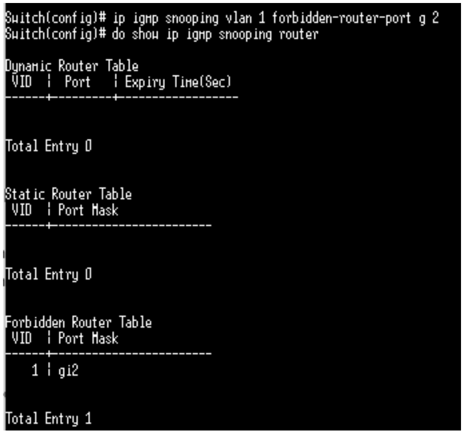
Use the no form of this command to delete forbidden router port.

You can verify settings by the **show ip igmp snooping router** command.

Example

The following example specifies that set ip igmp snooping forbidden test.

```
Switch(config)# ip igmp snooping vlan 1 forbidden-router-port g 2
```



```
Switch(config)# ip igmp snooping vlan 1 forbidden-router-port g 2
Switch(config)# do show ip igmp snooping router

Dynamic Router Table
 VID  |  Port    | Expiry Time(Sec)
------+----------+------------------


Total Entry 0


Static Router Table
 VID  | Port Mask
------+------------------------


Total Entry 0


Forbidden Router Table
 VID  | Port Mask
------+------------------------
    1 | gi2


Total Entry 1
```

2.10.17 ip igmp snooping vlan static-router-port

Syntax

ip igmp snooping vlan <VLAN-LIST> static-router-port IF_PORTS
no ip igmp snooping vlan <VLAN-LIST> static-router-port IF_PORTS

Parameter

VLAN-LIST	specifies VLAN ID list to set
IF_PORTS	specifies a port list to set or remove

Default

No static router ports by default

Mode

Global Configuration

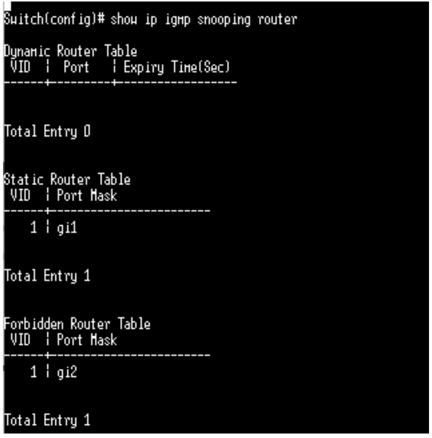
Usage

Use the **ip igmp snooping vlan static-router-port** command to add static router port. All query packets will forward to this port.
Use the **no** form of this command to delete static router port.
You can verify settings by the **show ip igmp snooping router** command.

Example

The following example specifies that set ip igmp snooping static test.

```
Switch(config)# ip igmp snooping vlan 1 static-router-port g 2
```



```
Switch(config)# show ip igmp snooping router

Dynamic Router Table
 VID  ¦  Port   ¦ Expiry Time(Sec)
------+---------+-----------------


Total Entry 0

Static Router Table
 VID  ¦ Port Mask
------+--------------------
    1 ¦ gi1

Total Entry 1

Forbidden Router Table
 VID  ¦ Port Mask
------+--------------------
    1 ¦ gi2

Total Entry 1
```

2.10.18 ip igmp snooping vlan static-group

Syntax

ip igmp snooping vlan <VLAN-LIST> static-group [<ip-addr>] interfaces IF_PORTS
no ip igmp snooping vlan <VLAN-LIST> static-group <ip-addr> interfaces IF_PORTS

Parameter

VLAN-LIST	specifies VLAN ID list to set
ip-add	specifies multicast group ipv4 address
IF_PORTS	specifies a port list to set or remove

Default

No static group by default

Mode

Global Configuration

Usage

Use the **ip igmp snooping vlan static-group** command to add a static group.
The static group will not learn other dynamic ports. If the dynamic group exists, then the static group will overlap the dynamic group. The static group set to valid unless igmp snooping global and vlan enable.

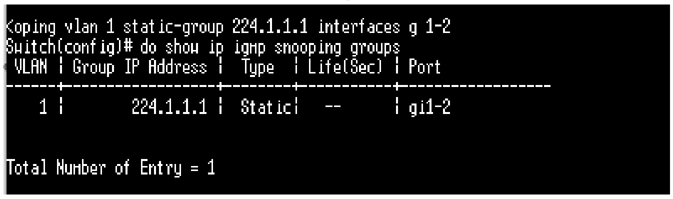
Use the no form of this command to delete a port in static group. If remove the last member of static group, the static group will be delete.

You can verify settings by the **show ip igmp snooping group** command.

Example

The following example specifies that set ip igmp snooping static group test.

```
Switch(config)# ip igmp snooping vlan 1 static-group
224.1.1.1 interfaces g 1-2
```



```
<oping vlan 1 static-group 224.1.1.1 interfaces g 1-2
Switch(config)# do show ip igmp snooping groups
 VLAN | Group IP Address |  Type  | Life(Sec) | Port
------+------------------+--------+-----------+------------------
    1 |         224.1.1.1 |  Static|   --      | gi1-2


Total Number of Entry = 1
```

2.10.19 ip igmp snooping vlan group

Syntax **no ip igmp snooping vlan <VLAN-LIST> group <ip-addr>**

Parameter

VLAN-LIST	specifies VLAN ID list to set
ip-add	specifies multicast group ipv4 address

Default None

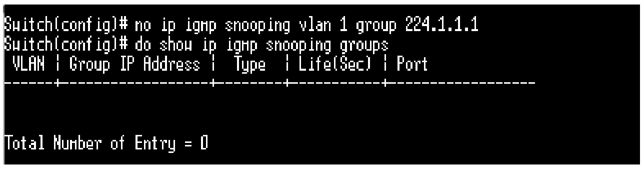
Mode Global Configuration

Usage Use the **no ip igmp snooping vlan group** command to delete a group which could be static or dynamic.

You can verify settings by the show ip igmp snooping group command.

Example The following example specifies that set ip igmp snooping static group test.

```
Switch(config)# no ip igmp snooping vlan 1 group
                224.1.1.1
```



```
Switch(config)# no ip igmp snooping vlan 1 group 224.1.1.1
Switch(config)# do show ip igmp snooping groups
 VLAN | Group IP Address |  Type  | Life(Sec) | Port
------+------------------+--------+-----------+------------------


Total Number of Entry = 0
```

2.10.20 profile range

Syntax **profile range ip <ip-addr> [ip-addr] action (permit | deny)**

Parameter

<ip-addr>	Start ipv4 multicast address
ip-add	End ipv4 multicast address
(permit | deny)	Permit: allow Multicast address range ip address learning deny: do not allow Multicast address range ip address learning

Default None

Mode igmp profile configuration mode

Usage Use the **profile** command to generate IGMP profile.

You can verify settings by the show **ip igmp profile** command

Example The following example specifies that set ip igmp profile test.

```
Switch(config)# ip igmp profile 1
Switch(config-igmp-profile)# profile range ip 224.1.1.1
                             224.1.1.8 action permit
```

2.10.21 ip igmp profile

Syntax

ip igmp profile <1-128>
no ip igmp profile <1-128>

<1-128>	specifies profile ID

Default No profie exist by default

Mode Global Configuration

Usage

Use the **ip igmp profile** command to enter profile configuration
Use the **no** form of this command to delete profile
You can verify settings by the **show ip igmp profile** command

Example The following example specifies that set ip igmp profile test.

```
Switch(config)# ip igmp profile 1
```

2.10.22 ip igmp filter

Syntax

ip igmp filter <1-128>
[no] ip igmp filter

<1-128>	specifies profile ID

Default None

Mode Port Configuration

Usage

Use the **ip igmp filter** command to bind a profile for port. When the port bind a profile. Then the port learning group will update, if the group is not match the profile rule it will remove the port from the group. Static group is excluded.
Use the **no** form of this command to delete profile
You can verify settings by the **show ip igmp filter** command

Example The following example specifies that set ip igmp filter test.

```
Switch(config)# interface gi1
Switch(config-if)#ip igmp filter 1
```

2.10.23 ip igmp max-groups

Syntax

ip igmp max-groups <0-1024>
no ip igmp max-groups

<0-1024>	The maximum number of IGMP groups that an interface can join

Default

Default is 1024

Mode

Port Configuration

Usage

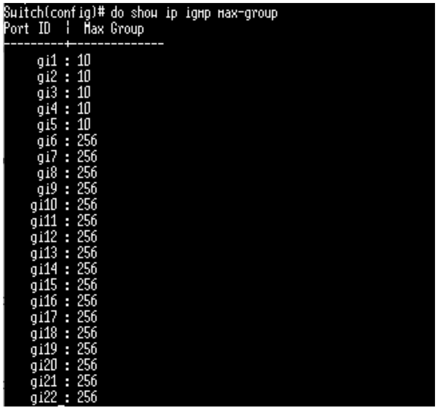
Use the **ip igmp max-groups** command to limit port learning max group number. When the port has reach limitation, new group will not add this port. Static group is excluded.

Use the no form of this command to restore to default
You can verify settings by the **show ip igmp max-groups** command.

Example

The following example specifies that set ip igmp max-groups test.

```
Switch(config-if)#ip igmp max-groups 10
```



```
Switch(config)# do show ip igmp max-group
Port ID  |  Max Group
---------+-------------
     gi1 : 10
     gi2 : 10
     gi3 : 10
     gi4 : 10
     gi5 : 10
     gi6 : 256
     gi7 : 256
     gi8 : 256
     gi9 : 256
    gi10 : 256
    gi11 : 256
    gi12 : 256
    gi13 : 256
    gi14 : 256
    gi15 : 256
    gi16 : 256
    gi17 : 256
    gi18 : 256
    gi19 : 256
    gi20 : 256
    gi21 : 256
    gi22 : 256
```

2.10.24 ip imgp max-groups action

Syntax	**ip igmp max-groups action (deny | replace)**
	(deny | replace) — Deny: current port igmp group arrived max-groups, don’t add group. Replace: current port igmp group arrived max-groups, remove port for rand group, and add port to new group.
Default	Default action is deny
Mode	Port Configuration
Usage	Use the **ip igmp max-groups action** command to set the action when the numbers of groups reach the limitation. Use the **no** form of this command to restore to default You can verify settings by the **show ip igmp max-groups** command.
Example	The following example specifies that set action replace test. `Switch(config-if)#ip igmp max-groups action replace`

2.10.25 clear ip igmp snooping groups

Syntax	**clear ip igmp snooping groups [(dynamic | static)]**
	none — Clear ip igmp groups include dynamic and static (dynamic | static) — Ip igmp group type is dynamic or static
Default	None
Mode	Privileged EXEC
Usage	This command will clear the ip igmp groups for dynamic or static or all of type. You can verify settings by the **show ip igmp snooping groups** command.

Example	The following example specifies that clear ip igmp snooping groups test.
	`Switch# clear ip igmp snooping groups`
	`Switch# show ip igmp snooping groups`

2.10.26 clear ip igmp snooping statistics

Syntax **clear ip igmp snooping statistics**

Parameter None

Default None

Mode Privileged EXEC

Usage This command will clear the igmp statistics.
You can verify settings by the **show ip igmp snooping** command.

Example The following example specifies that clear ip igmp snooping statistics test.

```
Switch# clear ip igmp snooping statistics
Switch# show ip igmp snooping
```

2.10.26 show ip igmp snooping groups counters

Syntax **show ip igmp snooping groups**

Parameter None

Default None

Mode Privileged EXEC

Usage This command will display the ip igmp group counter include static group.

Example The following example specifies that display ip igmp snooping group counter test.

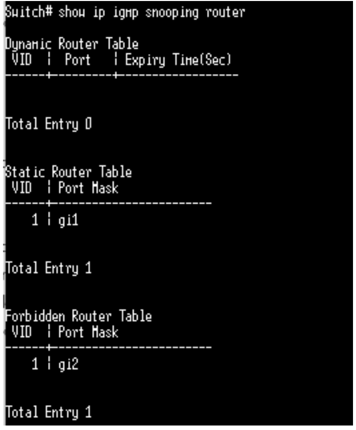
```
Switch# show ip igmp snooping group counters
```

2.10.27 show ip igmp snooping groups

Syntax	**show ip igmp snooping groups [(dynamic | static)]**	
Parameter	none	Clear ip igmp groups include dynamic and static
	(dynamic | static)	Display Ip igmp group type is dynamic or static
Default	None	
Mode	Privileged EXEC	
Usage	This command will display the ip igmp groups for dynamic or static or all of type.	
Example	The following example specifies that show ip igmp snooping groups. `Switch#` **`show ip igmp snooping groups`**	

2.10.28 show ip igmp snooping router

Syntax	**show ip igmp snooping router [(dynamic | forbidden |static)]**	
Parameter	none	Show ip igmp router include dynamic and static and forbidden
	(dynamic | forbidden | static)	Display Ip igmp router info for different type
Default	None	
Mode	Privileged EXEC	
Usage	This command will display the ip igmp router info.	
Example	The following example specifies that show ip igmp snooping router. `Switch#` **`show ip igmp snooping router`**	



```
Switch# show ip igmp snooping router

Dynamic Router Table
 VID  |  Port   | Expiry Time(Sec)
------+---------+-----------------


Total Entry 0


Static Router Table
 VID  | Port Mask
------+-----------------------
    1 | gi1


Total Entry 1


Forbidden Router Table
 VID  | Port Mask
------+-----------------------
    1 | gi2


Total Entry 1
```

2.10.29 show ip igmp snooping querier

Syntax **show ip igmp snooping querier**

Parameter

none	Show all vlan ip igmp querier info.

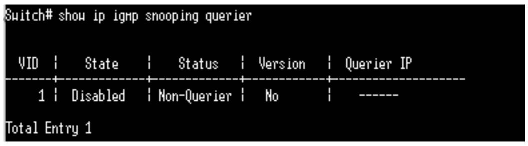
Default None

Mode Privileged EXEC

Usage This command will display all of the static vlan ip igmp querier info.

Example The following example specifies that show ip igmp snooping querier test.

Switch# **show ip igmp snooping querier**



```
Switch# show ip igmp snooping querier


 VID  |    State     |    Status    | Version    |  Querier IP
------+--------------+--------------+------------+-------------------
    1 |  Disabled    | Non-Querier  |   No       |    ------

Total Entry 1
```

2.10.30 show ip igmp snooping

Syntax **show ip igmp snooping**

Parameter None

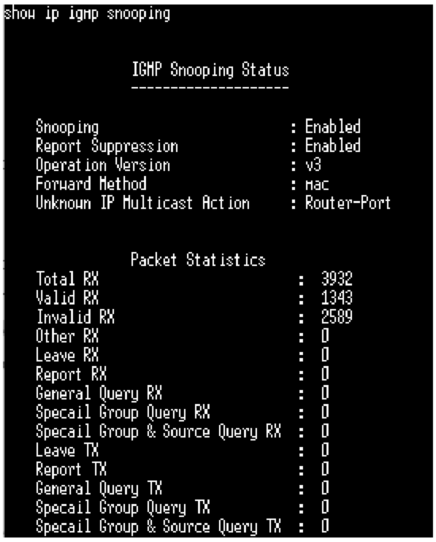
Default None

Mode Privileged EXEC

Usage This command will display ip igmp snooping global info.

Example The following example specifies that show ip igmp snooping test.

Switch# **show ip igmp snooping**



```
show ip igmp snooping


                IGMP Snooping Status
                --------------------

    Snooping                           : Enabled
    Report Suppression                 : Enabled
    Operation Version                  : v3
    Forward Method                     : mac
    Unknown IP Multicast Action        : Router-Port


                Packet Statistics
    Total RX                            :  3932
    Valid RX                            :  1343
    Invalid RX                          :  2589
    Other RX                            :  0
    Leave RX                            :  0
    Report RX                           :  0
    General Query RX                    :  0
    Specail Group Query RX              :  0
    Specail Group & Source Query RX     :  0
    Leave TX                            :  0
    Report TX                           :  0
    General Query TX                    :  0
    Specail Group Query TX              :  0
    Specail Group & Source Query TX     :  0
```

2.10.31 show ip snooping vlan

Syntax **show ip igmp snooping vlan [VLAN-LIST]**

Parameter

none	Show all ip igmp snooping vlan info
[VLAN-LIST]	Show specifies vlan ip igmp snooping info

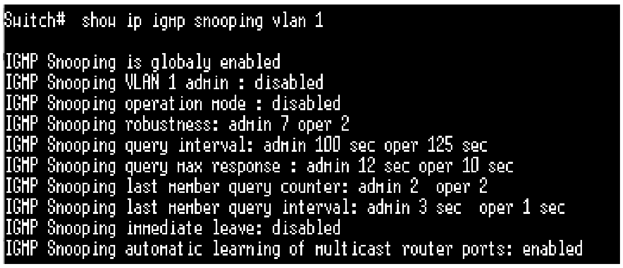
Default None

Mode Privileged EXEC

Usage This command will display ip igmp snooping vlan info.

Example The following example specifies that show ip igmp snooping vlan test.

```
Switch# show ip igmp snooping vlan 1
```



```
Switch#  show ip igmp snooping vlan 1

IGMP Snooping is globaly enabled
IGMP Snooping VLAN 1 admin : disabled
IGMP Snooping operation mode : disabled
IGMP Snooping robustness: admin 7 oper 2
IGMP Snooping query interval: admin 100 sec oper 125 sec
IGMP Snooping query max response : admin 12 sec oper 10 sec
IGMP Snooping last member query counter: admin 2  oper 2
IGMP Snooping last member query interval: admin 3 sec  oper 1 sec
IGMP Snooping immediate leave: disabled
IGMP Snooping automatic learning of multicast router ports: enabled
```

2.10.32 show ip igmp snooping forward-all

Syntax **show ip igmp snooping forward-all [vlan VLAN-LIST]**

Parameter

none	Show all ip igmp snooping vlan forward-all info
[VLAN-LIST]	Show specifies vlan of ip igmp forward info.

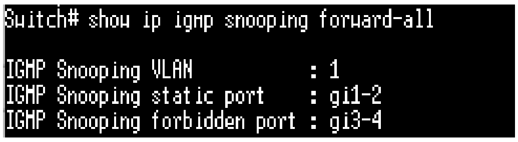
Default None

Mode Privileged EXEC

Usage This command will display ip igmp snooping forward all info.

Example The following example specifies that show ip igmp snooping forward-all test.

```
Switch# show ip igmp snooping forward-all 1
```



```
Switch# show ip igmp snooping forward-all

IGMP Snooping VLAN           : 1
IGMP Snooping static port    : gi1-2
IGMP Snooping forbidden port : gi3-4
```

2.10.33 show ip igmp profile

Syntax **show ip igmp profile [<1-128>]**

Parameter

none	Show all ip igmp snooping profile info
[1-128]	Show specifies index profile info

Default None

Mode Privileged EXEC

Usage This command will display ip igmp profile info.

Example The following example specifies that show ip igmp profile test.

```
Switch# show ip igmp profile
```

2.10.34 show ip igmp filter

Syntax **show ip igmp filter [interfaces IF_PORTS]**

Parameter

none	Show all port filter
[interfaces IF_PORTS]	Show specifies ports filter

Default None

Mode Privileged EXEC

Usage This command will display ip igmp port filter info.

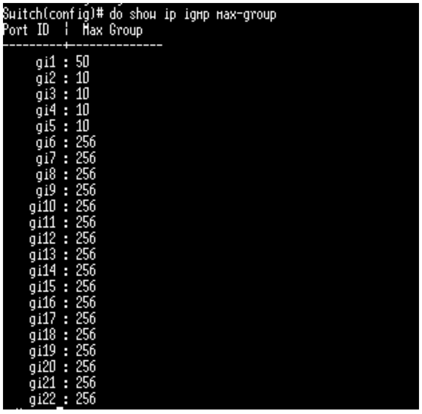
Example The following example specifies that show ip igmp filter test.

```
Switch# show ip igmp filter
```

2.10.35 show ip igmp max-group

Syntax	**show ip igmp max-group [interfaces IF_PORTS]**
Parameter	none — Show all port filter [interfaces IF_PORTS] — Show specifies ports max-group
Default	None
Mode	Privileged EXEC
Usage	This command will display ip igmp port max-group.
Example	The following example specifies that show ip igmp max-group test.

```
Switch(config-if)#ip igmp max-groups 50
Switch# show ip igmp max-group
```



```
Switch(config)# do show ip igmp max-group
Port ID  ¦  Max Group
---------+-------------
     gi1 : 50
     gi2 : 10
     gi3 : 10
     gi4 : 10
     gi5 : 10
     gi6 : 256
     gi7 : 256
     gi8 : 256
     gi9 : 256
    gi10 : 256
    gi11 : 256
    gi12 : 256
    gi13 : 256
    gi14 : 256
    gi15 : 256
    gi16 : 256
    gi17 : 256
    gi18 : 256
    gi19 : 256
    gi20 : 256
    gi21 : 256
    gi22 : 256
```

2.10.36 show ip igmp max-group action

Syntax **show ip igmp max-group action [interfaces IF_PORTS]**

Parameter

none	Show all port max-group action
[interfaces IF_PORTS]	Show specifies ports max-group action

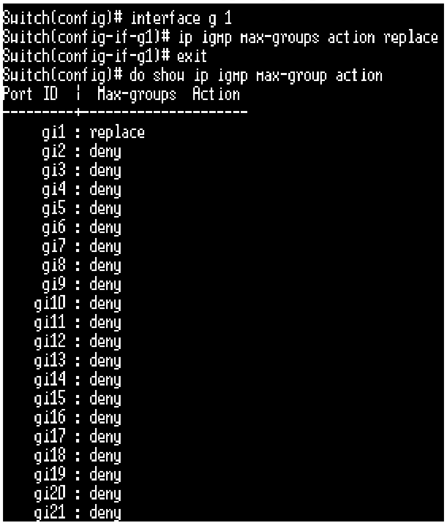
Default None

Mode Privileged EXEC

Usage This command will display ip igmp port max-group action.

Example The following example specifies that show ip igmp max-group action test.

```
Switch(config)#interface gi1
Switch(config-if)#ip igmp max-groups action replace
Switch# show ip igmp max-group action
```



```
Switch(config)# interface g 1
Switch(config-if-g1)# ip igmp max-groups action replace
Switch(config-if-g1)# exit
Switch(config)# do show ip igmp max-group action
Port ID  ¦  Max-groups  Action
---------+--------------------
     gi1 : replace
     gi2 : deny
     gi3 : deny
     gi4 : deny
     gi5 : deny
     gi6 : deny
     gi7 : deny
     gi8 : deny
     gi9 : deny
    gi10 : deny
    gi11 : deny
    gi12 : deny
    gi13 : deny
    gi14 : deny
    gi15 : deny
    gi16 : deny
    gi17 : deny
    gi18 : deny
    gi19 : deny
    gi20 : deny
    gi21 : deny
```

2.11 IP Source Guard

2.11.1 ip source verify

Syntax **ip source verify [mac-and-ip] / no ip source verify**

Parameter

mac-and-ip	Verify by mac and ip address boundle

Default IP Source Guard is disabled on interface. Default is that verifying ip address only

Mode Port Configuration

Usage Use the **ip source verify** command to enable IP Source Guard function. Default IP Source Guard filter source IP address. The “**mac-and-ip**” filters not only source IP address but also source MAC address.

Use the no form of this command to disable.

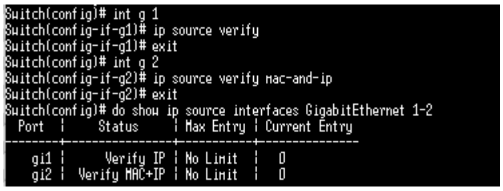
You can verify settings by the **show ip source interfaces** command.

Example The example shows how to enable IP Source Guard with source IP address filtering on interface g 1.

```
Switch(config)# interface g 1
switch(config-if)# ip source verify
```

The example shows how to enable IP Source Guard with source IP and MAC address filtering on interface g 2.

```
Switch(config)# interface g 2
switch(config-if)# ip source verify mac-and-ip
switch(config-if)# do show ip source interfaces g 1-2
```



```
Switch(config)# int g 1
Switch(config-if-g1)# ip source verify
Switch(config-if-g1)# exit
Switch(config)# int g 2
Switch(config-if-g2)# ip source verify mac-and-ip
Switch(config-if-g2)# exit
Switch(config)# do show ip source interfaces GigabitEthernet 1-2
  Port  |     Status      | Max Entry | Current Entry
--------+-----------------+-----------+--------------
    gi1 |       Verify IP | No Limit  |   0
    gi2 |  Verify MAC+IP  | No Limit  |   0
```

2.11.2 ip source binding

Syntax

ip source binding A:B:C:D:E:F vlan <1-4094> A.B.C.D interface IF_PORT

no ip source binding A:B:C:D:E:F vlan <1-4094> A.B.C.D interface IF_PORT

Parameter

A:B:C:D:E:F	Specify a MAC address of a binding entry
VLAN <1-4094>	Specify a VLAN ID of a binding entry
A.B.C.D	Specify IP address and MASK of a binding entry.
IF_PORT	Specify interface of a binding entry.

Default

Default is no binding entry.

Mode

Global Configuration

Usage

Use the ip source binding command to create a static IP source binding entry has an IP address, its associated MAC address、VLAN ID、interface.

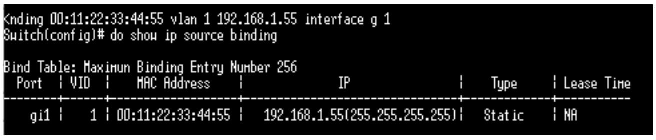
Use the no form of this command to delete static entry.

You can verify settings by the show ip source binding command.

Example

The example shows how to add a static IP source binding entry.

```
Switch(config)# ip source binding 00:11:22:33:44:55
vlan 1 192.168.1.55 interface g 1
switch(config)# do show ip source binding
```



```
<nding 00:11:22:33:44:55 vlan 1 192.168.1.55 interface g 1
Switch(config)# do show ip source binding

Bind Table: Maximun Binding Entry Number 256
  Port  | VID |    MAC Address    |               IP                |    Type    | Lease Time
--------+-----+-------------------+---------------------------------+------------+----------
    gi1 |   1 | 00:11:22:33:44:55 |  192.168.1.55(255.255.255.255)|   Static   | NA
```

2.11.3 show ip source interface

Syntax

show ip source interfaces IF_PORTS

Parameter

IF_PORTS	specifies ports to show

Default

No default is defined

Mode

Privileged EXEC

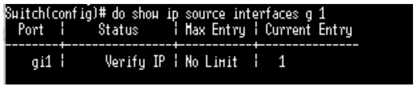
Usage

Use the **show ip source interface** command to show settings of IP Source Guard of interface

Example

The example shows how to show settings of IP Source Guard of interface g 1

```
switch# show ip source interfaces g 1
```



```
Switch(config)# do show ip source interfaces g 1
  Port  |     Status     | Max Entry | Current Entry
--------+----------------+-----------+--------------
   gi1  |      Verify IP | No Limit  |   1
```

2.11.4 show ip source binding

Syntax

show ip source binding [(dynamic|static)]

Parameter

dynamic	Show entries that added by DHCP snooping learn
static	Show entries that added by user

Default

No default is defined

Mode

Privileged EXEC

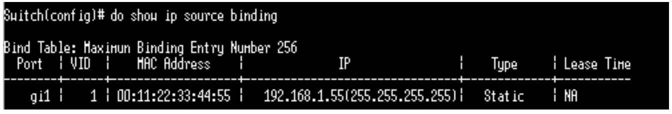
Usage

Use the show ip source binding command to show binding entries of IP Source Guard.

Example

The example shows how to show static binding entries of IP Source Guard.

```
switch# show ip source binding
```



```
Switch(config)# do show ip source binding

Bind Table: Maximun Binding Entry Number 256
  Port  | VID  |    MAC Address    |                IP                 |    Type    | Lease Time
--------+------+-------------------+-----------------------------------+------------+-----------
    gi1 |    1 | 00:11:22:33:44:55 |   192.168.1.55(255.255.255.255)|   Static    | NA
```

2.12 Link Aggregation

2.12.1 lag

Syntax **lag <1-8> mode (static | active | passive) / no lag**

Parameter

<1-8>	Specify the LAG id for the interface
static	Specify the LAG to be static mode and join the interface into this LAG.
active	Specify the LAG to be dynamic mode and join the interface into this LAG with LACP active port.
passive	Specify the LAG to be dynamic mode and join the interface into this LAG with LACP passive port.

Default There is no LAG in default.

Mode Interface Configuration

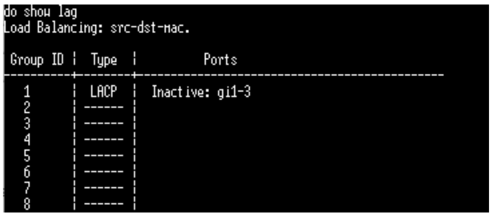
Usage Link aggregation group function allows you to aggregate multiple physical ports into one logic port to increase bandwidth. This command makes normal port join into the specific LAG logic port with static or dynamic mode. And use “no lag” to leave the LAG logic port.

Example This example shows how to create a dynamic LAG and join g1-g3 to this LAG.

```
Switch(config)# interface range fa1-3
Switch(config-if)# lag 1 mode active
```

This example shows how to show current LAG status.

```
Switch# show lag
```



```
do show lag
Load Balancing: src-dst-mac.

 Group ID |  Type  |          Ports
----------+--------+----------------------------------------
    1     |  LACP  |  Inactive: gi1-3
    2     | ------ |
    3     | ------ |
    4     | ------ |
    5     | ------ |
    6     | ------ |
    7     | ------ |
    8     | ------ |
```

2.12.2 lag load-balance

Syntax

lag load-balance (src-dst-mac | src-dst-mac-ip)
no lag load-balance

Parameter

src-dst-mac	Specify algorithm to balance traffic by using source and destination MAC address for all packets.
src-dst-mac-ip	Specify algorithm to balance traffic by using source and destination IP address for IP packets and using source and destination MAC address for non-IP packet

Default

Default load balance algorithm is src-dst-mac

Mode

Global Configuration

Usage

Link aggregation group port should transmit packets spread to all ports to balance traffic loading. There are two algorithm supported and this command allow you to select the algorithm.

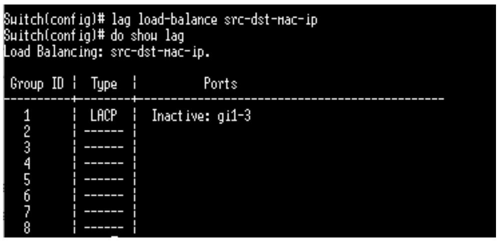
Example

This example shows how to change load balance algorithm to src-dst-mac-ip.

```
Switch(config)# lag load-balance src-dst-mac-ip
```

This example shows how to show current load balance algorithm.

```
Switch# show lag
```



```
Switch(config)# lag load-balance src-dst-mac-ip
Switch(config)# do show lag
Load Balancing: src-dst-mac-ip.

 Group ID |  Type  |           Ports
----------+--------+-------------------------------------------
   1      |  LACP  |  Inactive: gi1-3
   2      | ------ |
   3      | ------ |
   4      | ------ |
   5      | ------ |
   6      | ------ |
   7      | ------ |
   8      | ------ |
```

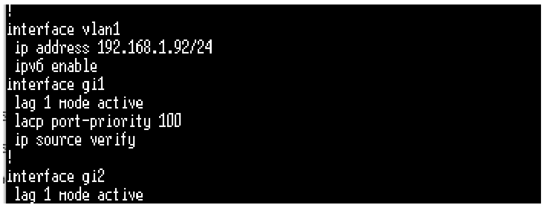
2.12.3 lacp port-priority

Syntax	**lacp port-priority <1-65535>** **no lacp port-priority**
Parameter	**<1-65535>** Specify port priority value
Default	Default port priority is 1.
Mode	Interface Configuration
Usage	LACP port priority is used for two connected DUT to select aggregation ports. Lower port priority value has higher priority. And the port with higher priority will be selected into LAG first. The only way to show this configuration is using "**show running-config**" command.

Example

This example shows how to configure interface fa1 lacp port priority to 100.

```
Switch(config)# interface g 1
Switch(config-if)# lacp port-priority 100
```



```
!
interface vlan1
 ip address 192.168.1.92/24
 ipv6 enable
interface gi1
 lag 1 mode active
 lacp port-priority 100
 ip source verify
!
interface gi2
 lag 1 mode active
```

2.12.4 lacp system-priority

Syntax

lacp system-priority <1-65535>
no lacp system-priority

Parameter

<1-65535>	Specify system priority value

Default

Default system priority is 32768.

Mode

Global Configuration

Usage

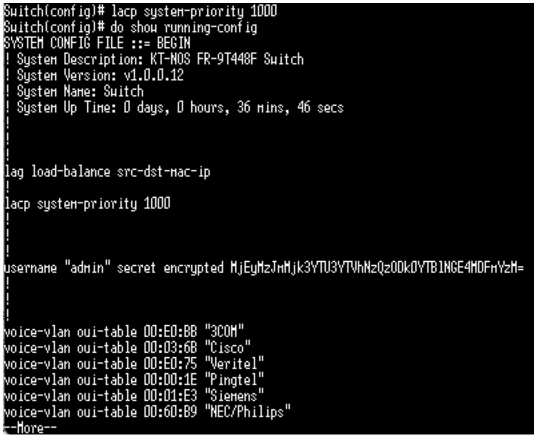
LACP system priority is used for two connected DUT to select master switch.
Lower system priority value has higher priority. And the DUT with higher priority can decide which ports are able to join the LAG.

Use "**no lacp system-priority**" to restore to the default priority value.
The only way to show this configuration is using "**show running-config**" command.

Example

This example shows how to configure lacp system priority to 1000.

```
Switch(config)# lacp system-priority 1000
```



```
Switch(config)# lacp system-priority 1000
Switch(config)# do show running-config
SYSTEM CONFIG FILE ::= BEGIN
! System Description: KT-NOS FR-9T448F Switch
! System Version: v1.0.0.12
! System Name: Switch
! System Up Time: 0 days, 0 hours, 36 mins, 46 secs
!
!
!
lag load-balance src-dst-mac-ip
!
lacp system-priority 1000
!
!
!
username "admin" secret encrypted MjEyMzJmMjk3YTU3YTVhNzQzODk0YTB1NGE4MDFmYzM=
!
!
!
voice-vlan oui-table 00:E0:BB "3COM"
voice-vlan oui-table 00:03:6B "Cisco"
voice-vlan oui-table 00:E0:75 "Veritel"
voice-vlan oui-table 00:D0:1E "Pingtel"
voice-vlan oui-table 00:01:E3 "Siemens"
voice-vlan oui-table 00:60:B9 "NEC/Philips"
--More--
```

2.12.5 lacp timeout

Syntax

lacp timeout (long | short)
no lacp timeout

Parameter

Long	Send LACP packet every 30 seconds.
Short	Send LACP packet every 1 second.

Default

Default LACP timeout is long.

Mode

Interface Configuration

Usage

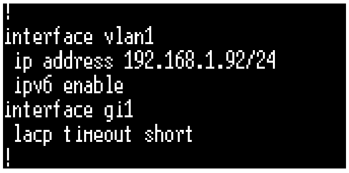
LACP need to send LACP packet to partner switch to check the link status. This command configure the interval of sending LACP packets.

The only way to show this configuration is using “**show running-config**” command.

Example

This example shows how to configure interface fa1 lacp timeout to short.

```
Switch(config)# interface g 1
Switch(config-if)# lacp timeout short
```



```
!
interface vlan1
 ip address 192.168.1.92/24
 ipv6 enable
interface gi1
 lacp timeout short
!
```

2.12.6 show lacp

Syntax

show lacp sys-id
show lacp [<1-8>] **counters**
show lacp [<1-8>] **(internal | neighbor) [detail]**

Parameter

Default

No default values for this command.

Mode

Privileged EXEC

Usage

Use "**show lacp sys-id**" command to displays the system identifier that is being used by LACP. The system identifier is made up of the LAPC system priority and the switch MAC address.

Use "**show lacp counter**" command to display LACP statistic information. Use "**show lacp internal**" command to display local information.
Use "**show lacp neighbor**" command to display remote information.

State of the specific port. These are the allowed values:

- -—Port is in an unknown state.
- **bndl**—Port is attached to an aggregator and bundled with other ports.
- **susp**—Port is in a suspended state; it is not attached to any aggregator.
- **hot-sby**—Port is in a hot-standby state.
- **1indiv**—Port is incapable of bundling with any other port.
- **1indep**—Port is in an independent state (not bundled but able to switch data traffic. In this case, LACP is not running on the partner port).
- **down**—Port is down.

State variables for the port, encoded as individual bits within a single octet with these meanings:

- bit0—LACP_Activity
- bit1—LACP_Timeout
- bit2—Aggregation
- bit3—Synchronization
- bit4—Collecting
- bit5—Distributing
- bit6—Defaulted
- bit7—Expired

Example **This example shows how to show LACP statistics.**

```
Switch# show lacp counters
Switch# show lacp internal
Switch# show lacp neighbor
```

2.12.7 show lag

Syntax **show lag**

Parameter

Default No default values for this command.

Mode Privileged EXEC

Usage Use “**show lag**” command to show current LAG load balance algorithm and members active/inactive status.

Example **This example shows how to show current LAG status.**

```
Switch# show lag
```

2.13 LLDP

2.13.1 clear lldp statistics

Syntax **clear lldp statistics**

Parameter N/A

Default There is no default configuration for this command

Mode Privileged EXEC

Usage Use “**clear lldp statistics**” command to clear the LLDP RX/TX statistics.

Example This example shows how to clear LLDP statistics.

```
Switch# clear lldp statistics
```

2.13.2 lldp

Syntax

lldp
no lldp

Parameter N/A

Default Default is enabled

Mode Global Configuration

Usage

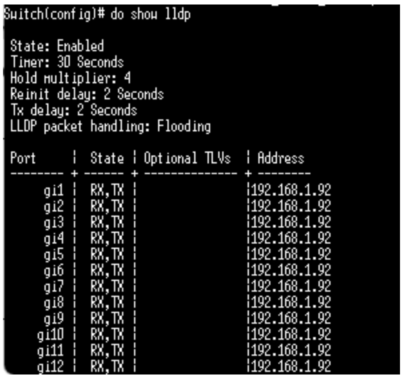
Use “**lldp**” command to enable LLDP RX/TX ability. The LLDP enable status is displayed by “**show lldp**” command.

Use the no form of this command to disable the LLDP. When LLDP is disabled, the behavior of receiving LLDP PDU would be decided by “**lldp lldpdu**” command.

Example

The following example sets LLDP enable/disable.

```
Switch (config)# lldp
Switch# show lldp
```

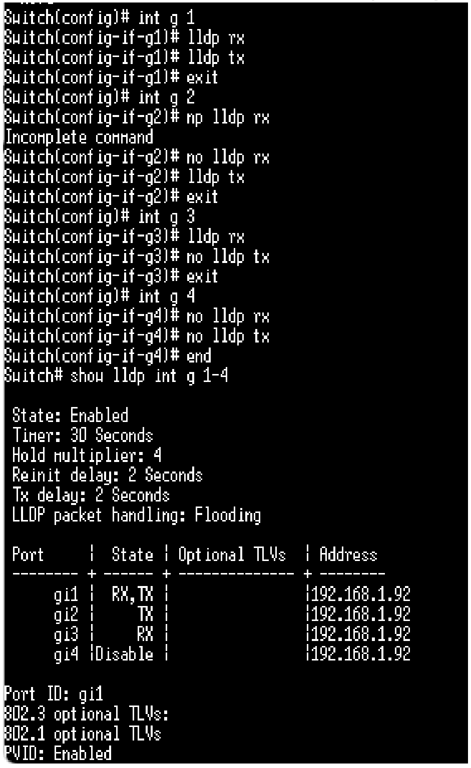


```
Switch(config)# do show lldp

 State: Enabled
 Timer: 30 Seconds
 Hold multiplier: 4
 Reinit delay: 2 Seconds
 Tx delay: 2 Seconds
 LLDP packet handling: Flooding

 Port     |  State | Optional TLVs  | Address
 -------- + ------ + -------------- + --------
      gi1 |  RX,TX |                |192.168.1.92
      gi2 |  RX,TX |                |192.168.1.92
      gi3 |  RX,TX |                |192.168.1.92
      gi4 |  RX,TX |                |192.168.1.92
      gi5 |  RX,TX |                |192.168.1.92
      gi6 |  RX,TX |                |192.168.1.92
      gi7 |  RX,TX |                |192.168.1.92
      gi8 |  RX,TX |                |192.168.1.92
      gi9 |  RX,TX |                |192.168.1.92
     gi10 |  RX,TX |                |192.168.1.92
     gi11 |  RX,TX |                |192.168.1.92
     gi12 |  RX,TX |                |192.168.1.92
```

2.13.3 lldp rx

Syntax	**lldp rx** **no lldp rx**
Parameter	N/A
Default	Default is enabled
Mode	Port Configuration
Usage	Use “**lldp rx**” command to enable the LLDP PDU RX ability. The configuration could be shown by “**show lldp**” command.

Example This example sets port gi1 to enable LLDP TX, port g 2 to disable RX but enable TX, port g 3 to enable RX but disable TX, port g 4 to disable RX and TX.



```
Switch(config)# int g 1
Switch(config-if-g1)# lldp rx
Switch(config-if-g1)# lldp tx
Switch(config-if-g1)# exit
Switch(config)# int g 2
Switch(config-if-g2)# np lldp rx
Incomplete command
Switch(config-if-g2)# no lldp rx
Switch(config-if-g2)# lldp tx
Switch(config-if-g2)# exit
Switch(config)# int g 3
Switch(config-if-g3)# lldp rx
Switch(config-if-g3)# no lldp tx
Switch(config-if-g3)# exit
Switch(config)# int g 4
Switch(config-if-g4)# no lldp rx
Switch(config-if-g4)# no lldp tx
Switch(config-if-g4)# end
Switch# show lldp int g 1-4

 State: Enabled
 Timer: 30 Seconds
 Hold multiplier: 4
 Reinit delay: 2 Seconds
 Tx delay: 2 Seconds
 LLDP packet handling: Flooding

 Port     ¦  State ¦ Optional TLVs  ¦ Address
 -------- + ------ + -------------- + --------
      gi1 ¦  RX,TX ¦                ¦192.168.1.92
      gi2 ¦     TX ¦                ¦192.168.1.92
      gi3 ¦     RX ¦                ¦192.168.1.92
      gi4 ¦Disable ¦                ¦192.168.1.92

Port ID: gi1
802.3 optional TLVs:
802.1 optional TLVs
PVID: Enabled
```

2.13.4 lldp tx-interval

Syntax

lldp tx-interval <5-32768>
no lldp tx-interval

Parameter

<5-32768> Specify the LLDP PDU TX interval in unit of second.

Default

Default TX interval is 30 seconds

Mode

Global Configuration

Usage

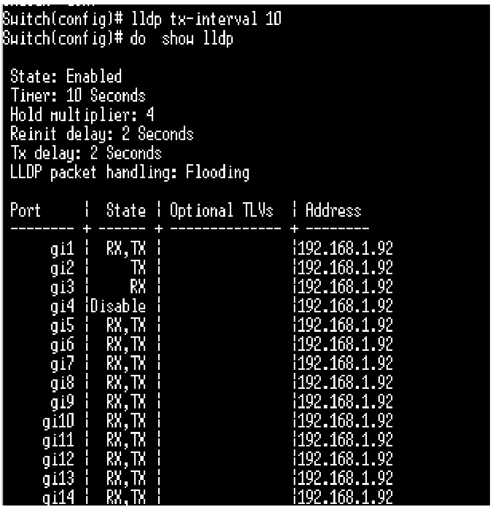
Use "**lldp tx-interval**" command to configure the LLDP TX interval. It should be noticed that both "**lldp tx-interval**" and "**lldp tx-delay**" affects the LLDP PDU TX time. The larger value of the two configurations decides the TX interval. The configuration could be shown by "**show lldp**" command.

Use the **no** form of this command to restore the interval to default value.

Example

This example sets LLDP TX interval to 10 seconds.

```
Switch(config)# lldp tx-interval 10
Switch# show lldp
```



```
Switch(config)# lldp tx-interval 10
Switch(config)# do  show lldp

 State: Enabled
 Timer: 10 Seconds
 Hold multiplier: 4
 Reinit delay: 2 Seconds
 Tx delay: 2 Seconds
 LLDP packet handling: Flooding

 Port     ¦  State ¦ Optional TLVs  ¦ Address
 -------- + ------ + -------------- + --------
      gi1 ¦  RX,TX ¦                ¦192.168.1.92
      gi2 ¦     TX ¦                ¦192.168.1.92
      gi3 ¦     RX ¦                ¦192.168.1.92
      gi4 ¦Disable ¦                ¦192.168.1.92
      gi5 ¦  RX,TX ¦                ¦192.168.1.92
      gi6 ¦  RX,TX ¦                ¦192.168.1.92
      gi7 ¦  RX,TX ¦                ¦192.168.1.92
      gi8 ¦  RX,TX ¦                ¦192.168.1.92
      gi9 ¦  RX,TX ¦                ¦192.168.1.92
     gi10 ¦  RX,TX ¦                ¦192.168.1.92
     gi11 ¦  RX,TX ¦                ¦192.168.1.92
     gi12 ¦  RX,TX ¦                ¦192.168.1.92
     gi13 ¦  RX,TX ¦                ¦192.168.1.92
     gi14 ¦  RX,TX ¦                ¦192.168.1.92
```

2.13.5 lldp reinit-delay

Syntax

lldp reinit-delay <1-10>
no lldp reinit-delay

Parameter

<1-10> Specify the LLDP re-initial delay time in unit of second.

Default

Default reinital delay is 2 seconds

Mode

Global Configuration

Usage

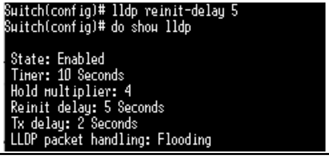
Use "**lldp reinit-delay**" to configure the LLDP re-initial delay. This delay avoids LLDP generate too many PDU if the port is up and down frequently. The delay starts to count when the port links down. The port would not generate LLDP PDU until the delay counts to zero. The configuration could be shown by "show lldp" command.

Use the **no** form of this command to restore the delay to default value.

Example

This example sets LLDP re-initial delay to 5 seconds.

```
Switch(config)# lldp reinit-delay 5
Switch# show lldp
```



```
Switch(config)# lldp reinit-delay 5
Switch(config)# do show lldp

 State: Enabled
 Timer: 10 Seconds
 Hold multiplier: 4
 Reinit delay: 5 Seconds
 Tx delay: 2 Seconds
 LLDP packet handling: Flooding
```

2.13.6 lldp holdtime-multiplier

Syntax

lldp holdtime-multiplier <2-10>
no holdtime-multiplier

Parameter

<2-10> Specify the LLDP hold time multiplier.

Default

lldp holdtime-multiplier 4

Mode

Global Configuration

Usage

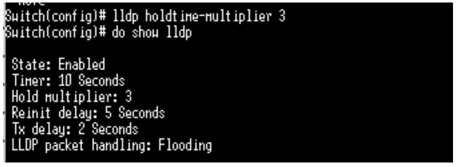
Use “lldp holdtime-multiplier” command to configure the LLDP PDU hold multiplier that decides time-to-live (TTL) value sent in LLDP advertisements: TTL = (tx-interval * holdtime-multiplier). The configuration could be shown by “show lldp” command.

Use the no form of this command to restore the multiplier to default value.

Example

This example sets LLDP hold time multiplier to 3.

```
Switch(config)# lldp holdtime-multiplier 3
Switch# show lldp
```



```
Switch(config)# lldp holdtime-multiplier 3
Switch(config)# do show lldp

 State: Enabled
 Timer: 10 Seconds
 Hold multiplier: 3
 Reinit delay: 5 Seconds
 Tx delay: 2 Seconds
 LLDP packet handling: Flooding
```

2.13.7 lldp lldpdu

Syntax **lldp lldpdu (filtering|flooding|bridging)**

Parameter

Bridging	When LLDP is globally disabled, LLDP packets are bridging (bridging LLDP PDU to VLAN member ports).
filtering	When LLDP is globally disabled, LLDP packets are filtered (deleted).
flooding	When LLDP is globally disable, LLDP packets are flooded(forward to all interfaces)

Default Default LLDP PDU handling behavior when LLDP disabled is flooding

Mode Global Configuration

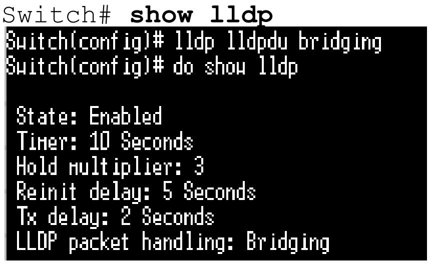
Usage Use "**lldp lldpdu**" command to configure the LLDP PDU handling behavior when LLDP is globally disabled. It should be noticed that if LLDP is globally enabled and per port LLDP RX status is configured to disabled, the received LLDP PDU would be dropped instead of taking the global disable behavior.

The configuration could be shown by "**show lldp**" command.

Use the **no** form of this command to restore the behavior to default.

Example This example sets LLDP disable action to bridging.

```
Switch(config)# lldp lldpdu bridging
Switch# show lldp
```



```
Switch(config)# lldp lldpdu bridging
Switch(config)# do show lldp

 State: Enabled
 Timer: 10 Seconds
 Hold multiplier: 3
 Reinit delay: 5 Seconds
 Tx delay: 2 Seconds
 LLDP packet handling: Bridging
```

2.13.8 lldp med

Syntax **lldp med**
no lldp med

Parameter N/A

Default lldp med

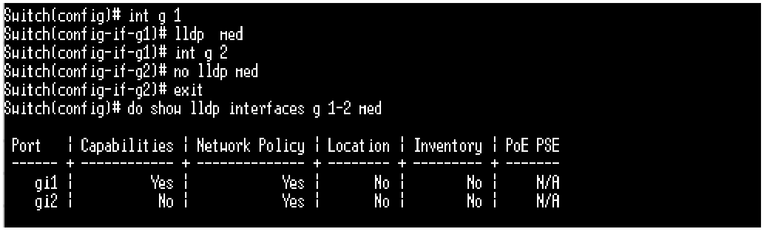
Mode Port Configuration

Usage Use "lldp med" to configure the LLDP MED enable status. If LLDP MEDis enabled, LLDP MED capability TLV and other selected MED TLV would be attached. The configuration could be shown by "show lldp med" command.

Use the no form of this command to disable the LLDP MED status.

Example This example sets port gi1 to enable LLDP MED, port gi2 to disable LLDP MED.

```
Switch(config)# interface g 1
Switch(config-if)# lldp med
Switch(config)# interface g 2
Switch(config-if)# no lldp med
Switch# show lldp interfaces g 1-2 med
```



```
Switch(config)# int g 1
Switch(config-if-g1)# lldp  med
Switch(config-if-g1)# int g 2
Switch(config-if-g2)# no lldp med
Switch(config-if-g2)# exit
Switch(config)# do show lldp interfaces g 1-2 med

 Port   | Capabilities | Network Policy | Location | Inventory | PoE PSE
 ------ + ------------ + -------------- + -------- + --------- + -------
    gi1 |          Yes |            Yes |       No |        No |     N/A
    gi2 |           No |            Yes |       No |        No |     N/A
```

2.13.9 lldp med fast-start-repeat-count

Syntax

lldp med fast-start-repeat-count <1-10>
no lldp med fast-start-repeat-count

Parameter

<1-10> LLDP PDU fast start TX repeat counts.

Default

Default fast start TX repeat count is 3

Mode

Global Configuration

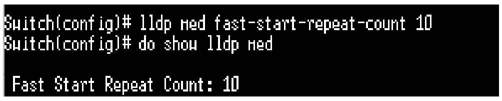
Usage

Use "lldp med fast-start-repeat-count" command to configure the LLDP PDU fast start TX repeat count. When port links up, it will send LLDP PDU immediately to notify link partner. The number of LLDP PDU sends when it links up depends on fast-start-repeat-count configuration. The LLDP PDU fast-start transmits in interval of one second. The fast start behavior works no matter LLDP MED is enabled or not. The configuration could be shown by "**show lldp med**" command.
Use the **no** form of this command to restore count to default.

Example

This example sets fast start repeat count to 10.

```
Switch(config)# lldp med fast-start-repeat-count 10
Switch# show lldp med
```



```
Switch(config)# lldp med fast-start-repeat-count 10
Switch(config)# do show lldp med

 Fast Start Repeat Count: 10
```

2.13.10 lldp med location

Syntax

lldp med location (coordination|civic-address|ecs-elin) ADDR
no lldp med location (coordination|civic-address|ecs-elin)

Parameter

coordination **civic-address** **ecs-elin**	Location type to be configured. “ecs-elin” is abbreviation of emergency call service – emergency location identifier number
ADDR	Specify the location data. Input format is hexadecimal values without colon (for example: 1234AB). For coordination location type, the length of ADDR is 16 bytes. For civic-address, the length is 6 to 160 bytes. For ecs-elin, the length is 10 to 25 bytes.

Default

Deafult is no location data.

Mode

Port Configuration

Usage

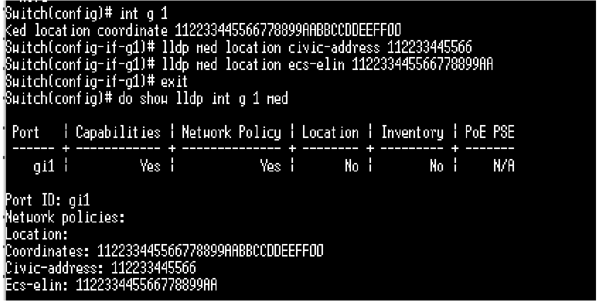
Use “**lldp med location**” command to configure the LLDP MED location data. The “coordinate”, “civic-address”, “ecs-elin” locations are independent, so at most three location TLVs could be sent if their data are not empty. The configuration of location could be shown by “**show lldp interface PORT med**” command.

Use the **no** form of this command to clear location data.

Example

This example sets location data for interface g 1.

```
Switch(config)# interface g 1
Switch(config-if)# lldp med location coordinate
1122334455667788899AABBCCDDEEFF00
Switch(config-if)# lldp med location civic-address
112233445566
Switch(config-if)# lldp med location ecs-elin
1122334455667788899AA
Switch# show lldp interfaces g 1 med
```



```
Switch(config)# int g 1
Ked location coordinate 112233445566778899AABBCCDDEEFF00
Switch(config-if-g1)# lldp med location civic-address 112233445566
Switch(config-if-g1)# lldp med location ecs-elin 112233445566778899AA
Switch(config-if-g1)# exit
Switch(config)# do show lldp int g 1 med

 Port   | Capabilities | Network Policy | Location | Inventory | PoE PSE
 ------ + ------------ + -------------- + -------- + --------- + -------
    gi1 |          Yes |            Yes |       No |        No |     N/A

Port ID: gi1
Network policies:
Location:
Coordinates: 112233445566778899AABBCCDDEEFF00
Civic-address: 112233445566
Ecs-elin: 112233445566778899AA
```

2.13.11 lldp med network-policy

Syntax

lldp med network-policy <1-32> **app (voice|voice-signaling|guest-voice|guest-voice-signaling|softphone-voice|video-conferencing|streaming- video|video-signaling) vlan** <1-4094> **vlan-type (tag|untag) priority** <0- 7> **dscp** <0-63>
no lldp med network-policy <1-32>

Parameter

<1-32>	Specify the network policy index
voice voice-signaling guest-voice guest-voice-signaling softphone-voice video-conferencing streaming-video video-signaling	Specify the network policy application type.
<1-4094>	Specify the L2 priority
Tag untag	Specify the VLAN tag status
<0-63>	Specify the DSCP value

Default

No network policy is defined

Mode

Global Configuration

Usage

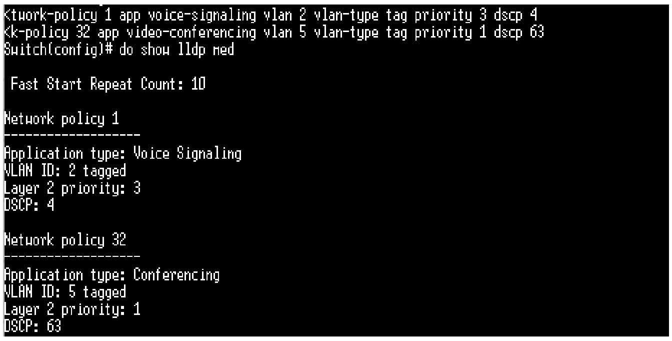
Use “**lldp med network-policy**” command to configure the LLDP MED network policy table and add a network policy entry that can be bind to ports. If LLDP MED network policy voice auto mode is enabled, “voice” type network policy can not be created since it is in auto mode. The network policy table configuration could be shown by “**show lldp med**” command.

Use the **no** form of this command to remove network policy entry of specific index. A network policy can be removed only when it is not bind to any port.

Example

This example create 2 network policies.

```
Switch(config)# lldp med network-policy 1 app voice-
signaling vlan 2 vlan-type tag priority 3 dscp 4
Switch(config)# lldp med network-policy 32 app video-
conferencing vlan 5 vlan-type tag priority 1 dscp 63
Switch# show lldp med
```



```
<twork-policy 1 app voice-signaling vlan 2 vlan-type tag priority 3 dscp 4
<k-policy 32 app video-conferencing vlan 5 vlan-type tag priority 1 dscp 63
Switch(config)# do show lldp med

 Fast Start Repeat Count: 10

Network policy 1
-------------------
Application type: Voice Signaling
VLAN ID: 2 tagged
Layer 2 priority: 3
DSCP: 4

Network policy 32
-------------------
Application type: Conferencing
VLAN ID: 5 tagged
Layer 2 priority: 1
DSCP: 63
```

2.13.12 lldp med network-policy(Interface)

Syntax **lldp med network-policy (add|remove)** <1-32>

Parameter

add	Add network policy binding for ports.
remove	Remove network policy binding for ports.
<1-32>	Specify the network policy index

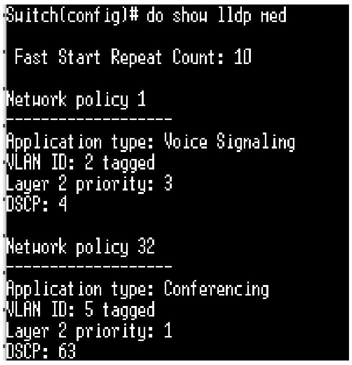
Default Default is no network policy binding to port.

Mode Port Configuration

Usage Use "**lldp med network-policy**" command to bind the network policy to port interface. The binded network policy of one port should be with different types. If network policy TLV is selected over a port, the binded network policies would be attached in LLDP MED PDU. The configuration of network policy binding could be shown by "**show lldp med**" command.

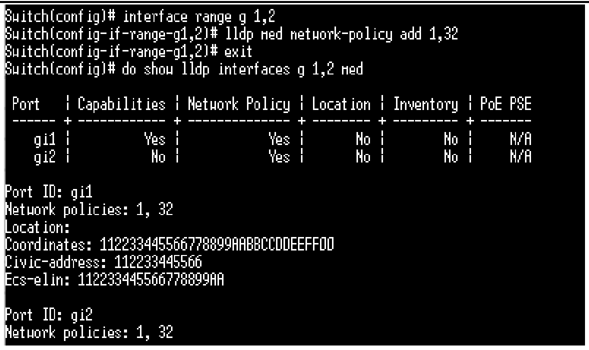
Example **This example binds network policy for interface gi1 and gi2.**

```
Switch# show lldp med
```



```
Switch(config)# do show lldp med

 Fast Start Repeat Count: 10

Network policy 1
-------------------
Application type: Voice Signaling
VLAN ID: 2 tagged
Layer 2 priority: 3
DSCP: 4

Network policy 32
-------------------
Application type: Conferencing
VLAN ID: 5 tagged
Layer 2 priority: 1
DSCP: 63
```

```
Switch(config)# interface range g 1,2
Switch(config-if-range)# lldp med network-policy add
                         1,32
Switch# show lldp interfaces g 1,2 med
```



```
Switch(config)# interface range g 1,2
Switch(config-if-range-g1,2)# lldp med network-policy add 1,32
Switch(config-if-range-g1,2)# exit
Switch(config)# do show lldp interfaces g 1,2 med

 Port   | Capabilities | Network Policy | Location | Inventory | PoE PSE
 ------ + ------------ + -------------- + -------- + --------- + -------
    gi1 |          Yes |            Yes |       No |        No |     N/A
    gi2 |           No |            Yes |       No |        No |     N/A

Port ID: gi1
Network policies: 1, 32
Location:
Coordinates: 112233445566778899AABBCCDDEEFF00
Civic-address: 112233445566
Ecs-elin: 112233445566778899AA

Port ID: gi2
Network policies: 1, 32
```

2.13.12 lldp med network-policy voice auto

Syntax	**lldp med network-policy voice auto** **no lldp med network-policy voice auto**
Parameter	N/A
Default	ldp med network-policy auto
Mode	Global Configuration
Usage	Use "**lldp med network-policy voice auto**" command to enable network policy voice auto mode. In voice auto mode, if network-policy TLV is selected, a voice type network policy would be attached to PDU that contents comes from voice VLAN configuration. This works for voice VLAN module to exchange voice VLAN information with link partner. If voice auto mode is enabled, user can not manually create an voice type network policy; if an voice type network policy is created, the voice auto mode can not be enabled. The configuration of network policy auto mode could be shown by "**show lldp med**" command. Use the no form of this command to disable voice auto mode.

Example	This example sets network policy auto mode to enable and then disable.
	`Switch (config)# lldp med network-policy auto`
	`Switch (config)# no lldp med network-policy auto`

2.13.13 lldp med tlv-select

Syntax

lldp med tlv-select MEDTLV [MEDTLV] [MEDTLV] [MEDTLV]
no lldp med tlv-select

Parameter

MEDTLV MED optional TLV. Available optional TLVs are : network-policy, location, poe-pse, inventory.

Default

network-policy TLV

Mode

Port Configuration

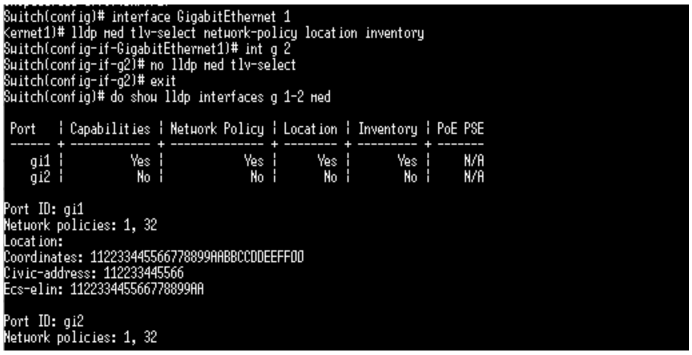
Usage

Use “lldp med tlv-select” command to configure the LLDP MED TLV Selection. It should be noticed that even no MED TLV is selected, MED capability TLV would be attached if LLDP MED is enable. The configuration could be shown by “show lldp med” command.
Use the **no** form of this command to remove all selected MED TLV over the dedicated ports.

Example

This example sets port gi1-2 to select LLDP MED network policy, location, POE-PSE, inventory TLVs, and it sets port gi3-4 to un-select all LLDP MED TLVs.

```
Switch(config)# interface gi1
Switch(config-if)# lldp med tlv-select network-policy
location inventory
Switch(config)# interface gi2 Switch(config-if)# no lldp
med tlv-select
Switch# show lldp interfaces gi1-2 med
```



```
Switch(config)# interface GigabitEthernet 1
Kernet1)# lldp med tlv-select network-policy location inventory
Switch(config-if-GigabitEthernet1)# int g 2
Switch(config-if-g2)# no lldp med tlv-select
Switch(config-if-g2)# exit
Switch(config)# do show lldp interfaces g 1-2 med

 Port   | Capabilities | Network Policy | Location | Inventory | PoE PSE
 ------ + ------------ + -------------- + -------- + --------- + -------
    gi1 |          Yes |            Yes |      Yes |       Yes |     N/A
    gi2 |           No |             No |       No |        No |     N/A

Port ID: gi1
Network policies: 1, 32
Location:
Coordinates: 112233445566778899AABBCCDDEEFF00
Civic-address: 112233445566
Ecs-elin: 112233445566778899AA

Port ID: gi2
Network policies: 1, 32
```

2.13.14 lldp tlv-select

Syntax

ldp tlv-select TLV [TLV] [TLV] [TLV] [TLV] [TLV] [TLV] [TLV]
no lldp tlv-select

Parameter

TLV	Specify the selected optional TLV. Available optional TLVs are : sys-name (system name), sys-desc (system description), sys-cap (system capability), mac-phy (802.3 MAC-PHY), lag (802.3 link aggregation), max-frame-size (802.3 max frame size), and management-add (management address).

Default

Default is no selected optional TLV.

Mode

Port Configuration

Usage

Use “**lldp tlv-select**” command to attach selected TLV in PDU. The configuration could be shown by “s**how lldp**” command.

Use the **no** form of this command to remove all selected TLV.

Example

This example selects system name, system description, system capability, 802.3 MAC-PHY, 802.3 link aggregation, 802.3 max frame size, and management address TLVs for interface gi1 and gi3.

```
Switch(config)# interface range gi 1,3
Switch(config-if-range)# lldp tlv-select port-desc sys-
name sys-desc sys-cap mac-phy lag max-frame-size
management-addr Switch(config-if-range)# end
Switch# show lldp interfaces gi1,3
 State: Disabled
 Timer: 10 Seconds↵
 Hold multiplier: 3
 Reinit delay: 2 Seconds
 Tx delay: 2 Seconds↵
 LLDP packet handling: Flooding↵

 Port     |  State | Optional TLVs   | Address↵
 -------- + ------ + -------------- + --------
      gi1 |  RX,TX | PD, SN, SD, SC |192.168.1.254↵
      gi3 |  RX,TX | PD, SN, SD, SC |192.168.1.254↵

Port ID: gi1↵
802.3 optional TLVs: 802.3-mac-phy, 802.3-lag, 802.3-max-
frame-size, management-addr↵
802.1 optional TLVs
PVID: Enabled↵

Port ID: gi3↵
802.3 optional TLVs: 802.3-mac-phy, 802.3-lag, 802.3-max-
frame-size, management-addr↵
802.1 optional TLVs
PVID: Enabled↵
```

2.13.15 lldp tlv-select pvid

Syntax

lldp tlv-select pvid (disable|enable)
no lldp tlv-select pvid

Parameter

disable	Disable LLDP 802.1 PVID TLV attach state
enable	Enable LLDP 802.1 PVID TLV attach state

Default

Default is enabled

Mode

Port Configuration

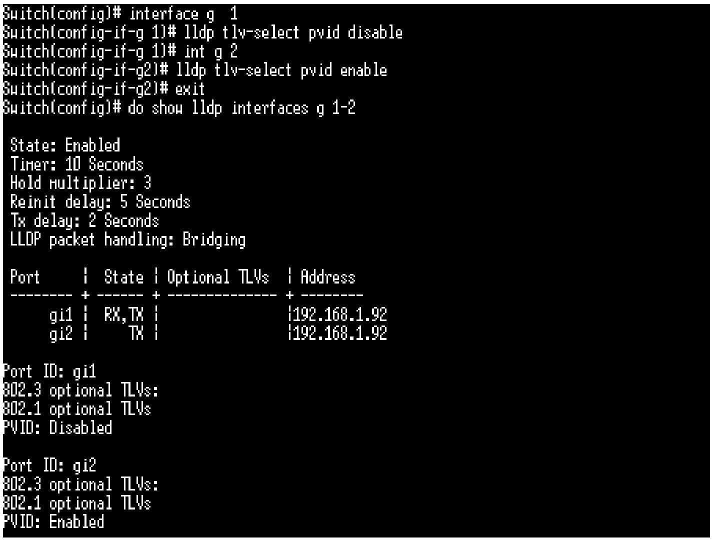
Usage

Use “**lldp tlv-select pvid**” command to configure the 802.1 PVID TLV attach enable status. The configuration could be shown by “**show lldp**” command. Use the no form of this command to restore the pvid to default value.

Example

This example sets port gi1 PVID TLV attaches status to disable and port g 2 to enable.

```
Switch(config)# interface g 1
Switch(config-if)# lldp tlv-select pvid disable
Switch(config-if)# interface g 2
Switch(config-if)# lldp tlv-select pvid enable
Switch# show lldp interfaces g 1, g 2
```



```
Switch(config)# interface g  1
Switch(config-if-g 1)# lldp tlv-select pvid disable
Switch(config-if-g 1)# int g 2
Switch(config-if-g2)# lldp tlv-select pvid enable
Switch(config-if-g2)# exit
Switch(config)# do show lldp interfaces g 1-2

 State: Enabled
 Timer: 10 Seconds
 Hold multiplier: 3
 Reinit delay: 5 Seconds
 Tx delay: 2 Seconds
 LLDP packet handling: Bridging

 Port     |  State | Optional TLVs  | Address
 -------- + ------ + -------------- + --------
      gi1 |  RX,TX |                |192.168.1.92
      gi2 |     TX |                |192.168.1.92

Port ID: gi1
802.3 optional TLVs:
802.1 optional TLVs
PVID: Disabled

Port ID: gi2
802.3 optional TLVs:
802.1 optional TLVs
PVID: Enabled
```

2.13.16 lldp tlv-select vlan-name

Syntax **lldp tlv-select vlan-name (add|remove)** VLAN-LIST

Parameter

add VLAN-LIST	Add VLAN list for LLDP 802.1 VLAN-NAME TLV on the specific interface. The configured ports should be member of all the specified VLANs or the VLAN-LIST is not valid.
remove VLAN-LIST	Remove VLAN list of LLDP 802.1 VLAN-NAME TLV from interface.

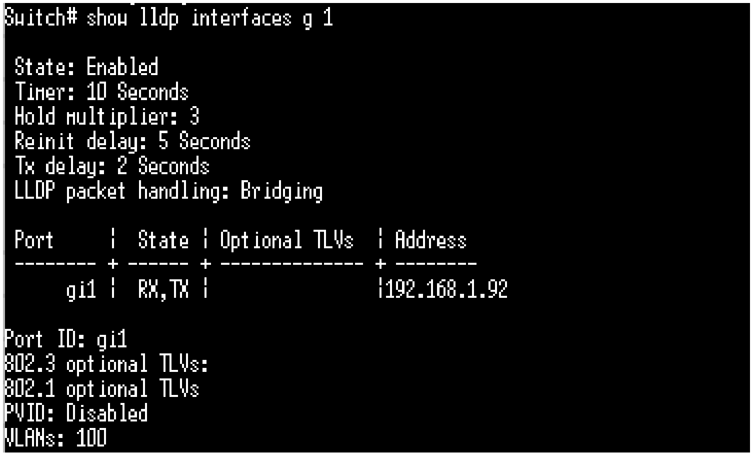
Default Default is no VLAN added.

Mode Port Configuration

Usage Use "**lldp tlv-select vlan-name**" command to add or remove VLAN l list for 802.1 VLAN-NAME TLV. The configuration could be shown by "**show lldp**" command.

Example This example add VLAN 100 to VLAN-NAME TLV for port g 10.

```
Switch(config)# vlan 100
Switch(config-vlan)# exit
Switch(config)# interface gi1
Switch(config-if)# switchport trunk allowed vlan add all
Switch(config-if)# lldp tlv-select vlan-name add 100
Switch(config-if)# end
```



```
Switch# show lldp interfaces g 1

 State: Enabled
 Timer: 10 Seconds
 Hold multiplier: 3
 Reinit delay: 5 Seconds
 Tx delay: 2 Seconds
 LLDP packet handling: Bridging

 Port     |  State | Optional TLVs  | Address
 -------- + ------ + -------------- + --------
      gi1 |  RX,TX |                |192.168.1.92

Port ID: gi1
802.3 optional TLVs:
802.1 optional TLVs
PVID: Disabled
VLANs: 100
```

2.13.17 lldp tx

Syntax **lldp / tx no lldp tx**

Parameter N/A

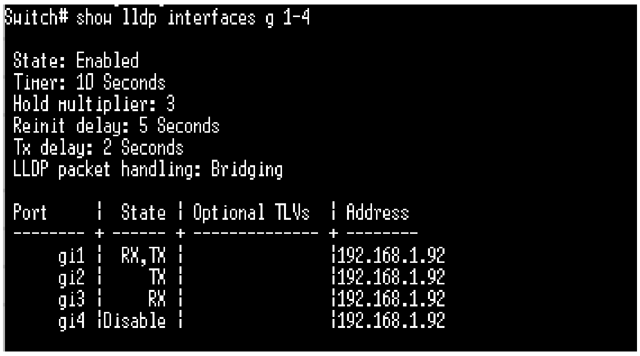
Default Default is enable

Mode Port Configuration

Usage Use “**lldp tx**” command to enable the LLDP PDU TX ability. The configuration could be shown by “show lldp” command. Use the no form of this command to disable the TX ability.

Example This example sets port g 1 to enable LLDP TX, port g 2 to disable RX but enable TX, port g 3 to enable RX but disable TX, port g 4 to disable RX and TX.

```
Switch(config)# interface g 1
Switch(config-if)# lldp rx
Switch(config-if)# lldp tx
Switch(config)# interface g 2
Switch(config-if)# no lldp rx
Switch(config-if)# lldp tx
Switch(config)# interface g 3
Switch(config-if)# lldp rx
Switch(config-if)# no lldp tx
Switch(config)# interface g 4
Switch(config-if)# no lldp rx
Switch(config-if)# no lldp tx
Switch(config-if)# end
Switch# show lldp interfaces g 1-4
```



```
Switch# show lldp interfaces g 1-4

 State: Enabled
 Timer: 10 Seconds
 Hold multiplier: 3
 Reinit delay: 5 Seconds
 Tx delay: 2 Seconds
 LLDP packet handling: Bridging

 Port     |  State | Optional TLVs  | Address
 -------- + ------ + -------------- + --------
      gi1 |  RX,TX |                |192.168.1.92
      gi2 |     TX |                |192.168.1.92
      gi3 |     RX |                |192.168.1.92
      gi4 |Disable |                |192.168.1.92
```

2.13.18 lldp tx-delay

Syntax	**lldp tx-delay <1-8192>** **no lldp tx-delay**
Parameter	<1-8192> Specify the LLDP tx delay in unit of seconds.
Default	Default TX delay is 2 seconds
Mode	Global Configuration
Usage	Use "**lldp tx-delay**" command to configure the delay in seconds between successive LLDP frame transmissions. The delay starts to count in any case LLDP PDU is sent such as by LLDP PDU advertise routine, LLDP PDU content change, port link up, etc. The configuration could be shown by "**show lldp**" command. Use the **no** form of this command to restore the delay to default value

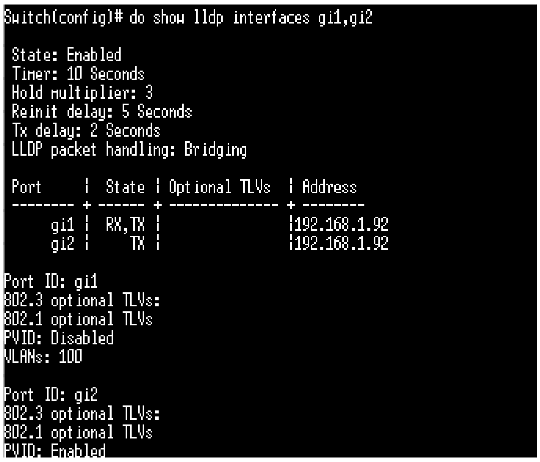
Example	This example sets LLDP PDU TX delay to 10 seconds.
	`Switch(config)# lldp tx-delay 10`
	`Switch# show lldp`

2.13.19 show lldp

Syntax	**show lldp** **show lldp interface** IF_NMLPORTS	
Parameter	IF_NMLPORTS	Specify the ports to display information
Default	This command has no default value.	
Mode	Privileged EXEC	
Usage	Use “show lldp” and “show lldp interface” commands to display LLDP global information including LLDP enable status, LLDP PDU TX interval, hold time multiplier, re-initial delay, TX delay, and LLDP packet handling when LLDP is disabled. The per port information displayed includes port LLDP RX/TX enable status, selected TLV to TX and IP address. The abbreviations in optional TLVs are: port description (PD), system name (SN),system description (SD), and system capability (SC).	

Example This example displays lldp information of port gi1 and gi2

```
Switch# show lldp interfaces gi1,gi2
```



```
Switch(config)# do show lldp interfaces gi1,gi2

 State: Enabled
 Timer: 10 Seconds
 Hold multiplier: 3
 Reinit delay: 5 Seconds
 Tx delay: 2 Seconds
 LLDP packet handling: Bridging

 Port     ¦  State ¦ Optional TLVs  ¦ Address
 -------- + ------ + -------------- + --------
      gi1 ¦  RX,TX ¦                ¦192.168.1.92
      gi2 ¦     TX ¦                ¦192.168.1.92

Port ID: gi1
802.3 optional TLVs:
802.1 optional TLVs
PVID: Disabled
VLANs: 100

Port ID: gi2
802.3 optional TLVs:
802.1 optional TLVs
PVID: Enabled
```

2.13.20 show lldp local-device

Syntax **show lldp local-device**
show lldp interfaces IF_NMLPORTS **local-device**

Parameter IF_NMLPORTS Specify the ports to display information

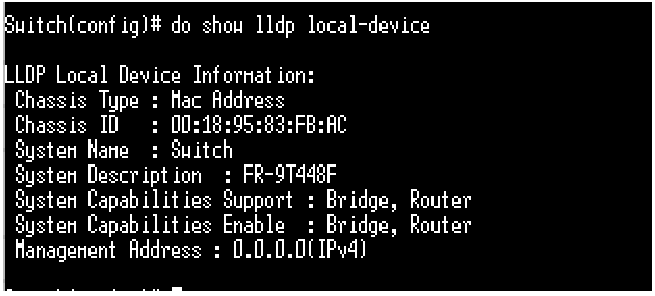
Default There is no default configuration for this command

Mode Privileged EXEC

Usage Use “show lldp local-device” command to show the local configuration of LLDP PDU. By the commands, a user can view the contents of LLDP/ LLDP-MED TLVs that would be attached in LLDP PDU.

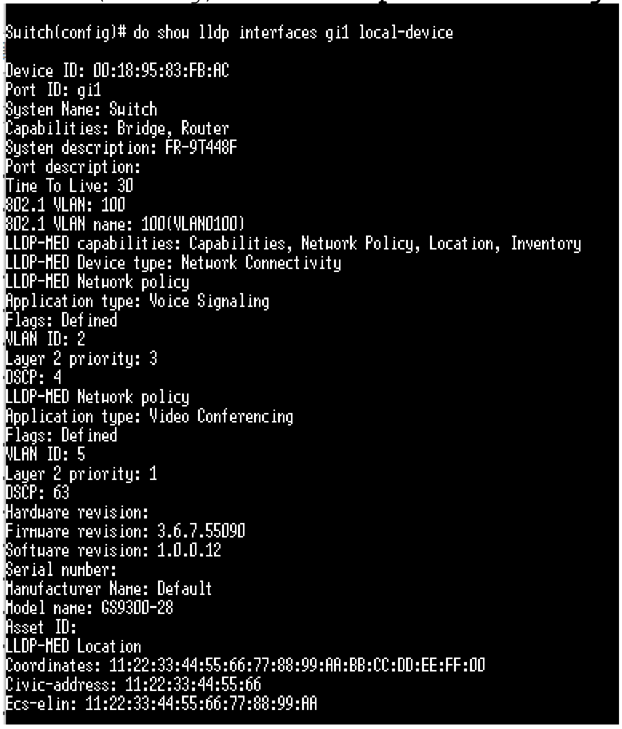
Example This example displays the local device information.

```
Switch# show lldp local-device
```



```
Switch(config)# do show lldp local-device

LLDP Local Device Information:
 Chassis Type : Mac Address
 Chassis ID   : 00:18:95:83:FB:AC
 System Name  : Switch
 System Description  : FR-9T448F
 System Capabilities Support : Bridge, Router
 System Capabilities Enable  : Bridge, Router
 Management Address : 0.0.0.0(IPv4)
```

```
Switch(config)# show lldp interfaces gi1 local-device
```

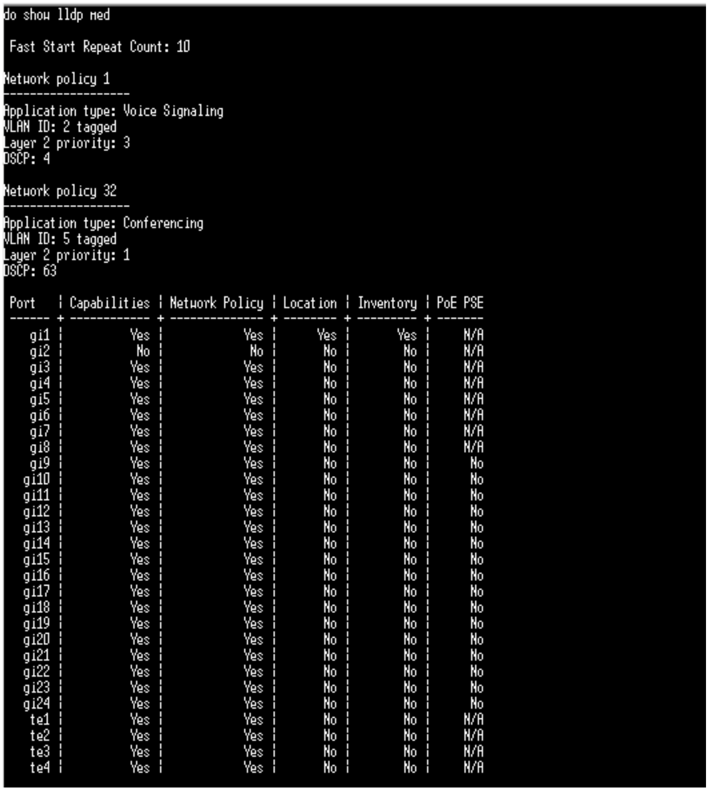


```
Switch(config)# do show lldp interfaces gi1 local-device

Device ID: 00:18:95:83:FB:AC
Port ID: gi1
System Name: Switch
Capabilities: Bridge, Router
System description: FR-9T448F
Port description:
Time To Live: 30
802.1 VLAN: 100
802.1 VLAN name: 100(VLAN0100)
LLDP-MED capabilities: Capabilities, Network Policy, Location, Inventory
LLDP-MED Device type: Network Connectivity
LLDP-MED Network policy
Application type: Voice Signaling
Flags: Defined
VLAN ID: 2
Layer 2 priority: 3
DSCP: 4
LLDP-MED Network policy
Application type: Video Conferencing
Flags: Defined
VLAN ID: 5
Layer 2 priority: 1
DSCP: 63
Hardware revision:
Firmware revision: 3.6.7.55090
Software revision: 1.0.0.12
Serial number:
Manufacturer Name: Default
Model name: GS9300-28
Asset ID:
LLDP-MED Location
Coordinates: 11:22:33:44:55:66:77:88:99:AA:BB:CC:DD:EE:FF:00
Civic-address: 11:22:33:44:55:66
Ecs-elin: 11:22:33:44:55:66:77:88:99:AA
```

2.13.21 show lldp med

Syntax	**show lldp med** **show lldp interfaces** IF_NMLPORTS **med**
Parameter	IF_NMLPORTS Specify the ports to display information
Default	There is no default configuration for this command
Mode	Privileged EXEC
Usage	Use “show lldp med” command to display the LLDP MED configuration information.
Example	**This example displays the local device information.**

```
Switch# show lldp med
```



```
do show lldp med

 Fast Start Repeat Count: 10

Network policy 1
-------------------
Application type: Voice Signaling
VLAN ID: 2 tagged
Layer 2 priority: 3
DSCP: 4

Network policy 32
-------------------
Application type: Conferencing
VLAN ID: 5 tagged
Layer 2 priority: 1
DSCP: 63

 Port   ¦ Capabilities ¦ Network Policy ¦ Location ¦ Inventory ¦ PoE PSE
 ------ + ------------ + -------------- + -------- + --------- + -------
    gi1 ¦          Yes ¦            Yes ¦      Yes ¦       Yes ¦     N/A
    gi2 ¦           No ¦             No ¦       No ¦        No ¦     N/A
    gi3 ¦          Yes ¦            Yes ¦       No ¦        No ¦     N/A
    gi4 ¦          Yes ¦            Yes ¦       No ¦        No ¦     N/A
    gi5 ¦          Yes ¦            Yes ¦       No ¦        No ¦     N/A
    gi6 ¦          Yes ¦            Yes ¦       No ¦        No ¦     N/A
    gi7 ¦          Yes ¦            Yes ¦       No ¦        No ¦     N/A
    gi8 ¦          Yes ¦            Yes ¦       No ¦        No ¦     N/A
    gi9 ¦          Yes ¦            Yes ¦       No ¦        No ¦      No
   gi10 ¦          Yes ¦            Yes ¦       No ¦        No ¦      No
   gi11 ¦          Yes ¦            Yes ¦       No ¦        No ¦      No
   gi12 ¦          Yes ¦            Yes ¦       No ¦        No ¦      No
   gi13 ¦          Yes ¦            Yes ¦       No ¦        No ¦      No
   gi14 ¦          Yes ¦            Yes ¦       No ¦        No ¦      No
   gi15 ¦          Yes ¦            Yes ¦       No ¦        No ¦      No
   gi16 ¦          Yes ¦            Yes ¦       No ¦        No ¦      No
   gi17 ¦          Yes ¦            Yes ¦       No ¦        No ¦      No
   gi18 ¦          Yes ¦            Yes ¦       No ¦        No ¦      No
   gi19 ¦          Yes ¦            Yes ¦       No ¦        No ¦      No
   gi20 ¦          Yes ¦            Yes ¦       No ¦        No ¦      No
   gi21 ¦          Yes ¦            Yes ¦       No ¦        No ¦      No
   gi22 ¦          Yes ¦            Yes ¦       No ¦        No ¦      No
   gi23 ¦          Yes ¦            Yes ¦       No ¦        No ¦      No
   gi24 ¦          Yes ¦            Yes ¦       No ¦        No ¦      No
    te1 ¦          Yes ¦            Yes ¦       No ¦        No ¦     N/A
    te2 ¦          Yes ¦            Yes ¦       No ¦        No ¦     N/A
    te3 ¦          Yes ¦            Yes ¦       No ¦        No ¦     N/A
    te4 ¦          Yes ¦            Yes ¦       No ¦        No ¦     N/A
```

2.13.22 show lldp neighbor

Syntax **show lldp neighbor**
show lldp interfaces IF_NMLPORTS **neighbor**

Parameter IF_NMLPORTS Specify the ports to display information

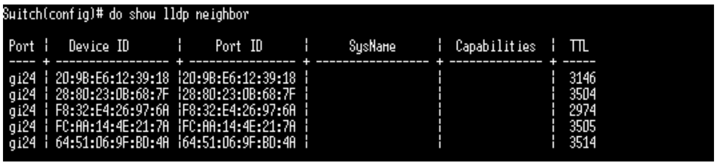
Default There is no default configuration for this command

Mode Privileged EXEC

Usage Use “show lldp neighbor” command to display the received neighbor LLDP PDU information. When LLDP PDU is received on LLDP RX enable ports, system would store the PDU information in database until time to live of the PDU counts down to zero.

Example **This example displays the neighbor information.**

```
Switch# show lldp neighbor
```



```
Switch(config)# do show lldp neighbor

Port |   Device ID       |    Port ID        |      SysName      | Capabilities  | TTL
---- + ----------------- + ----------------- + ----------------- + ------------- + -----
gi24 | 20:9B:E6:12:39:18 |20:9B:E6:12:39:18 |                   |               | 3146
gi24 | 28:80:23:0B:68:7F |28:80:23:0B:68:7F |                   |               | 3504
gi24 | F8:32:E4:26:97:6A |F8:32:E4:26:97:6A |                   |               | 2974
gi24 | FC:AA:14:4E:21:7A |FC:AA:14:4E:21:7A |                   |               | 3505
gi24 | 64:51:06:9F:BD:4A |64:51:06:9F:BD:4A |                   |               | 3514
```

```
Switch# show lldp interfaces gi 3 neighbor
```

2.13.23 show lldp statistics

Syntax **show lldp statistics**
show lldp interfaces IF_NMLPORTS **statistics**

Parameter IF_NMLPORTS Specify the ports to display information

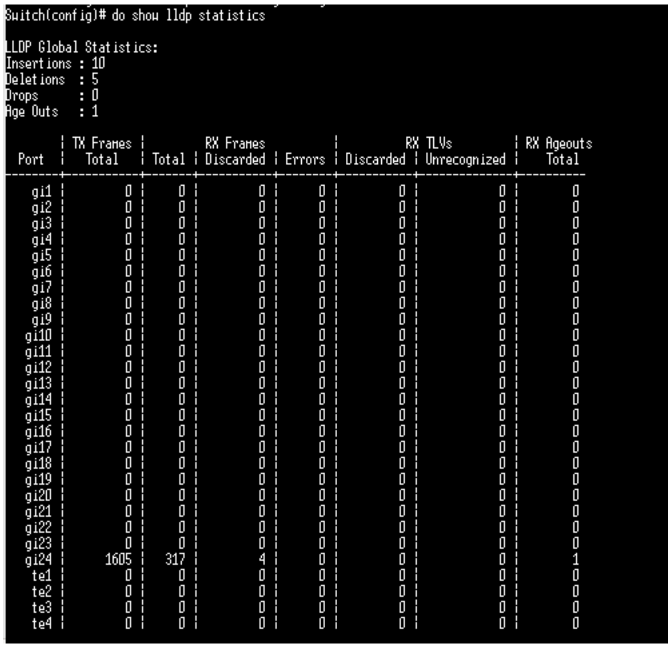
Default There is no default configuration for this command

Mode Privileged EXEC

Usage Use “show lldp statistics” command to display the LLDP RX/TX statistics.

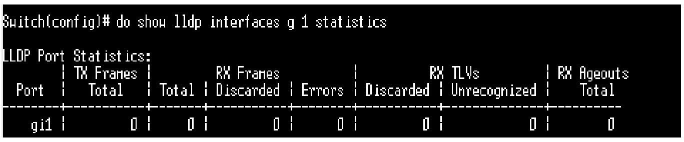
Example This example display the LLDP statistics.

```
Switch# show lldp statistics
```



```
Switch(config)# do show lldp statistics

LLDP Global Statistics:
Insertions : 10
Deletions  : 5
Drops      : 0
Age Outs   : 1

        ¦ TX Frames ¦            RX Frames             ¦          RX TLVs           ¦ RX Ageouts
  Port  ¦   Total   ¦ Total ¦ Discarded ¦ Errors ¦ Discarded ¦ Unrecognized ¦   Total
--------+-----------+-------+-----------+--------+-----------+--------------+----------
   gi1  ¦         0 ¦     0 ¦         0 ¦      0 ¦         0 ¦            0 ¦        0
   gi2  ¦         0 ¦     0 ¦         0 ¦      0 ¦         0 ¦            0 ¦        0
   gi3  ¦         0 ¦     0 ¦         0 ¦      0 ¦         0 ¦            0 ¦        0
   gi4  ¦         0 ¦     0 ¦         0 ¦      0 ¦         0 ¦            0 ¦        0
   gi5  ¦         0 ¦     0 ¦         0 ¦      0 ¦         0 ¦            0 ¦        0
   gi6  ¦         0 ¦     0 ¦         0 ¦      0 ¦         0 ¦            0 ¦        0
   gi7  ¦         0 ¦     0 ¦         0 ¦      0 ¦         0 ¦            0 ¦        0
   gi8  ¦         0 ¦     0 ¦         0 ¦      0 ¦         0 ¦            0 ¦        0
   gi9  ¦         0 ¦     0 ¦         0 ¦      0 ¦         0 ¦            0 ¦        0
  gi10  ¦         0 ¦     0 ¦         0 ¦      0 ¦         0 ¦            0 ¦        0
  gi11  ¦         0 ¦     0 ¦         0 ¦      0 ¦         0 ¦            0 ¦        0
  gi12  ¦         0 ¦     0 ¦         0 ¦      0 ¦         0 ¦            0 ¦        0
  gi13  ¦         0 ¦     0 ¦         0 ¦      0 ¦         0 ¦            0 ¦        0
  gi14  ¦         0 ¦     0 ¦         0 ¦      0 ¦         0 ¦            0 ¦        0
  gi15  ¦         0 ¦     0 ¦         0 ¦      0 ¦         0 ¦            0 ¦        0
  gi16  ¦         0 ¦     0 ¦         0 ¦      0 ¦         0 ¦            0 ¦        0
  gi17  ¦         0 ¦     0 ¦         0 ¦      0 ¦         0 ¦            0 ¦        0
  gi18  ¦         0 ¦     0 ¦         0 ¦      0 ¦         0 ¦            0 ¦        0
  gi19  ¦         0 ¦     0 ¦         0 ¦      0 ¦         0 ¦            0 ¦        0
  gi20  ¦         0 ¦     0 ¦         0 ¦      0 ¦         0 ¦            0 ¦        0
  gi21  ¦         0 ¦     0 ¦         0 ¦      0 ¦         0 ¦            0 ¦        0
  gi22  ¦         0 ¦     0 ¦         0 ¦      0 ¦         0 ¦            0 ¦        0
  gi23  ¦         0 ¦     0 ¦         0 ¦      0 ¦         0 ¦            0 ¦        0
  gi24  ¦      1605 ¦   317 ¦         4 ¦      0 ¦         0 ¦            0 ¦        1
   te1  ¦         0 ¦     0 ¦         0 ¦      0 ¦         0 ¦            0 ¦        0
   te2  ¦         0 ¦     0 ¦         0 ¦      0 ¦         0 ¦            0 ¦        0
   te3  ¦         0 ¦     0 ¦         0 ¦      0 ¦         0 ¦            0 ¦        0
   te4  ¦         0 ¦     0 ¦         0 ¦      0 ¦         0 ¦            0 ¦        0
```

```
Switch# show lldp int g 1 statistics
```



```
Switch(config)# do show lldp interfaces g 1 statistics

LLDP Port Statistics:
        ¦ TX Frames ¦            RX Frames             ¦          RX TLVs           ¦ RX Ageouts
  Port  ¦   Total   ¦ Total ¦ Discarded ¦ Errors ¦ Discarded ¦ Unrecognized ¦   Total
--------+-----------+-------+-----------+--------+-----------+--------------+----------
   gi1  ¦         0 ¦     0 ¦         0 ¦      0 ¦         0 ¦            0 ¦        0
```

2.13.24 show lldp tlv-overloading

Syntax **show lldp interfaces** IF_NMLPORTS **tlvs-overloading**

Parameter IF_NMLPORTS Specify the ports to display information

Default There is no default configuration for this command

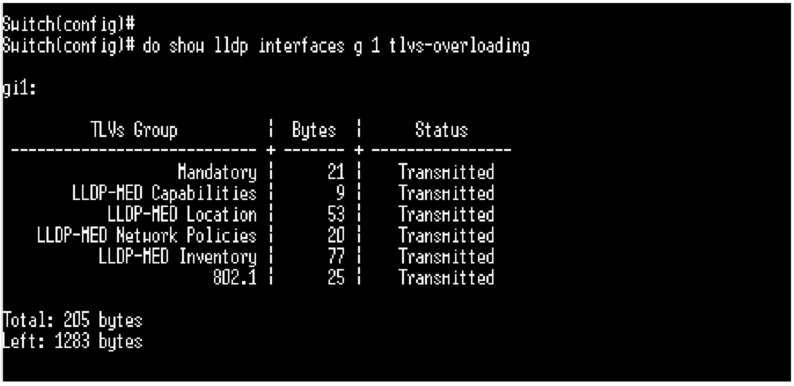
Mode Privileged EXEC

Usage The LLDP PDU is composed by TLVs and selected number TLVs may compose a large PDU that the system can not handle. The maximum PDU length is to take the smaller number of jumbo frame size minus 30 bytes (30 bytes kept for header) or 1488 bytes.

Use "**show lldp tlv-overloading**" command to display the length of LLDP TLVs and if the TLVs overload the PDU length. The TLVs with status marked "overload" would not be transmitted.

Example **This example display the LLDP TLVs overloading status of port gi1.**

```
Switch# show lldp interfaces gi1 tlvs-overloading
```



```
Switch(config)#
Switch(config)# do show lldp interfaces g 1 tlvs-overloading

gi1:

          TLVs Group           |  Bytes  |      Status
 ----------------------------- + ------- + ---------------
                     Mandatory |      21 |    Transmitted
         LLDP-MED Capabilities |       9 |    Transmitted
             LLDP-MED Location |      53 |    Transmitted
     LLDP-MED Network Policies |      20 |    Transmitted
            LLDP-MED Inventory |      77 |    Transmitted
                         802.1 |      25 |    Transmitted

Total: 205 bytes
Left: 1283 bytes
```

2.14 Logging

2.14.1 clear logging

Syntax	**clear logging (buffered|file)**
Parameter	**buffered** Clear the log messages stored in the RAM. **file** Clear the log messages stored in the Flash.
Default	N/A
Mode	Privileged EXEC
Usage	To clear the log messages from the internal logging buffer and flash, use the command clear logging in the Privileged EXEC mode.

Example	**The following example clear the log messages stored in RAM and Flash.**
	`Switch# clear logging buffered`
	`Switch# clear logging file`

2.14.2 logging

Syntax	**logging / no logging**
Parameter	N/A
Default	Logging service is enabled.
Mode	Privileged EXEC
Usage	To enable logging service on the switch, use the command **logging** in the Global Configuration mode. Otherwise, use the **no** form of the command to disable the logging service on the switch. The status of global logging server is available from the command **show logging** in the Privileged EXEC mode. When the logging service is enabled, logging on and off at each destination rule can be individually configured by the command **logging console, logging buffered, logging file**, and **logging host** in the Global Configuration mode. If the logging service is disabled, no messages will be sent to these destinations.

Example	The following example disables and enables the logging service on the switch.
	`Switch(config)# no logging`
	`Switch(config)# logging`

2.14.3 logging host

Syntax

logging host (ip-addr|hostname**) [facility** facility**] [port** port**] [severity** sev**]**
no logging host (ip-addr|hostname**)**

Parameter

ipv4-addr	IPv4 address of the remote logging server.
hostname	Hostname of the remote logging server.
facility facility	Specify the facility of the logging messages. It can be on of the following value: local0, local1, local2, local3, local4, local5, local6, and local7. The default value of facility is local7.
port port	Specify the port number of the remote logging server.The valid range is from 0 to 65535, and the default value is 512.
severity sev	Specify the minimum severity of the logging messages. The valid range is from 0 to 7, and the number 0 to 7 represents emerg, alert, critical, error, warning, notice, info, and debug individually. The default value of minimum severity level is 5 (emerg, alert, crit, error, warning, notice).

Default

No remote logging destination is configured.

Mode

Global Configuration

Usage

To define the logging server, use the command **logging host** to add the remote logging server in the Global Configuration mode. Otherwise, use the command **no logging host** to remove the remote logging rules.

For the host name configuration, logging service would try translating the host name to IP address directly. Add the logging host would be failed on the failure of host name translating.

Example

The following example adds the remote logging rules by IP and Hostname.

```
Switch(config)# logging host 1.2.3.4
Switch(config)# logging host SYSLOG
```

2.14.4 logging severity

Syntax

logging (buffered|console|file) [severity sev]
no logging (buffered|console|file)

Parameter

Buffered	Log Messages to RAM.
Console	Log messages to console buffer.
file	Log messages to Flash
severity	Specify the minimum severity of the logging messages.The valid range is from 0 to 7, and the number 0 to 7 represents emerg, alert, critical, error, warning, notice, info, and debug individually. The default minimum severity of the logging severity configuration is 5 (emerg, alert, crit, error, warning, notice).

Default

Logging to buffered and console is enabled, and the default minimum severity level is 5 (emerg, alert, crit, error, warning, notice).

Mode

Global Configuration

Usage

To set the minimum severity for the messages that are logged to RAM, console, or Flash, use the command logging severity in the Global Configuration mode. Use the no form of the command to remove the mechanism of logging to RAM, console, or Flash individually.

Example

The following example sets the minimum severity level of logging to RAM and Flash as debugging.

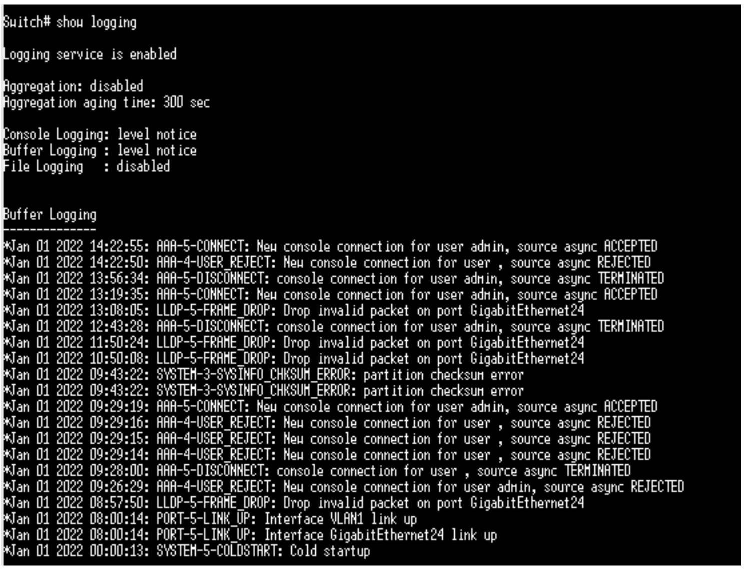
```
Switch(config)# logging buffered 7
Switch(config)# logging flash 7
```

2.14.5 show logging

Syntax	**show logging [buffered|file]**
Parameter	**Buffered** Display the log messages stored in the RAM. **file** Display the log messages stored in the Flash.
Default	N/A
Mode	Previledged EXEC
Usage	To display the global logging configuration, and the logging messages stored in the RAM and Flash, use the command show logging in the Privileged EXEC mode.

Example **The following example shows the global logging configuration.**

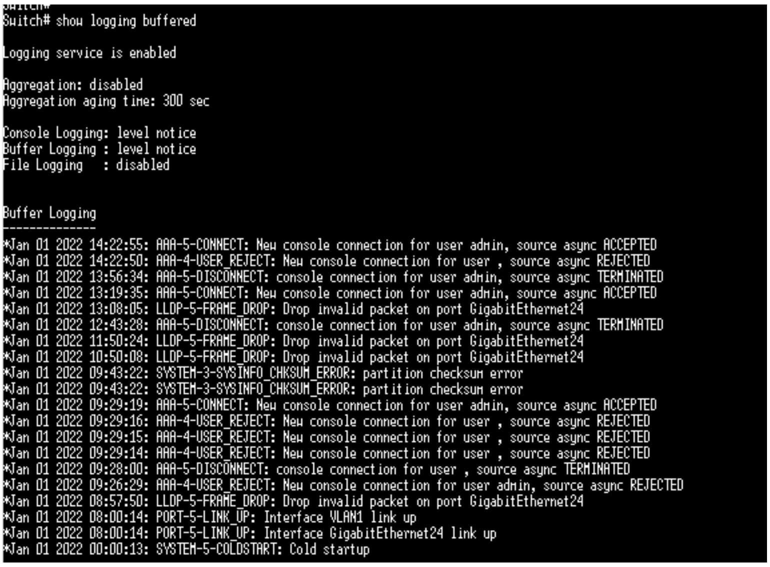
```
Switch# show logging
```



```
Switch# show logging

Logging service is enabled

Aggregation: disabled
Aggregation aging time: 300 sec

Console Logging: level notice
Buffer Logging : level notice
File Logging   : disabled


Buffer Logging
--------------
*Jan 01 2022 14:22:55: AAA-5-CONNECT: New console connection for user admin, source async ACCEPTED
*Jan 01 2022 14:22:50: AAA-4-USER_REJECT: New console connection for user , source async REJECTED
*Jan 01 2022 13:56:34: AAA-5-DISCONNECT: console connection for user admin, source async TERMINATED
*Jan 01 2022 13:19:35: AAA-5-CONNECT: New console connection for user admin, source async ACCEPTED
*Jan 01 2022 13:08:05: LLDP-5-FRAME_DROP: Drop invalid packet on port GigabitEthernet24
*Jan 01 2022 12:43:28: AAA-5-DISCONNECT: console connection for user admin, source async TERMINATED
*Jan 01 2022 11:50:24: LLDP-5-FRAME_DROP: Drop invalid packet on port GigabitEthernet24
*Jan 01 2022 10:50:08: LLDP-5-FRAME_DROP: Drop invalid packet on port GigabitEthernet24
*Jan 01 2022 09:43:22: SYSTEM-3-SYSINFO_CHKSUM_ERROR: partition checksum error
*Jan 01 2022 09:43:22: SYSTEM-3-SYSINFO_CHKSUM_ERROR: partition checksum error
*Jan 01 2022 09:29:19: AAA-5-CONNECT: New console connection for user admin, source async ACCEPTED
*Jan 01 2022 09:29:16: AAA-4-USER_REJECT: New console connection for user , source async REJECTED
*Jan 01 2022 09:29:15: AAA-4-USER_REJECT: New console connection for user , source async REJECTED
*Jan 01 2022 09:29:14: AAA-4-USER_REJECT: New console connection for user , source async REJECTED
*Jan 01 2022 09:28:00: AAA-5-DISCONNECT: console connection for user , source async TERMINATED
*Jan 01 2022 09:26:29: AAA-4-USER_REJECT: New console connection for user admin, source async REJECTED
*Jan 01 2022 08:57:50: LLDP-5-FRAME_DROP: Drop invalid packet on port GigabitEthernet24
*Jan 01 2022 08:00:14: PORT-5-LINK_UP: Interface VLAN1 link up
*Jan 01 2022 08:00:14: PORT-5-LINK_UP: Interface GigabitEthernet24 link up
*Jan 01 2022 00:00:13: SYSTEM-5-COLDSTART: Cold startup
```

The following example shows the log messages stored in the RAM.

```
Switch# show logging buffered
```



```
Switch#
Switch# show logging buffered

Logging service is enabled

Aggregation: disabled
Aggregation aging time: 300 sec

Console Logging: level notice
Buffer Logging : level notice
File Logging   : disabled


Buffer Logging
--------------
*Jan 01 2022 14:22:55: AAA-5-CONNECT: New console connection for user admin, source async ACCEPTED
*Jan 01 2022 14:22:50: AAA-4-USER_REJECT: New console connection for user , source async REJECTED
*Jan 01 2022 13:56:34: AAA-5-DISCONNECT: console connection for user admin, source async TERMINATED
*Jan 01 2022 13:19:35: AAA-5-CONNECT: New console connection for user admin, source async ACCEPTED
*Jan 01 2022 13:08:05: LLDP-5-FRAME_DROP: Drop invalid packet on port GigabitEthernet24
*Jan 01 2022 12:43:28: AAA-5-DISCONNECT: console connection for user admin, source async TERMINATED
*Jan 01 2022 11:50:24: LLDP-5-FRAME_DROP: Drop invalid packet on port GigabitEthernet24
*Jan 01 2022 10:50:08: LLDP-5-FRAME_DROP: Drop invalid packet on port GigabitEthernet24
*Jan 01 2022 09:43:22: SYSTEM-3-SYSINFO_CHKSUM_ERROR: partition checksum error
*Jan 01 2022 09:43:22: SYSTEM-3-SYSINFO_CHKSUM_ERROR: partition checksum error
*Jan 01 2022 09:29:19: AAA-5-CONNECT: New console connection for user admin, source async ACCEPTED
*Jan 01 2022 09:29:16: AAA-4-USER_REJECT: New console connection for user , source async REJECTED
*Jan 01 2022 09:29:15: AAA-4-USER_REJECT: New console connection for user , source async REJECTED
*Jan 01 2022 09:29:14: AAA-4-USER_REJECT: New console connection for user , source async REJECTED
*Jan 01 2022 09:28:00: AAA-5-DISCONNECT: console connection for user , source async TERMINATED
*Jan 01 2022 09:26:29: AAA-4-USER_REJECT: New console connection for user admin, source async REJECTED
*Jan 01 2022 08:57:50: LLDP-5-FRAME_DROP: Drop invalid packet on port GigabitEthernet24
*Jan 01 2022 08:00:14: PORT-5-LINK_UP: Interface VLAN1 link up
*Jan 01 2022 08:00:14: PORT-5-LINK_UP: Interface GigabitEthernet24 link up
*Jan 01 2022 00:00:13: SYSTEM-5-COLDSTART: Cold startup
```

2.15 MAC Address Table

2.15.1 clear mac address-table

Syntax	**clear mac address-table dynamic [interfaces** IF_PORTS**|vlan** vlan-id**]**
Parameter	**interfaces** IF_PORTS: Delete all dynamic addresses learned on the specific interface. **vlan** vlan-id: Delete all source addresses learned on the specific VLAN.
Default	N/A
Mode	Privileged EXEC
Usage	To clear the dynamic (learned) MAC entries from the MAC address table, the specific interface, or the specific VLAN, use the command clear mac address-table in the Priveleged EXEC mode.
Example	The following example clears the learned MAC addresses on the interface gi1. `Switch# clear mac address-table dynamic interfaces gi1`

2.15.2 mac address-table aging-time

Syntax

mac access-table aging-time seconds

Parameter

seconds	The time in seconds that an entry remains in the MAC address table. Its valid range is from 10 to 630 seconds,and the default value is 300 seconds.

Default

The default aging time is 300 seconds.

Mode

Global Configuration

Usage

To set the aging time of the MAC address table, use the command **mac address-table aging-time** in the Global Configuration mode.

Example

The following example set the agimg time to 500 seconds.

```
Switch(config)# mac address-table aging-time 500
```

2.15.3 mac address-table static

Syntax

mac address-table static mac-addr **vlan** vlan-id **interfaces** IF_PORTS
mac address-table static mac-addr **vlan** vlan-id **drop**
no mac address-table static mac-addr **vlan** vlan-id

Parameter

mac-addr	MAC address.
vlan vlan-id	Specify the VLAN ID for the interface.
Interface IF_PORTS	Specify the interface ID or a list of interface IDs.
drop	Drop the packets with the specified source or destination unicast MAC address.

Default

No static addresses are configured

Mode

Global Configuration

Usage

To add a static address to the MAC address table, use the command **mac address-table static** in the Global Configuration mode. For the unicast MAC address filtering, use the command **mac address-table static** with parameter **drop** to drop the packets with the specified source or destination unist MAC address. To delete the static entry from the MAC address table, use the **no** form of the command.

Example The following example adds a static address into MAC address table.

```
Switch# mac address-table static 00:11:22:33:44:55 vlan
        1 interfaces g 5
```

The following example adds a rule of unist address filtering into MAC address table.

```
Switch# mac address-table static 00:11:22:33:44:55 vlan
        1 drop
```

2.15.4 show mac address-table

Syntax **show mac address-table [dynamic|static] [interface IF_PORTS] [vlan vlan-id] show mac address-table [mac-addr] [vlan vlan-id]**

Parameter

dynamic	Display only dynamic MAC addresses
static	Display only static MAC addresses
Interface IF_PORTS	Display the MAC addresses entries for a specifc interface.
vlan vlan-id	Display the MAC address entries for a specific VLAN.
mac-addr	Display entries for a specific MAC address

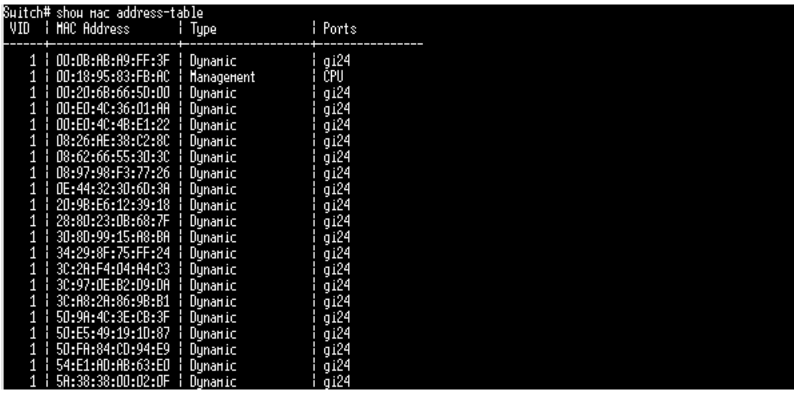
Default N/A

Mode Privileged EXEC

Usage To show the entry in the MAC address table, use the command show mac address-table in the Privilieged EXEC mode.

Example The following example displays the entire MAC addrss table.

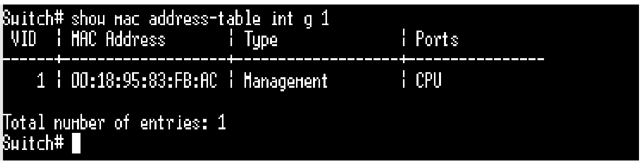
```
Switch# show mac address-table
```



```
Switch# show mac address-table
 VID  ¦ MAC Address       ¦ Type              ¦ Ports
------+-------------------+-------------------+----------------
    1 ¦ 00:0B:AB:A9:FF:3F ¦ Dynamic           ¦ gi24
    1 ¦ 00:18:95:83:FB:AC ¦ Management        ¦ CPU
    1 ¦ 00:20:6B:66:5D:00 ¦ Dynamic           ¦ gi24
    1 ¦ 00:E0:4C:36:01:AA ¦ Dynamic           ¦ gi24
    1 ¦ 00:E0:4C:4B:E1:22 ¦ Dynamic           ¦ gi24
    1 ¦ 08:26:AE:38:C2:8C ¦ Dynamic           ¦ gi24
    1 ¦ 08:62:66:55:30:3C ¦ Dynamic           ¦ gi24
    1 ¦ 08:97:98:F3:77:26 ¦ Dynamic           ¦ gi24
    1 ¦ 0E:44:32:30:6D:3A ¦ Dynamic           ¦ gi24
    1 ¦ 20:9B:E6:12:39:18 ¦ Dynamic           ¦ gi24
    1 ¦ 28:8D:23:0B:68:7F ¦ Dynamic           ¦ gi24
    1 ¦ 30:8D:99:15:A8:BA ¦ Dynamic           ¦ gi24
    1 ¦ 34:29:8F:75:FF:24 ¦ Dynamic           ¦ gi24
    1 ¦ 3C:2A:F4:04:A4:C3 ¦ Dynamic           ¦ gi24
    1 ¦ 3C:97:0E:B2:D9:DA ¦ Dynamic           ¦ gi24
    1 ¦ 3C:A8:2A:86:9B:B1 ¦ Dynamic           ¦ gi24
    1 ¦ 50:9A:4C:3E:CB:3F ¦ Dynamic           ¦ gi24
    1 ¦ 50:E5:49:19:1D:87 ¦ Dynamic           ¦ gi24
    1 ¦ 50:FA:84:CD:94:E9 ¦ Dynamic           ¦ gi24
    1 ¦ 54:E1:AD:AB:63:E0 ¦ Dynamic           ¦ gi24
    1 ¦ 5A:38:38:00:02:0F ¦ Dynamic           ¦ gi24
```

The following example displays the static MAC address configuration for the interface g 1.

```
Switch# show mac address-table static interfaces g 1
```



```
Switch# show mac address-table int g 1
 VID  | MAC Address       | Type               | Ports
------+-------------------+--------------------+----------------
    1 | 00:18:95:83:FB:AC | Management         | CPU

Total number of entries: 1
Switch#
```

The following example displays address table entries containing the specified MAC address.

```
Switch# show mac address-table 00:11:22:33:44:55 vlan
```

2.15.5 show mac address-table counters

Syntax **show mac address-table counters**

Parameter N/A

Default N/A

Mode **Privileged EXEC**

Usage To display the total entries in the MAC addrss table, use the command show mac address-table counters in the Privilieged EXEC mode.

Example The following example display numbers of addresses in the address table.

```
Switch# show mac address-table counters
```

2.15.6 show mac address-table aging-time

Syntax **show mac address-table aging-time**

Parameter **N/A**

Default **N/A**

Mode **Privileged EXEC**

Usage To show MAC address aging time, use the command show mac address-table aging-time in the Privilieged EXEC mode.

Example The following example displays aging time for the MAC address table.

```
Switch# show mac address-table aging-time
```

2.16 MAC VLAN

2.16.1 vlan mac-vlan group(Global)

Syntax **vlan mac-vlan group** <1- 2147483647> **mac-address mask** <9-48>
no vlan mac-vlan group mac-address mask <9-48>

Parameter

<1-2147483647>	Specify the group ID
Mac-address	Specify the MAC address to be mapped.
<9-48>	Specify the mask length of MAC address.

Default No MAC Groups are configured.

Mode Global Configuration

Usage Use the "**vlan mac-vlan group**" command to create MAC address group.

Use the **no** form of this command to delete specify group.

Example The following example shows how to create a MAC group with group ID 3.

```
Switch(config)# vlan mac-vlan group 333 22:33:44:55:66:77
                mask 48
```

2.16.2 vlan mac-vlan group(Interface)

Syntax	**vlan mac-vlan group** <1- 2147483647> **vlan** <1-4094> **no vlan mac-vlan [group** <1- 2147483647>**]**
Parameter	***<1-2147483647>*** Specify the group ID. (optional in no form) Delete all mapping group if not specify. ***<1-4094>*** Specify the VLAN ID to give to match packet.
Default	No mappings are configured.
Mode	Interface Configuration
Usage	Use the “**vlan mac-vlan group**” to create mapping of group and VLAN ID of an interface. Use the **no** form of this command to delete mapping.
Example	The following example shows how to mapping group id 333 to VLAN 100 on interface g 1.

```
Switch(config)# Interface g 1
Switch(config-if)# vlan mac-vlan group 333 VLAN 100
```

2.16.3 show vlan mac-vlan groups

Syntax	**show vlan mac-vlan groups**
Parameter	N/A
Default	N/A
Mode	Privileged EXEC
Usage	Use the **show vlan mac-vlan groups** command to display mac groups configuration
Example	This following example shows how to display mac group.

```
Switch# show vlan mac-vlan groups
```

2.16.4 show vlan mac-vlan interfaces

Syntax	**show vlan mac-vlan [interfaces** IF_PORTS**]**	
Parameter	IF_PORTS (Optional)	Specify interfaces mac vlan to display. Display all ports if not specify.
Default	N/A	
Mode	Privileged EXEC	
Usage	Use the show **vlan mac-vlan interface** command in EXEC mode to display the mac-vlan interfaces setting	
Example	The following example shows how to display the MAC-Based VLAN interfaces setting `Switch# show vlan mac-vlan interfaces g 1`	

2.17 Management ACL

2.17.1 management access-list

Syntax	**management access-list NAME** **no management access-list NAME**	
Parameter	**NAME**	The name of management ACL
Default	No management ACL is configured.	
Mode	Global Configuration	
Usage	Use the management **access-list** command to create a management access list and to enter management access-list configuration mode. The name of ACL must be unique that cannot have same name with other management ACL. Use the no form of this command to delete	
Example	The following example shows how to add a management ACL with name “test” `Switch(config)# management access-list test`	

2.17.2 management access-class

Syntax	**management access-class** NAME **no management access-class**
Parameter	**NAME** The name of management ACL to be used
Default	Default is no management ACL restrictions
Mode	Global Configuration
Usage	Use the **management access-class** command to activate a management ACL. Use the no form of this command to delete
Example	The following example shows how to add a management ACL with name "test" `Switch(config)# management access-list test`

2.17.3 deny

Syntax	**[sequence** <1-65535>**] deny interfaces** IF_PORTS **service (all|http|https|snmp|ssh|telnet)** **[sequence** <1-65535>**] deny ip** A.B.C.D/A.B.C.D **interfaces** IF_PORTS **service (all|http|https|snmp|ssh|telnet)** **[sequence** <1-65535>**] deny ipv6 X:X::X:X/<0-128> interfaces** IF_PORTS **service (all|http|https|snmp|ssh|telnet)**

Parameter

<1-65535>	Optional) Specify sequence index of ACL entry, the sequence index represent the priority of an entry in ACL. If not specified, the switch assigns a number from 1 in ascending order.
interfaces IF_PORTS	Specify the interface ID or a list of interface IDs.
ip A.B.C.D/A.B.C.D	Specify the source IP address and mask of packet.
ipv6 X:X::X:X/<0-128>	Specify the source IPv6 address and prefix length of packet.
(all|http|https|snmp|ssh|telnet)	Specify the type of services.

Default	No rules are configured.

Mode Management Access-List Configuration

Usage Use the deny command to add deny rules that drop those packets hit the rule.

Example The following example shows how to add a deny rule to drop all types of services packets that source ip is 1.1.1.1 from interface gi1.

```
Switch(config)# management access-list test
Switch(config-macl)# sequence 1 deny ip
 1.1.1.1/255.255.255.255 interfaces gi1 service all
```

2.17.4 permit

Syntax **[sequence** <1-65535>**] deny interfaces** IF_PORTS **service (all|http|https|snmp|ssh|telnet)**
[sequence <1-65535>**] deny ip** A.B.C.D/A.B.C.D **interfaces** IF_PORTS **service (all|http|https|snmp|ssh|telnet)**
[sequence <1-65535>**] deny ipv6 X:X::X:X/<0-128> interfaces** IF_PORTS**service (all|http|https|snmp|ssh|telnet)**

Parameter

<1-65535>	(Optional) Specify sequence index of ACL entry, the sequence index represent the priority of an entry in ACL. If not specified, the switch assigns a number from 1 in ascending order.
interfaces IF_PORTS	Specify the interface ID or a list of interface IDs.
ip A.B.C.D/A.B.C.D	Specify the source IP address and mask of packet.
ipv6 X:X::X:X/<0-128>	Specify the source IPv6 address and prefix length of packet.
(all|http|https|snmp|ssh|telnet)	Specify the type of services.

Default No rules are configured.

Mode Management Access-List Configuration

Usage Use the permit command to add deny rules that drop those packets hit the rule.

Example The following example shows how to add a permit rule to bypass http service packets that source ip is 2.2.2.2 from interface gi1.

```
Switch(config)# management access-list test
Switch(config-macl)# sequence 2 permit ip
                 2.2.2.2/255.255.255.255 interfaces gi1
                 service http
```

2.17.5 no sequence

Syntax	**no sequence** <1-65535>	
Parameter	<1-65535>	Specify sequence index of ACL entry to delete.
Default	No rules are configured.	
Mode	Management Access-List Configuration	
Usage	Use the **no sequence** command to delete an entry in management ACL.	

Example The following example shows how to delete an entry.

```
Switch(config)# management access-list test
Switch(config-macl)# sequence 10 deny interfaces gi1
                     service all
Switch(config-macl)# no sequence 10
```

2.17.6 show management access-class

Syntax	**show management access-class**
Parameter	N/A
Default	No default is defined
Mode	Privileged EXEC
Usage	Use the **show management access-class** command to show the active management access-list.
Example	The example shows how to show management access-class `Switch# show management access-class`

2.17.7 show management access-list

Syntax	**show management access-list** [NAME]
Parameter	NAME Specify the name of management ACL to displayed
Default	No default is defined
Mode	Privileged EXEC
Usage	Use the show management access-list command to show management ACL.
Example	The example shows how to show management access-list `Switch# show management access-list`

2.18 Mirror

2.18.1 mirror session destination interface

Syntax

mirror session <1-4> **destination interface** IF_NMLPORT **[allow-ingress]**
no mirror session <1-4> **destination interface** IF_NMLPORT
no mirror session (<1-4> **| all)**

Parameter

<1-4>	Specify the mirror session to configure
IF_NMLPORT	Specify the SPAN destination. A destination must be a physical port
allow-ingress	Enable ingress traffic forwarding.

Default

No monitor sessions are configured.

Mode

Global Configuration

Usage

Use the **"mirror session destination interface**" command to start a destination interface of a port mirror session.

Use the **no** form of this command to stop a destination interface of a port mirroring session.

Use the "**no mirror session**" command to disable all mirror sessions or specific mirror session.

Example

The following example shows how to create a local session 1 to monitor both sent and received traffic on source port g 1.

```
Switch(config)# mirror session 1 destination interface
                 g 1
Switch# show mirror session 1 Session 1 Configuration
Source RX
```

2.18.2 mirror session source interface

Syntax

mirror session <1-4> source interfaces IF_PORTS (both | rx | tx)
no mirror session <1-4> source interfaces IF_PORTS (both | rx | tx)
no mirror session (<1-4> | all)

Parameter

<1-4>	Specify the mirror session to configure
IF_PORTS	Specify the source interface, Valid interfaces include physical ports and port channels.
both	Mirror tx and rx direction
rx	Mirror rx direction only
tx	Mirror tx direction only

Default

No monitor sessions are configured.

Mode

Global Configuration

Usage

Use the “**mirror session source interface**” command to start a port mirror session.

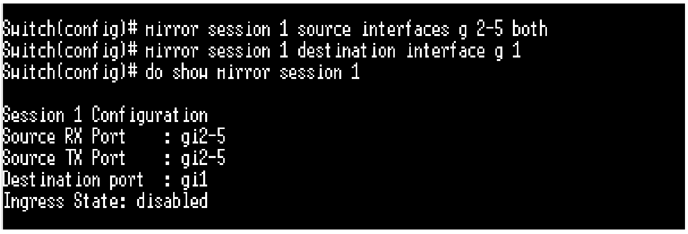
Use the **no** form of this command to stop a port mirroring session.

Use the “**no mirror session**” command to disable all mirror sessions or specific mirror session.

Example

The following example shows how to create a local SPAN session 1 to monitor both sent and received traffic on source port fa1.

```
Switch(config)# mirror session 1 source interface g 2-5
both Switch(config)# mirror session 1 destination
interface fa1 Switch(config)# show mirror session 1
```



```
Switch(config)# mirror session 1 source interfaces g 2-5 both
Switch(config)# mirror session 1 destination interface g 1
Switch(config)# do show mirror session 1

Session 1 Configuration
Source RX Port    : gi2-5
Source TX Port    : gi2-5
Destination port  : gi1
Ingress State: disabled
```

2.18.3 show mirror

Syntax	**show mirror [session <1-4>]**
Parameter	<1-4> Specify the mirror session to display
Default	N/A
Mode	Privileged EXEC
Usage	Use the show mirror command to display mirror session configuration
Example	This following example shows how to display mirror session configuration `Switch(config)# show mirror`

2.19 MLD Snooping

2.19.1 Ipv6 mld snooping

Syntax	**ipv6 mld / snooping no ipv6 / mld snooping**
Parameter	N/A
Default	Default is disabled
Mode	Global Configuration
Usage	Use the **ipv6 mld snooping** command to enable MLD snooping function. Use the **no** form of this command to disable. Disable will clear all ipv6 mld snooping dynamic group and dynamic router port, and make the static ipv6 mld group invalid. No more dynamic group and router port by mld message will be learned. You can verify settings by the **show ipv6 mld snooping** command.
Example	The following example specifies that set ipv6 mld snooping test. `Switch(config)# ipv6 mld snooping`

2.19.2 ipv6 mld snooping report-suppression

Syntax	**ipv6 mld snooping report-suppression** **no ipv6 mld snooping report-suppression**
Parameter	N/A
Default	Default is enabled
Mode	Global Configuration
Usage	Use the **ipv6 mld snooping** command to enable MLD snooping function. Use the **no** form of this command to disable. Disable will clear all ipv6 mld snooping dynamic group and dynamic router port, and make the static ipv6 mld group invalid. No more dynamic group and router port by mld message will be learned. You can verify settings by the **show ipv6 mld snooping** command.
Example	The following example specifies that disable ipv6 mld snooping report-suppression test. `Switch(config)# no ipv6 mld snooping report-suppression`

2.19.3 ipv6 mld snooping version

Syntax	**ipv6 mld snooping version (1|2)**
Parameter	(1|2) Ipv6 mld snooping running version 1 or 2
Default	Default is version 1
Mode	Global Configuration
Usage	Use the **ipv6 mld snooping version** command to change MLD support version. Version 2 packet won’t be processed if choose version 1. You can verify settings by the **show ip igmp snooping** command.

Example The following example specifies that disable ipv6 mld snooping report-suppression test.

Switch(config)# **no ipv6 mld snooping report-suppression**

2.19.4 ipv6 mld snooping unknown-multicast action

Syntax	**ipv6 mld snooping unknown-multicast action (drop | flood |router-port)** **no ipv6 mld snooping unknown-multicast action**	
Parameter	(drop | flood | router- port)	Drop、flood in vlan or forward to router port of unknown multicast packet
Default	Default is flood.	
Mode	Global Configuration	
Usage	When igmp and mld snooping disabled, it can't set action router-port. When disable igmp snooping & mld snooping, it set unknown multicast action flood. When action is router-port to flood or drop, it will delete the unknown multicast group entry. Use the **ipv6 mld snooping unknown-multicast action** command to change action. Use the **no** form of this command to restore to default. You can verify settings by the **show ipv6 mld snooping** command.	
Example	The following example specifies that set ipv6 mld unknown multicast action router-port test. `Switch(config)# ipv6 mld snooping unknown-multicast action router-port`	

2.19.5 ipv6 mld snooping vlan

Syntax	**ipv6 mld snooping vlan VLAN-LIST** **no ipv6 mld snooping vlan VLAN-LIST**	
Parameter	VLAN-LIST	specifies VLAN ID list to set
Default	Default is disabled for all VLANs	
Mode	Global Configuration	
Usage	Disable will clear all ipv6 mld snooping dynamic group and dynamic router port and make all static ip igmp group invalid of this vlan. Will not learn dynamic group and router port by igmp message any more. Use the **ipv6 mld snooping vlan** command to enable MLD on VLAN. Use the no form of this command to disable You can verify settings by the **show ipv6 mld snooping vlan** command.	
Example	The following example specifies that set ipv6 mld snooping vlan test. `Switch(config)# ipv6 mld snooping vlan 1`	

2.19.6 ipv6 mld snooping vlan parameters

Syntax

ipv6 mld snooping vlan <VLAN-LIST> last-member-query-count <1-7>
no ipv6 mld snooping vlan <VLAN-LIST> last-member-query-count
ipv6 mld snooping vlan <VLAN-LIST> last-member-query-interval <1-60>
no ipv6 mld snooping vlan <VLAN-LIST> last-member-query-interval
[no] ipv6 mld snooping vlan <VLAN-LIST> router learn pim-dvmrp
[no] ipv6 mld snooping vlan <VLAN-LIST> fastleave
ipv6 mld snooping vlan <VLAN-LIST> query-interval <30-18000>
no ipv6 mld snooping vlan <VLAN-LIST> query-interval
ipv6 mld snooping vlan <VLAN-LIST> response-time <5-20>
no ipv6 mld snooping vlan <VLAN-LIST> response-time
ipv6 mld snooping vlan <VLAN-LIST> robustness-variable <1-7>
no ipv6 mld snooping vlan <VLAN-LIST> robustness-variable

Parameter

VLAN-LIST	specifies VLAN ID list to set
last-member-query- count <1-7>	specifies last member query count to set. Default is 2
last-member-query- interval <1-60>	specifies last member query interval to set. Default is 1
query-interval <30-18000>	specifies query interval to set. Default is125
response-time <5-20>	specifies a response time to set. default is 10
robustness-variable <1-7>	specifies a robustness value to set, default is 2

Default

no ipv6 mld snooping vlan 1-4094 last-member-query-count no ipv6 mld snooping vlan 1-4094 last-member-query-interval ipv6 mld snooping vlan 1-4094 router learn pim-dvmrp
no ipv6 mld snooping vlan 1-4094 fastleave
no ipv6 mld snooping vlan 1-4094 query-interval no ipv6 mld snooping vlan 1-4094 response-time
no ipv6 mld snooping vlan 1-4094 robustness-variable

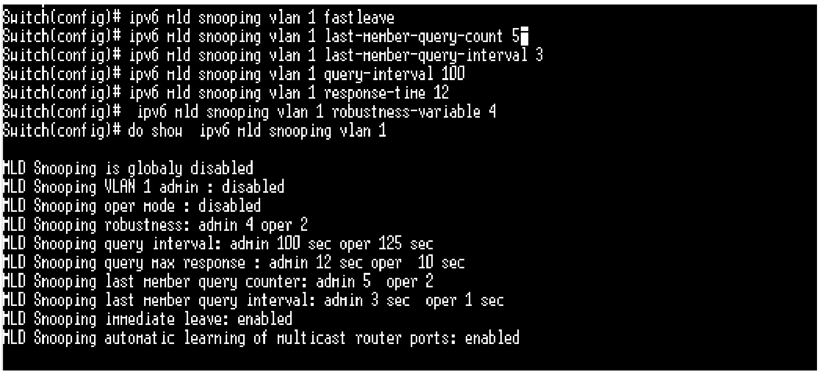
Mode Global Configuration

Usage 'no ipv6 mld snooping vlan 1 (last-member-query-count | last-member-query- interval | query-interval | response-time | robustness-variable)' will set the vlan parameters to default. The cli setting will change the ipv6 mld vlan parameters admin settings. The configure can use 'show ipv6 mld snooping vlan 1'.

Example The following example specifies that set ipv6 mld snooping vlan parameters test.

```
Switch(config)# ipv6 mld snooping vlan 1 fastleave
Switch(config)# ipv6 mld snooping vlan 1 last-member-
                 query-count 5
Switch(config)# ipv6 mld snooping vlan 1 last-member-
                 query-interval 3
Switch(config)# ipv6 mld snooping vlan 1 query-interval
```

```
                         100
Switch(config)# ipv6 mld snooping vlan 1 response-time 12
Switch(config)# ipv6 mld snooping vlan 1 robustness-
                         variable 4
Switch# show ipv6 mld snooping vlan 1
```



```
Switch(config)# ipv6 mld snooping vlan 1 fastleave
Switch(config)# ipv6 mld snooping vlan 1 last-member-query-count 5
Switch(config)# ipv6 mld snooping vlan 1 last-member-query-interval 3
Switch(config)# ipv6 mld snooping vlan 1 query-interval 100
Switch(config)# ipv6 mld snooping vlan 1 response-time 12
Switch(config)#  ipv6 mld snooping vlan 1 robustness-variable 4
Switch(config)# do show  ipv6 mld snooping vlan 1

MLD Snooping is globaly disabled
MLD Snooping VLAN 1 admin : disabled
MLD Snooping oper mode : disabled
MLD Snooping robustness: admin 4 oper 2
MLD Snooping query interval: admin 100 sec oper 125 sec
MLD Snooping query max response : admin 12 sec oper  10 sec
MLD Snooping last member query counter: admin 5  oper 2
MLD Snooping last member query interval: admin 3 sec  oper 1 sec
MLD Snooping immediate leave: enabled
MLD Snooping automatic learning of multicast router ports: enabled
```

2.19.7 ipv6 mld snooping vlan fastleave

Syntax

ipv6 mld snooping vlan <VLAN-LIST> fastleave
no ipv6 mld snooping vlan <VLAN-LIST> fastleave

Parameter

VLAN-LIST	specifies VLAN ID list to set

Default

Default is disabled

Mode

Global Configuration

Usage

Use the ipv6 mld snooping vlan fastleave command to enable fastleave function. Group will remove port immediately when receive leave packet. Use the no form of this command to disable.
You can verify settings by the show ipv6 mld snooping vlan command

Example

The following example specifies that set ipv6 mld snooping vlan fastleave test.

```
Switch(config)# ipv6 mld snooping vlan 1 fastleave
```

2.19.8 ipv6 mld snooping vlan last-member-query-count

Syntax

ipv6 mld snooping vlan <VLAN-LIST> last-member-query-count <1-7>
no ipv6 mld snooping vlan <VLAN-LIST> last-member-query-count

Parameter

VLAN-LIST	specifies VLAN ID list to set
last-member-query- count <1-7>	specifies last member query count to set

Default

Default is 2

Mode

Global Configuration

Usage

Use the ipv6 mld snooping vlan last-member-query-count command to change how many query packets will send.
Use the no form of this command to restore to default.
You can verify settings by the show ipv6 mld snooping vlan command

Example

The following example specifies that set ipv6 mld snooping vlan last-member-query-count test.

```
Switch(config)# ipv6 mld snooping vlan 1 last-member-query-count 5
```

2.19.9 ipv6 mld snooping vlan last-member-query-interval

Syntax

ipv6 mld snooping vlan <VLAN-LIST> last-member-query-interval <1- 60>
no ipv6 mld snooping vlan <VLAN-LIST> last-member-query-interval

Parameter

VLAN-LIST	specifies VLAN ID list to set
last-member-query- interval <1-60>	specifies last member query interval to set

Default

Default is 1

Mode

Global Configuration

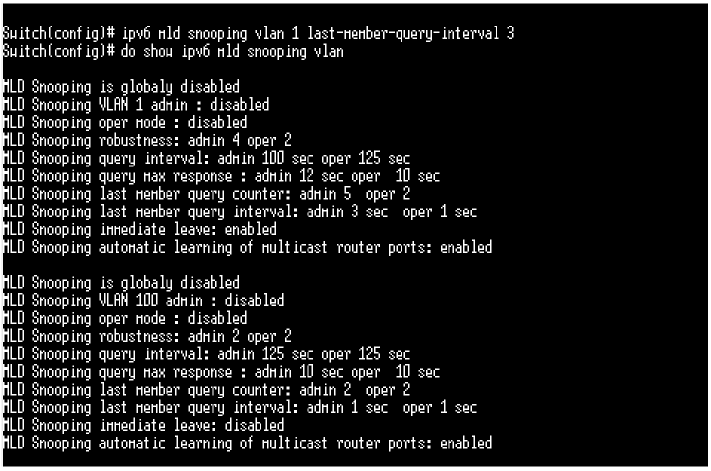
Usage

Use the **ipv6 mld snooping vlan last-member-query-interval** command to set interval between each query packet.
Use the no form of this command to restore to default
You can verify settings by the **show ipv6 mld snooping vlan** command

Example

The following example specifies that set ipv6 mld snooping vlan last-member-query-interval test.

```
Switch(config)# ipv6 mld snooping vlan 1 last-member-
                query-interval 3
```



```
Switch(config)# ipv6 mld snooping vlan 1 last-member-query-interval 3
Switch(config)# do show ipv6 mld snooping vlan

MLD Snooping is globaly disabled
MLD Snooping VLAN 1 admin : disabled
MLD Snooping oper mode : disabled
MLD Snooping robustness: admin 4 oper 2
MLD Snooping query interval: admin 100 sec oper 125 sec
MLD Snooping query max response : admin 12 sec oper  10 sec
MLD Snooping last member query counter: admin 5  oper 2
MLD Snooping last member query interval: admin 3 sec  oper 1 sec
MLD Snooping immediate leave: enabled
MLD Snooping automatic learning of multicast router ports: enabled

MLD Snooping is globaly disabled
MLD Snooping VLAN 100 admin : disabled
MLD Snooping oper mode : disabled
MLD Snooping robustness: admin 2 oper 2
MLD Snooping query interval: admin 125 sec oper 125 sec
MLD Snooping query max response : admin 10 sec oper  10 sec
MLD Snooping last member query counter: admin 2  oper 2
MLD Snooping last member query interval: admin 1 sec  oper 1 sec
MLD Snooping immediate leave: disabled
MLD Snooping automatic learning of multicast router ports: enabled
```

2.19.10 ipv6 mld snooping vlan query-interval

Syntax

ipv6 mld snooping vlan <VLAN-LIST> query-interval <30-18000>
no ipv6 mld snooping vlan <VLAN-LIST> query-interval

Parameter

VLAN-LIST	specifies VLAN ID list to set
query-interval <30-18000>	specifies query interval to set

Default

Default is 125

Mode

Global Configuration

Usage

Use the **ipv6 mld snooping vlan query-interval** command to set interval between each query.
Use the **no** form of this command to restore to default
You can verify settings by the **show ipv6 mld snooping vlan** command

Example

The following example specifies that set ipv6 mld snooping vlan query-interval test.

```
Switch(config)# ipv6 mld snooping vlan 1 query-interval
                 100
```

2.19.11 ipv6 mld snooping vlan response-time

Syntax

ipv6 mld snooping vlan <VLAN-LIST> response-time <5-20>
no ipv6 mld snooping vlan <VLAN-LIST> response-time

Parameter

VLAN-LIST	specifies VLAN ID list to set
Response-time <5-20>	specifies a response time to set

Default Default is 10

Mode Global Configuration

Usage

Use the ipv6 mld snooping vlan response-time command to set response time.
Use the no form of this command to restore to default.
You can verify settings by the show ipv6 mld snooping vlan command

Example

The following example specifies that set ipv6 mld snooping vlan response- time test.

```
Switch(config)# ipv6 mld snooping vlan 1 response-time
                12
```

2.19.12 ipv6 mld snooping vlan robustness-variable

Syntax

ipv6 mld snooping vlan <VLAN-LIST> robustness-variable <1-7>
no ipv6 mld snooping vlan <VLAN-LIST> robustness-variable

Parameter

VLAN-LIST	specifies VLAN ID list to set
robustness-variable <1-7>	specifies a robustness value to set

Default Default is 2

Mode Global Configuration

Usage

Use the **ipv6 mld snooping vlan robustness-variable** command to times to retry.
Use the no form of this command to restore to default
You can verify settings by the **show ipv6 mld snooping vlan** command

Example

The following example specifies that set ipv6 mld snooping vlan parameters test.

```
Switch(config)# ip igmp snooping vlan 1 robustness-
                variable
```

2.19.13 ipv6 mld snooping vlan router

Syntax

ipv6 mld snooping vlan VLAN-LIST router learn pim-dvmrp
no ipv6 mld snooping vlan VLAN-LIST router learn pim-dvmrp

Parameter

VLAN-LIST	specifies VLAN ID list to set

Default Default is enabled

Mode Global Configuration

Usage

Use the **ipv6 mld snooping vlan router** command to enable learning router port by routing protocol packets such as PIM/PIMv2, DVMRP, MOSPF. Use the **no** form of this command to disable.
You can verify settings by the **show ipv6 mld snooping vlan** command

Example

The following example specifies that set ipv6 mld snooping vlan router test.

```
Switch(config)# ipv6 mld snooping vlan 99 router
```

2.19.14 ipv6 mld snooping vlan static-port

Syntax

ipv6 mld snooping vlan <VLAN-LIST> static-port IF_PORTS
no ipv6 mld snooping vlan <VLAN-LIST> static-port IF_PORTS

Parameter

VLAN-LIST	specifies VLAN ID list to set
IF_PORTS	specifies a port list to set or remove

Default No static port by default

Mode Global Configuration

Usage

Use the ipv6 mld snooping vlan static-port command to add static forwarding port, all known vlan 1 ipv6 group will add the static ports.
Use the no form of this command to delete static port.
You can verify settings by the show ipv6 mld snooping forward-all command.

Example

The following example specifies that set ipv6 mld snooping static port test.

```
Switch(config)# ipv6 mld snooping vlan 1 static-port g
                1-2
```

2.19.15 ipv6 mld snooping vlan forbidden-router-port

Syntax

ipv6 mld snooping vlan <VLAN-LIST> forbidden-router-port IF_PORTS
no ipv6 mld snooping vlan <VLAN-LIST> forbidden-router-port IF_PORTS

Parameter

VLAN-LIST	specifies VLAN ID list to set
IF_PORTS	specifies a port list to set or remove

Default

No forbidden router ports by default

Mode

Global Configuration

Usage

Use the ipv6 mld snooping vlan forbidden-router-port command to add static forbidden router port. This will also remove port from static router port. The forbidden router port will not forward received query packet.
Use the no form of this command to delete forbidden router port.
You can verify settings by the show ipv6 mld snooping router command.

Example

The following example specifies that set ipv6 mld snooping forbidden test.

```
Switch(config)# ipv6 mld snooping vlan 1 forbidden
                    router-port gi2
```

2.19.16 ipv6 mld snooping vlan static router port

Syntax

ipv6 mld snooping vlan <VLAN-LIST> static-router-port IF_PORTS
no ipv6 mld snooping vlan <VLAN-LIST> static-router-port IF_PORTS

Parameter

VLAN-LIST	specifies VLAN ID list to set
IF_PORTS	specifies a port list to set or remove

Default

None static router ports by default

Mode

Global Configuration

Usage

Use the **ipv6 mld snooping vlan static-router-port** command to add static router port. All query packets will forward to this port.
Use the **no** form of this command to delete static router port.
You can verify settings by the show ipv6 mld snooping router command.

Example

The following example specifies that set ipv6 mld snooping static test.

```
Switch(config)# ipv6 mld snooping vlan 1 static-router-
port gi1-2
```

2.19.17 ipv6 mld snooping vlan static-group

Syntax **ipv6 mld snooping vlan <VLAN-LIST> static-group [<ipv6-addr>] interfaces IF_PORTS**
no ipv6 mld snooping vlan <VLAN-LIST> static-group <ipv6-addr> interfaces IF_PORTS

Parameter

VLAN-LIST	specifies VLAN ID list to set
Ipv6-addr	specifies multicast group ipv6 address
IF_PORTS	specifies port list to set or remove

Default No static group by default

Mode Global Configuration

Usage Use the ipv6 mld snooping vlan static-group command to add a static group. The static group will not learn other dynamic ports. If the dynamic group exists, then the static group will overlap the dynamic group. The static group set to valid unless igmp snooping global and vlan enable.

Use the no form of this command to delete a port in static group. If remove the last member of static group, the static group will be delete.

You can verify settings by the show ipv6 mld snooping group command.

Example The following example specifies that set ipv6 mld snooping static group test.

```
Switch(config)# ipv6 mld snooping vlan 1 static-group
                 ff13::1 interfaces gi1-2
```

2.19.18 ipv6 mld snooping vlan group

Syntax **no ipv6 mld snooping vlan <VLAN-LIST> group <ipv6-addr>**

Parameter

VLAN-LIST	specifies VLAN ID list to set
Ipv6-addr	specifies multicast group ipv6 address

Default None

Mode Global Configuration

Usage Use the **no ipv6 mld snooping vlan group** command to delete a group which could be static or dynamic.
You can verify settings by the show **ipv6 mld snooping group** command.

Example The following example specifies that set ip igmp snooping static group test.

```
Switch(config)# no ip igmp snooping vlan 1 group ff13::1
```

2.19.19 profile range

Syntax **profile range ipv6 <ipv6-addr> [ipv6-addr] action (permit | deny)**

Parameter

<ipv6-addr>	Start ipv6 multicast address
[ipv6-addr]	End ipv6 multicast address
(permit | deny)	Permit: allow Multicast address range ip address learning deny: do not allow Multicast address range ip address learning

Default None

Mode mld profile configuration mode

Usage Use the profile command to generate MLD profile.
You can verify settings by the show ipv6 mld profile command

Example The following example specifies that set ipv6 mld profile test.

```
Switch(config)# ipv6 mld profile 1
Switch(config-mld-profile)# profile range ipv6 ff13::1
                             ff13::10 action permit
```

2.19.20 ipv6 mld profile

Syntax **ipv6 mld profile <1-128> / no ipv6 mld profile <1-128>**

Parameter

<1-128>	specifies profile ID

Default No profie exist by default

Mode Global Configuration

Usage Use the **ipv6 mld profile** command to enter profile configuration Use the no form of this command to delete profile
You can verify settings by the **show ipv6 mld profile** command

Example The following example specifies that set ipv6 mld profile test.

```
Switch(config)# ipv6 mld profile 1
Switch(config-mld-profile)# profile range ipv6 ff13::1
                             ff13::10 action permit
```

2.19.21 ipv6 mld filter

Syntax **ipv6 mld filter <1-128> / no ipv6 mld filter**

Parameter

<1-128>	specifies profile ID
[interfaces IF_PORTS]	specifies interfaces to display

Default None

Mode Port Configuration

Usage Use the ipv6 mld filter command to bind a profile for port. When the port bind a profile. Then the port learning group will update, if the group is not match the profile rule it will remove the port from the group. Static group is excluded.
Use the no form of this command to delete profile
You can verify settings by the show ipv6 mld filter command

Example The following example specifies that set ipv6 mld filter test.

```
Switch(config)# interface gi1
Switch(config-if)# ipv6 mld filter 1
```

2.19.22 ipv6 mld max-groups

Syntax **ipv6 mld max-groups <0-1024> / no ipv6 mld max-groups**

Parameter

<1-128>	specifies profile ID

Default Default is 1024

Mode Port Configuration

Usage Use the **ipv6 mld max-groups** command to limit port learning max group number. When the port has reach limitation, new group will not add this port. Static group is excluded.
Use the **no** form of this command to restore to default
You can verify settings by the **show ipv6 mld max-groups** command.

Example The following example specifies that set ipv6 mld max-groups test.

```
Switch(config)# interface gi1
Switch(config-if)# ipv6 mld max-groups 10
```

2.19.23 ip igmp max-groups action

Syntax

ipv6 mld max-groups action (deny | replace)

Parameter

(deny | replace)	Deny: current port igmp group arrived max-groups,don't add group. Replace: current port igmp group arrived max-groups,remove port for rand group, and add port to new group.

Default

Default action is deny

Mode

Interface mode

Usage

Use the **ipv6 mld max-groups action** command to set the action when the numbers of groups reach the limitation.
Use the **no** form of this command to restore to default
You can verify settings by the **show ipv6 mld max-groups** command.

Example

The following example specifies that set action replace test.

```
Switch(config-if)#ipv6 mld max-groups action replace
```

2.19.24 clear ipv6 mld snooping groups

Syntax

clear ipv6 mld snooping groups [(dynamic | static)]

Parameter

None	Clear ipv6 mld groups include dynamic and static
(dynamic | static)	ipv6 mld group type is dynamic or static

Default

None

Mode

Privileged EXEC

Usage

This command will **clear the ipv6 mld groups** for dynamic or static or all of type.
You can verify settings by the **show ipv6 mld snooping groups** command.

Example

The following example specifies that clear ipv6 mld snooping groups test.

```
Switch# clear ipv6 mld snooping groups static
```

2.19.25 clear ipv6 mld snooping statistics

Syntax	**clear ipv6 mld snooping statistics**
Parameter	None
Default	None
Mode	Privileged EXEC
Usage	This command will clear the igmp statistics. You can verify settings by the **show ipv6 mld snooping** command.
Example	The following example specifies that clear ipv6 mld snooping statistics test. `Switch#` **`clear ipv6 mld snooping statistics`**

2.19.26 show ipv6 mld snooping groups counters

Syntax	**show ipv6 mld snooping groups counters**
Parameter	None
Default	None
Mode	Privileged EXEC
Usage	This command will display the ipv6 mld group counter include static group.
Example	The following example specifies that display ipv6 mld snooping group counter test. `Switch#` **`show ipv6 mld snooping group counters`**

2.19.27 show ipv6 mld snooping groups

Syntax **show ipv6 mld snooping groups [(dynamic | static)]**

Parameter

None	**Show ipv6 mld groups include dynamic and static**
(dynamic | static)	**Display ipv6 mld group type is dynamic or static**

Default display all ipv6 mld groups

Mode Privileged EXEC

Usage This command will display the ipv6 mld groups for dynamic or static or all of type.

Example The following example specifies that show ipv6 mld snooping groups test.

```
Switch# show ipv6 mld snooping groups
```

2.19.28 show ipv6 mld snooping router

Syntax **show ipv6 mld snooping router [(dynamic | forbidden |static)]**

Parameter

None	**Show ipv6 mld groups include dynamic and static**
(dynamic | forbidden | static)	**Display ipv6 mld router info for different type**

Default None

Mode Privileged EXEC

Usage This command will display the ipv6 mld router info.

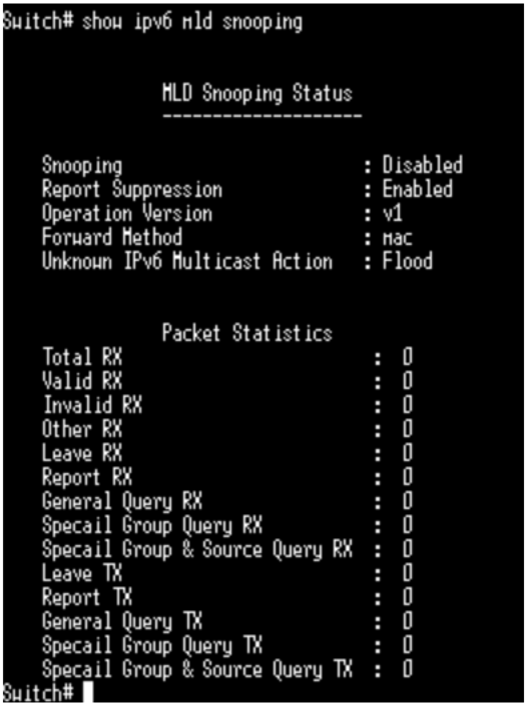
Example The following example specifies that show ipv6 mld snooping router test.

```
Switch# show ipv6 mld snooping router
```

2.19.29 show ipv6 mld snooping

Syntax	**show ipv6 mld snooping**
Parameter	None
Default	None
Mode	Privileged EXEC
Usage	This command will display ipv6 mld snooping global info.
Example	The following example specifies that show ipv6 mld snooping test.

```
Switch# show ipv6 mld snooping
```



```
Switch# show ipv6 mld snooping


                 MLD Snooping Status
                 --------------------

    Snooping                          : Disabled
    Report Suppression                : Enabled
    Operation Version                 : v1
    Forward Method                    : mac
    Unknown IPv6 Multicast Action     : Flood


                 Packet Statistics
    Total RX                           :  0
    Valid RX                           :  0
    Invalid RX                         :  0
    Other RX                           :  0
    Leave RX                           :  0
    Report RX                          :  0
    General Query RX                   :  0
    Specail Group Query RX             :  0
    Specail Group & Source Query RX    :  0
    Leave TX                           :  0
    Report TX                          :  0
    General Query TX                   :  0
    Specail Group Query TX             :  0
    Specail Group & Source Query TX    :  0
Switch#
```

2.19.30 show ipv6 mld snooping vlan

Syntax **show ipv6 mld snooping vlan [VLAN-LIST]**

Parameter

None	Show all ipv6 mld snooping vlan info
[VLAN-LIST]	Show specifies vlan ipv6 mld snooping info

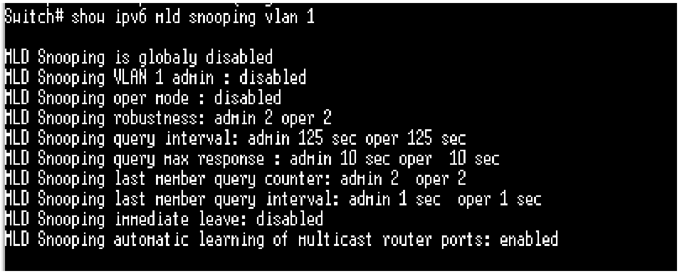
Default Show all ipv6 mld snooping vlan info

Mode Privileged EXEC

Usage This command will display ipv6 mld snooping vlan info.

Example The following example specifies that show ipv6 mld snooping test.

```
Switch# show ipv6 mld snooping vlan 1
```



```
Switch# show ipv6 mld snooping vlan 1

MLD Snooping is globaly disabled
MLD Snooping VLAN 1 admin : disabled
MLD Snooping oper mode : disabled
MLD Snooping robustness: admin 2 oper 2
MLD Snooping query interval: admin 125 sec oper 125 sec
MLD Snooping query max response : admin 10 sec oper  10 sec
MLD Snooping last member query counter: admin 2  oper 2
MLD Snooping last member query interval: admin 1 sec  oper 1 sec
MLD Snooping immediate leave: disabled
MLD Snooping automatic learning of multicast router ports: enabled
```

2.19.31 show ipv6 snooping forward-all

Syntax **show ipv6 mld snooping forward-all [vlan VLAN-LIST]**

Parameter

None	Show all ipv6 mld snooping vlan forward-all info
[VLAN-LIST]	Show specifies vlan of ipv6 mld forward info.

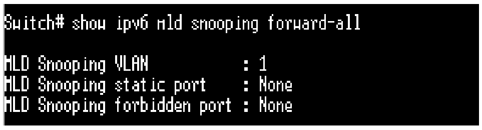
Default Show all vlan ipv6 mld forward all info

Mode Privileged EXEC

Usage This command will display ipv6 mld snooping forward all info.

Example The following example specifies that show ipv6 mld snooping forward-all test.

```
Switch# show ipv6 mld snooping forward-all
```



```
Switch# show ipv6 mld snooping forward-all

MLD Snooping VLAN           : 1
MLD Snooping static port    : None
MLD Snooping forbidden port : None
```

2.19.32 show ipv6 mld profile

Syntax **show ipv6 mld profile [<1-128>]**

Parameter

None	Show all ipv6 mld snooping profile info
[<1-128>]	Show specifies index profile info

Default Show all ipv6 mld profile info

Mode Privileged EXEC

Usage This command will display ipv6 mld profile info.

Example The following example specifies that show ipv6 mld profile test.

```
Switch# show ipv6 mld profile
```

2.19.33 show ipv6 mld filter

Syntax **show ipv6 mld filter [interfaces IF_PORTS]**

Parameter

None	Show all port filter
[interfaces IF_PORTS]	Show specifies ports filter

Default None

Mode Privileged EXEC

Usage This command will display ipv6 mld port filter info.

Example The following example specifies that show ipv6 mld filter test.

```
Switch# show ipv6 mld filter
```

2.19.34 show ipv6 mld max-group

Syntax **show ipv6 mld max-group [interfaces IF_PORTS]**

Parameter

None	Show all port max-group
[interfaces IF_PORTS]	Show specifies ports max-group

Default None

Mode Privileged EXEC

Usage This command will display ipv6 mld port max-group.

Example The following example specifies that show ipv6 mld max-group test.

```
Switch(config-if)# ipv6 mld max-groups 50
Switch# show ipv6 mld max-group
```

2.19.35 show ipv6 mld port max-group action

Syntax **show ipv6 mld max-group action [interfaces IF_PORTS]**

Parameter

None	Show all port max-group action
[interfaces IF_PORTS]	Show specifies ports max-group action

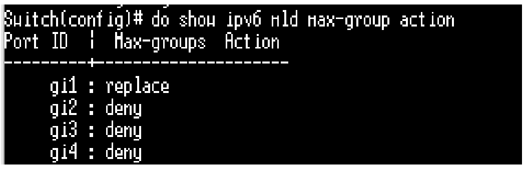
Default Show all ports ipv6 mld max-group action

Mode Privileged EXEC

Usage This command will display ipv6 mld port max-group action.

Example The following example specifies that show ipv6 mld max-group action test.

```
Switch(config-if)# ipv6 mld max-groups action replace
Switch# show ipv6 mld max-group action
```



```
Switch(config)# do show ipv6 mld max-group action
Port ID  |  Max-groups  Action
---------+----------------------
     gi1 : replace
     gi2 : deny
     gi3 : deny
     gi4 : deny
```

2.20 MVR

2.20.1 mvr

Syntax **mvr / no mvr**

Parameter None

Default Default is disabled

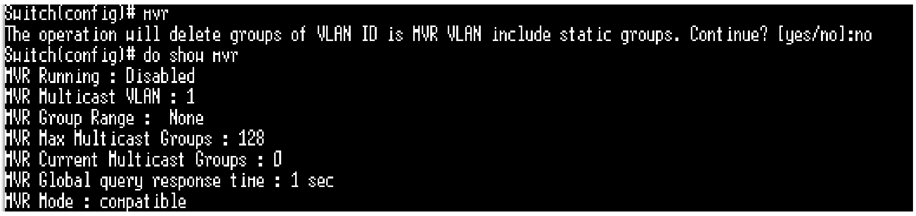
Mode Global Configuration

Usage Use the mvr command to enable MVR function. The command will clear all mvr VLAN ID multicast snooping group.

Use the **no** form of this command to disable. Disable will clear all mvr group. You can verify settings by the **show mvr** command.

Example The following example specifies that set mvr test.

```
Switch(config)# mvr
Switch(config)# no mvr
Switch# show mvr
```



```
Switch(config)# mvr
The operation will delete groups of VLAN ID is MVR VLAN include static groups. Continue? [yes/no]:no
Switch(config)# do show mvr
MVR Running : Disabled
MVR Multicast VLAN : 1
MVR Group Range :  None
MVR Max Multicast Groups : 128
MVR Current Multicast Groups : 0
MVR Global query response time : 1 sec
MVR Mode : compatible
```

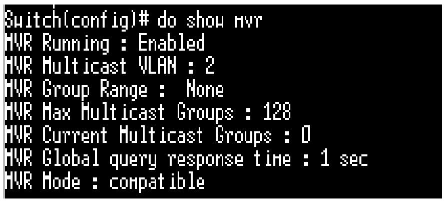
2.20.2 mvr vlan

Syntax	**mvr vlan <VLAN-ID>**
Parameter	<VLAN-ID> The exist static vlan id
Default	Default mvr vlan id is 1
Mode	Global Configuration
Usage	Use the **mvr vlan** command to modify mvr vlan id when the mvr status is enabled. Change mvr vlan id will delete the old mvr vlan and new mvr vlan group. If there have configure source or receiver port, there will check the source must only in the mvr vlan , and receiver port must not in the mvr vlan member. You can verify settings by the **show mvr** command.

Example

The following example specifies that configure mvr vlan 2 test.

```
Switch(config)# vlan 2
Switch(config)# mvr
The operation will delete groups of VLAN ID is MVR VLAN
include static groups. Continue? [yes/no]:y
Switch(config)# mvr vlan 2
The operation will delete the old and new MVR VLAN
groups include static MVR groups.Continue? [yes/no]:y
Switch# show mvr
```



```
Switch(config)# do show mvr
MVR Running : Enabled
MVR Multicast VLAN : 2
MVR Group Range :  None
MVR Max Multicast Groups : 128
MVR Current Multicast Groups : 0
MVR Global query response time : 1 sec
MVR Mode : compatible
```

2.20.3 mvr group

Syntax **mvr group <ip-address> [<1-128>]**

Parameter

< ip-address>	**Start MVR IP multicast address**
[<1-128>]	**Contiguous series of IP addresses.**

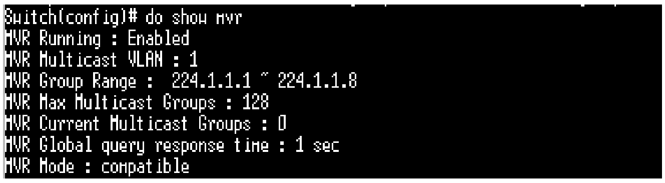
Default None

Mode Global Configuration

Usage Use the mvr group command to configure mvr group address range when mvr is enabled. The command will delete all mvr vlan ipv4 group entry You can verify settings by the **show mvr** command

Example The following example specifies that set mvr group range is 224.1.1.1 ~ 224.1.1.8 test.

```
Switch(config)# mvr
Switch(config)# mvr group 224.1.1.1 8
The operation will delete the MVR VLAN groups include
static MVR groups.Continue? [yes/no]:y
Switch# show mvr
```



```
Switch(config)# do show mvr
MVR Running : Enabled
MVR Multicast VLAN : 1
MVR Group Range :  224.1.1.1 ~ 224.1.1.8
MVR Max Multicast Groups : 128
MVR Current Multicast Groups : 0
MVR Global query response time : 1 sec
MVR Mode : compatible
```

2.20.4 mvr mode

Syntax **mvr mode (dynamic | compatible)**

Parameter

(dynamic|compatible)	**dynamic: Allows dynamic MVR membership on source ports** **compatible: does not support IGMP dynamic joins on source ports.**

Default Default is compatible.

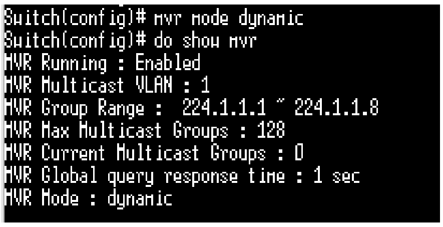
Mode Global Configuration

Usage Use the mvr mode command to change mvr mode when mvr is enabled.

You can verify settings by the show mvr command.

Example The following example specifies that set mvr mode dynamic test.

```
Switch(config)#mvr
Switch(config)#mvr mode dynamic
Switch# show mvr
```



```
Switch(config)# mvr mode dynamic
Switch(config)# do show mvr
MVR Running : Enabled
MVR Multicast VLAN : 1
MVR Group Range :  224.1.1.1 ~ 224.1.1.8
MVR Max Multicast Groups : 128
MVR Current Multicast Groups : 0
MVR Global query response time : 1 sec
MVR Mode : dynamic
```

2.20.5 mvr query-time

Syntax

mvr query-time <1-10> / no mvr query-time

Parameter

<1-10>	specifies query response time is 1~10 sec.

Default

Default is 1 sec

Mode

Global Configuration

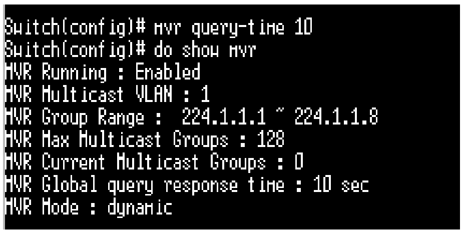
Usage

Use the **mvr query-time** command to configure when mvr is enabled. Use the no form of this command to set query-time default value. You can verify settings by the **show mvr** command.

Example

The following example specifies that set mvr query-time 10 sec test.

```
Switch(config)# mvr
Switch(config)# mvr query-time 10
Switch# show mvr
```



```
Switch(config)# mvr query-time 10
Switch(config)# do show mvr
MVR Running : Enabled
MVR Multicast VLAN : 1
MVR Group Range :  224.1.1.1 ~ 224.1.1.8
MVR Max Multicast Groups : 128
MVR Current Multicast Groups : 0
MVR Global query response time : 10 sec
MVR Mode : dynamic
```

2.20.6 mvr port type

Syntax **mvr type (source | receiver) / no mvr type**

Parameter

(source | receiver)	Source: Configure uplink ports that receive and send multicast data as source ports. Subscribers cannot be directly connected to source ports. All source ports on a switch belong to the single multicast VLAN. Receiver: Configure a port as a receiver port if it is a subscriber port and should only receive multicast data. It does not receive data unless it becomes a member of the multicast group, either statically or by using IGMP leave and join messages. Receiver ports cannot belong to the multicast VLAN.

Default None

Mode Port Configuration

Usage

Use the **mvr type** command to configure mvr port type when mvr is enabled.

The source port must only belong to mvr vlan. The receiver port must not belong to mvr vlan, and port mode must be access mode.

Use the **no** form of this command to set mvr type none

You can verify settings by the **show mvr interface** command

Example

The following example specifies that set gi1 is source port , gi2 is receiver port test.

```
Switch(config)# vlan 2
Switch(config-vlan)#exit
Switch(config)# mvr
Switch(config)# mvr vlan 2
Switch(config)# mvr group 224.1.1.1 8
Switch(config)# interface gi1
Switch(config-if)# switchport trunk allowed vlan 2
Switch(config-if)# mvr type source Switch(config-
                         if)#exit
Switch(config)# interface gi2
Switch(config-if)# switchport mode access
Switch(config-if)# mvr type receiver Switch# show mvr
                       interface
```

2.20.7 mvr port immediate

Syntax	**mvr immediate / no mvr immediate**
Parameter	None
Default	Default is disabled
Mode	Port Configuration
Usage	Use the **mvr immediate** command to configure mvr support immediate leave when mvr is enabled. **Note** This command applies to only receiver ports and should only be enabled on receiver ports to which a single receiver device is connected. Use the **no** form of this command to disable immediate leave. You can verify settings by the **show mvr interface** command

Example	The following example specifies that set gi2 immediate enable test. The configure should configure mvr receiver port firstly.(eg. mvr port type)
	`Switch(config)# interface gi2`
	`Switch(config-if)#mvr immediate`
	`Switch(config-if)#exit`
	`Switch(config)# exit`
	`Switch# show mvr interface`

2.20.8 mvr static group

Syntax **mvr vlan <VLAN-ID> group <ip-addr> interfaces IF_PORTS no mvr vlan < VLAN-ID> group <ip-addr> interfaces IF_PORTS**

Parameter

VLAN-ID	specifies MVR VLAN ID for static group
ip-addr	specifies multicast MVR group address
IF_PORTS	specifies port list to set or remove

Default None

Mode Global Configuration

Usage Use the **mvr vlan group** command to add a static group or configure static group member ports when mvr is enabled.

This command applies to only receiver ports.

In compatible mode, this command applies to only receiver ports. In dynamic mode, it applies to receiver ports and source ports.

When remove static mvr group all ports, the static group will be delete.

Or can use **no ip igmp vlan VLAN-ID group** to delete the mvr static group.

Static group can’t learn dynamic port by igmp memesage.

Use the **no** form of this command to delete a port in static group. If remove the last member of static group, the static group will be delete.

You can verify settings by the **show mvr members** command.

Example The following example specifies that set mvr static group test.

The configure must configure mvr receiver port firstly.(eg. mvr port type)

```
Switch(config)# mvr vlan 2 group 224.1.1.1 interfaces
                 gi2
Switch# show mvr members
```

2.20.9 clear mvr members

<table>
<tr><td><b>Syntax</b></td><td colspan="2"><b>clear mvr members [dynamic|static]</b></td></tr>
<tr><td rowspan="2"><b>Parameter</b></td><td>dynamic</td><td>specifies MVR dynamic group</td></tr>
<tr><td>static</td><td>specifies MVR static group</td></tr>
<tr><td><b>Default</b></td><td colspan="2">Clear all of mvr group</td></tr>
<tr><td><b>Mode</b></td><td colspan="2">Privileged EXEC</td></tr>
<tr><td><b>Usage</b></td><td colspan="2">This command will clear the mvr groups for selected type.</td></tr>
<tr><td><b>Example</b></td><td colspan="2">The following example specifies that clear all mvr groups test.
<code>Switch# <b>clear mvr members</b></code></td></tr>
</table>

2.20.10 show mvr members

Syntax	**show mvr members**
Parameter	None
Default	None
Mode	Privileged EXEC
Usage	This command will display the mvr groups for all of type.
Example	The following example specifies that show mvr groups test. `Switch# show mvr members`

2.20.11 show mvr interface

Syntax	**show mvr interface [IF_PORTS]**	
Parameter	IF_PORTS	Show specifies port list configuration
Default	None	
Mode	Privileged EXEC	
Usage	This command will display mvr port type and port immediate status.	
Example	The following example specifies that show mvr interface test. `Switch# show mvr interface`	

2.20.12 show mvr

Syntax	**show mvr**
Parameter	None
Default	None
Mode	Privileged EXEC
Usage	This command will display mvr global information.
Example	The following example specifies that show mvr test. `Switch# show mvr`

2.21 Port

2.21.1 back-pressure

Syntax **back-pressure / back-pressure**

Parameter None

Default Default back pressure state is enabled.

Mode Interface Configuration

Usage Use “**back-pressure**” command to make port to enable back pressure feature.

Use **no** form of this command to disable back pressure feature.

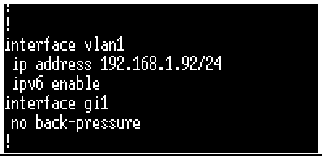
The only way to show this configuration is using “**show running-config**” command.

Example This example shows how to configure port g1 and g2 to be protected port.

```
Switch(config)# interface g 1
Switch(config-if)# no back-pressure
```

This example shows how to show current jumbo-frmae size

```
Switch# show running-config interface g 1
```



```
!
interface vlan1
 ip address 192.168.1.92/24
 ipv6 enable
interface gi1
 no back-pressure
!
```

2.21.2 clear interface

Syntax **clear interfaces** IF_PORTS **counters**

Parameter IF_PORTS Specify port to clear counters.

Default No default value for this command.

Mode Privileged EXEC

Usage Use “**clear interface**” command to clear statistic counters on specific ports.

Example This example shows how to clear counters on port fa1.

```
Switch(config)# clear interfaces g 1 counters
```

This example shows how to show current counters

```
Switch# show interfaces g 1
```

2.21.3 description

Syntax **description** WORD<1-32>
no description

Parameter WORD<1-32> Specifiy port description string.

Default Default port description is empty.

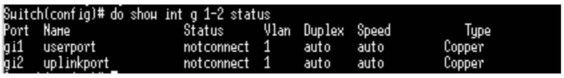
Mode Interface Configuration

Usage Use “**description**” command to give the port a name to identify it easily.

If description includes space character, please use double quoted to wrap it. Use **no** form to restore description to empty string.

Example This example shows how to modify port descriptions.

```
Switch(config)# interface g 1
Switch(config-if)# description userport
Switch(config-if)# exit
Switch(config)# interface g 2
Switch(config-if)# description “uplink port”
```



```
Switch(config)# do show int g 1-2 status
Port  Name               Status     Vlan  Duplex  Speed       Type
gi1   userport           notconnect 1     auto    auto       Copper
gi2   uplinkport         notconnect 1     auto    auto       Copper
```

2.21.4 duplex

Syntax **duplex (auto | full | half)**

Parameter

auto	Specify port duplex to auto negotiation.
full	Specify port duplex to force full duplex
half	Specify port duplex to force half duplex

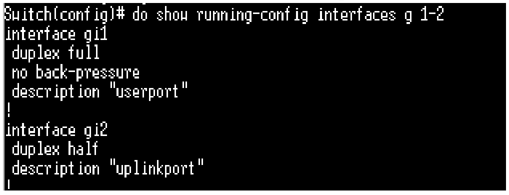
Default Default port duplex is auto.

Mode Interface Configuration

Usage Use “**duplex**” command to change port duplex configuration.

Example This example shows how to modify port duplex configuration.

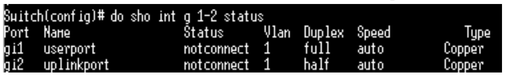
```
Switch(config)# interface g 1
Switch(config-if)# duplex full
Switch(config-if)# exit
Switch(config)# interface g 2
Switch(config-if)# duplex half
```



```
Switch(config)# do show running-config interfaces g 1-2
interface gi1
 duplex full
 no back-pressure
 description "userport"
!
interface gi2
 duplex half
 description "uplinkport"
!
```

This example shows how to show current interface link speed

```
Switch# show interfaces g 1-2 status
```



```
Switch(config)# do sho int g 1-2 status
Port  Name              Status      Vlan  Duplex  Speed        Type
gi1   userport          notconnect  1     full    auto       Copper
gi2   uplinkport        notconnect  1     half    auto       Copper
```

2.21.5 eee

Syntax **eee / no eee**

Parameter None

Default Default eee state is disabled.

Mode Interface Configuration

Usage Use “**eee**” command to make port to enable the energy efficient Ethernet feature.

Use no form of this command to disable eee.

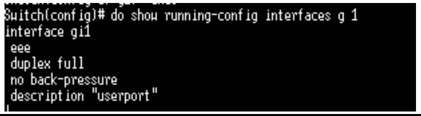
The only way to show this configuration is using “**show running-config**” command.

Example This example shows how to configure port fa1 and fa2 to be protected port.

```
Switch(config)# interface g 1
Switch(config-if)# eee
```

This example shows how to show current jumbo-frmae size

```
Switch# show running-config interface g 1
```



```
Switch(config)# do show running-config interfaces g 1
interface gi1
 eee
 duplex full
 no back-pressure
 description "userport"
!
```

2.21.6 flowcontrol

Syntax **flowcontrol (auto | off | on) / no flowcontrol**

Parameter

auto	Automatically enables or disables flow control on the interface.
off	Disable port flow control.
on	Enable port flow control.

Default Default port flow control is off.

Mode Interface Configuration

Usage Use "**flowcontrol**" command to change port flow control configuration.

Use **no** form to restore flow control to default (off) configuration.

Example This example shows how to modify port duplex configuration.

```
Switch(config)# interface g 1
Switch(config-if)# flowcontrol on
```

This example shows how to show current flow control configuration

```
Switch# show interfaces g 1
```

2.21.7 jumbo-frame

Syntax **jumbo-frame** <1518-9216>

Parameter <1518-9216> Specify the maximum frame size.

Default Default maximum frame size is 1522.

Mode Global Configuration

Usage Use "**jumbo-frame**" command to modify maximum frame size.
The only way to show this configuration is using "**show running-config**" command.

Example This example shows how to modify maximum frame size on fa1 to 9216 bytes.

```
Switch(config)# jumbo-frame 9216
```

This example shows how to show current jumbo-frmae size

```
Switch# show running-config
```

2.21.8 media-type

Syntax

media-type (auto-select | rj45 | sfp)
no media-type

Parameter

Auto-select	Select media automatically
Rj45	Select copper media
Sfp	Select fiber media

Default

Default media type is auto.

Mode

Interface Configuration

Usage

Use “**media-type**” command to change combo port media type.

Use **no** form of this command to restore media type to default.

Example

This example shows how to modify combo port media type to copper.

```
Switch(config)# interface gi1
Switch(config-if)# media-type rj45
```

2.21.9 protected

Syntax

protected / no protected

Parameter

Default protected state is no protected.

Default

Default media type is auto.

Mode

Interface Configuration

Usage

Use “**protected**” command to make port to be protected. Protected port is only allowed to communicate with unprotected port. In other words, protected port is not allowed to communicate with another protected port.

Use **no** form to make port unprotected.

Example

This example shows how to configure port fa1 and fa2 to be protected port.

```
Switch(config)# interface range fa1-2
Switch(config-if-range)# protected
```

This example shows how to show current protected port state.

```
Switch# show interfaces fa1-2 protected
```

2.21.10 show interface

Syntax

show interfaces IF_PORTS
show interfaces IF_PORTS status
show interfaces IF_PORTS potected

Parameter

IF_PORTS	Specifiy port to show.

Default

No default value for this command.

Mode

Privileged EXEC

Usage

Use “**show interface**” command to show detail port counters, parameters and status.

Use “**show interface status**” command to show brief port status. Use “**show interface protected**” command to show protected status.

Example

This example shows how to show current counters

```
Switch# show interfaces g 1
```

This example shows how to show current protected port state.

```
Switch# show interfaces fa1-2 protected
```

```
This example shows how to show current port status
Switch# show interfaces fa1-2 status
```

2.21.11 speed

Syntax

speed (10 | 100 | 1000)
speed auto [(10 | 100 | 1000 | 10/100)]

speed negotiate
no speed negotiate

Parameter

10	Specify port speed to force 10Mbits/s or auto with 10Mbits/s ability.
100	Specify port speed to force 100Mbits/s or auto with 100Mbits/s ability.
1000	Specify port speed to force 1000Mbits/s or auto with 1000Mbits/s ability.
10/100	Specify port speed to auto with 10Mbits/s and 100Mbits/s

Default Default port speed is auto with all available abilities.

Mode Interface Configuration

Usage Use “speed” command to change port speed configuration. The speed is only able to configure to the physical maximum speed. For example, in fast Ethernet port, speed 1000 is not available.

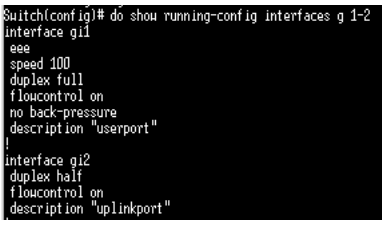
You cannot configure the speed on the SFP module ports, but you can configure the speed to not negotiate (nonegotiate) if it is connected to a device that does not support autonegotiation.

Example This example shows how to modify port speed configuration.

```
Switch(config)# interface g 1
Switch(config-if)# speed 100
Switch(config-if)# exit
Switch(config)# interface g 2
Switch(config-if)# speed auto
```

This example shows how to show current speed configuration

```
Switch# show running-config interfaces g 1-2
```



```
Switch(config)# do show running-config interfaces g 1-2
interface gi1
 eee
 speed 100
 duplex full
 flowcontrol on
 no back-pressure
 description "userport"
!
interface gi2
 duplex half
 flowcontrol on
 description "uplinkport"
```

2.21.12 shutdown

Syntax **shutdown / no shutdown**

Parameter None

Default Default port admin state is no shutdown.

Mode Interface Configuration

Usage Use “shutdown” command to disable port and use “no shutdown” to enable port. If port is error disabled by some reason, use “no shutdown” command can also recovery the port manually.

Example This example shows how to modify port duplex configuration.

```
Switch(config)# interface g 1
Switch(config-if)# shutdown
```

This example shows how to show current admin state configuration

```
Switch# show running-config interfaces g 1
```

2.22 Port Error Disbale

2.22.1 errdisable recovery cause

Syntax

errdisable recovery cause (all|acl|arp inspection| bpduguard| broadcast- flood|dhcp-rate-limit|psecure-violation |selfloop |unicast-flood|unknown-multicastflood)
no errdisable recovery cause (all|acl|arp-inspection |bpduguard |broadcast- flood|dhcp-rate-limit|psecure-violation |selfloop |unicast-flood|unknown- multicastflood)

Parameter

all	Enable the auto recovery for port error disabled from all causes.
acl	Enable the auto recovery for port error disabled from the ACL cause.
arp-inspection	Enable the auto recovery for port error disabled from the ARP inspection cause.
bpduguard	Enable the auto recovery for port error disabled from the STP BPDU Guard cause.
broadcast-flood	Enable the auto recovery for port error disabled from the broadcast flooging cause.
dhcp-rate-limit	Enable the auto recovery for port error disabled from the DHCP rate limit cause.
psecure-violation	Enable the auto recovery for port error disabled from the port security cause.
selfloop	Enable the auto recovery for port error disabled from the STP self-loop cause.
unicast-flood	Enable the auto recovery for port error disabled from the unicast flooding cause.
unknown-multicastflood	Enable the auto recovery for port error disabled from the unknown multicast flooding cause.

Default Error disable recovery is disabled for all cause.

Mode Global Configuration

Usage Ports would be disabled because of the invalid actions detected by protocols.

To enable the port error disable recovery from the specific cause, use the command errdisable recovery cause in the Global Configuration mode.

Example The following example enables the port error disable recovery for the STP BPDU Guard and self-loog cause.

```
Switch(config)# errdisable recovery cause bpduguard
Switch(config)# errdisable recovery cause selfloop
```

2.22.2 errdisable recovery interval

Syntax **errdisable recovery interval seconds**

Parameter

seconds	The time in seconds to recover from a specific error-disable state. The vaild range is 0 to 86400 seconds, and the default value is 300 seconds.

Default The default recovery time is 300 seconds.

Mode Global Configuration

Usage To set the recovery time of the error disabled ports, use the command errdisable recovert interval in the Global Configuration mode.

Example The following example set the agimg time to 500 seconds.

```
Switch(config)# errdisable recovery interval 60
```

2.22.3 show errdisable recovery

Syntax **show errdisable recovery**

Parameter N/A

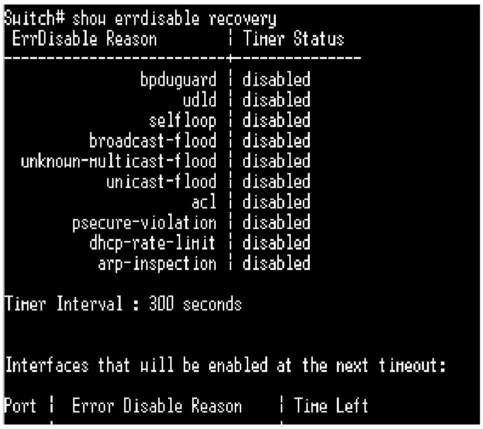
Default N/A

Mode Privileged EXEC

Usage To show the error disable configuration and the interfaces in the error disabled state, use the command **show errdisable recovery** in the Privileged EXEC mode.

Example The following example shows the error disable configuration, and the interfaces in the error disabled state.

```
Switch# show errdisable recovery
```



```
Switch# show errdisable recovery
 ErrDisable Reason          | Timer Status
----------------------------+--------------
                  bpduguard | disabled
                       udld | disabled
                   selfloop | disabled
            broadcast-flood | disabled
    unknown-multicast-flood | disabled
               unicast-flood | disabled
                        acl | disabled
           psecure-violation | disabled
            dhcp-rate-limit | disabled
             arp-inspection | disabled

Timer Interval : 300 seconds


Interfaces that will be enabled at the next timeout:

Port |  Error Disable Reason     | Time Left
```

2.23 Port Security

2.23.1 port security (Global)

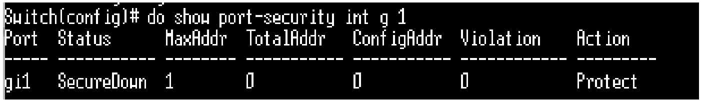
Syntax	**port-security / no port-security**
Parameter	N/A
Default	Default is disabled
Mode	Global Configuration
Usage	The “**port-security**” command enables the port security functionality globally. Use the **no** form of this command to disable. You can verify settings by the *show port-security* command.

Example	The following example shows how to enable port security
	`switch(config)# port-security`
	`switch# show port-security`

2.23.2 port-security(Interface)

Syntax	**port-security / no port-security**
Parameter	N/A
Default	Default is disabled
Mode	Port Configuration
Usage	The “**port-security**” command enables the port security functionality on this port. Use the **no** form of this command to disable You can verify settings by the **show port-security interface** command.

Example	The following example shows how to enable port security on interface g 1
	`switch(config)# interface g 1`
	`switch(config-if)# port-security`
	`switch(config)# show port-security interfaces g 1`



```
Switch(config)# do show port-security int g 1
Port  Status      MaxAddr  TotalAddr   ConfigAddr  Violation    Action
----- ----------- -------- ----------- ----------- ------------ ---------
gi1   SecureDown  1        0           0           0            Protect
```

2.23.3 port-security address-limit

Syntax

port-security address-limit <1-256> action (forward |discard | shutdown)
no port-security address-limit

Parameter

<1-256>	The learning-limit number. It specifies how many MAC addresses this port can learn.
forward	Forward this packet whose SMAC is new to system and exceed the learning-limit number.
discard	Discard this packet whose SMAC is new to system and exceed the learning-limit number.
shutdown	Shutdown this port when receives a packet whose SMAC is new to system and exceed the learning limit number.

Default

The address-limit default is 1 and action is "drop".

Mode

Port Configuration

Usage

Use the "**port-security address-limit**" command to set the learning-limit number and the violation action.
Use the **no** form of this command to restore the default settings.
You can verify settings by the s**how port-security interface** command.

Example

The following example shows how to enable port security on port 1 and set the learning limit number to 10.

```
switch(config)# interface g 1
switch(config-if)# port-security address-limit 10
                     action discard
switch(config-if)# port-security
switch(config)# show port-security interfaces g 1
```

2.23.4 show port-security

Syntax	**show port-security**
Parameter	N/A
Default	No default value for this command.
Mode	Privileged EXEC
Usage	Use “show port-security” command to show port-security global information.
Example	This example shows how to show port-security configurations. `Switch# show port-security`

2.23.5 show port-security interface

Syntax	**show port-security interface** IF_PORTS
Parameter	IF_PORTS Select port to show port-security configurations.
Default	No default value for this command.
Mode	Privileged EXEC
Usage	Use “**show port-security interfaces**” command to show port-security information of the specified port.
Example	This example shows how to show port-security configurations on interface g 1. `Switch# show port-security interfaces fa1`

2.24 Protocol VLAN

2.24.1 vlan protocol-vlan group (Global)

Syntax

vlan protocol-vlan group <1-8> **frame-type** (ethernet_ii|llc_other|snap_1042) **protocol-value** VALUE

no vlan protocol-vlan group <1-8>

Parameter

<1-8>	Specify protocol vlan group to configure
(ethernet_ii |llc_other|snap_1042)	Specify protocol based frame type
VALUE	Specify protocol value to configure

Default

no protocol vlan group are configured

Mode

Global Configuration

Usage

Use the **vlan protocol-vlan group** Global Configuration mode command to add protocol vlan group with spefied proto type and value.

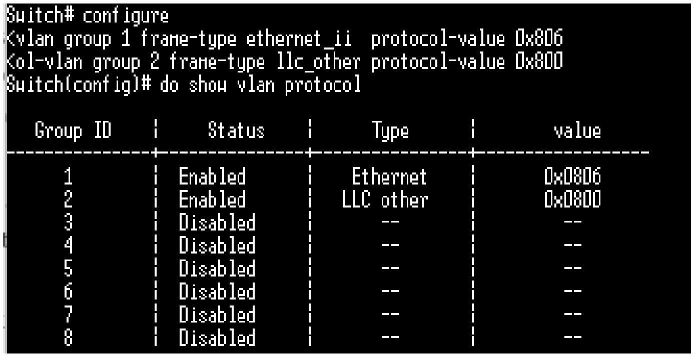
Use the **no** form of this command to remove protocol vlan group setting.

You can verify your setting by entering the **show vlan proto-vlan Privileged** EXEC command

Example

The following example show how to configure protocol vlan group:

```
Switch(config)# vlan protocol-vlan group 1 frame-type
ethernet_ii protocol-value 0x806
Switch(config)# vlan protocol-vlan group 2 frame-type
llc_other protocol- value 0x800
Switch# show vlan protocol-vlan
```



```
Switch# configure
<vlan group 1 frame-type ethernet_ii  protocol-value 0x806
<ol-vlan group 2 frame-type llc_other protocol-value 0x800
Switch(config)# do show vlan protocol

   Group ID    |     Status     |      Type      |      value
---------------+----------------+----------------+-----------------
       1       |  Enabled       |   Ethernet     |     0x0806
       2       |  Enabled       |  LLC other     |     0x0800
       3       |  Disabled      |      --        |       --
       4       |  Disabled      |      --        |       --
       5       |  Disabled      |      --        |       --
       6       |  Disabled      |      --        |       --
       7       |  Disabled      |      --        |       --
       8       |  Disabled      |      --        |       --
```

2.24.2 vlan protocol-vlan group (Interface)

Syntax

vlan protocol-vlan group <1-8> **vlan** <1-4094>
no vlan protocol-vlan group <1-8>

Parameter

<1-8>	Specify protocol vlan group to binding
<1-4094>	Specifies the Proto VLAN ID to configure.

Default

In default all group are not binding to any interface.

Mode

Interface configuration

Usage

Use the **vlan protocol-vlan binding** Interface Configuration mode command to binding protocol VLAN Group on specified interfaces, Use the no form of this command to cancel protocol VLAN Group Binding. You can verify your setting by entering the **show vlan protocol-vlan interfaces IF_PORTS Privileged EXEC** command

Example

The following example how to configure Protocol VLAN function on specified interfaces..

```
Switch(config)# interface g 1
Switch(config-if)# vlan protocol-vlan group 1 vlan 2
Switch(config-if)# vlan protocol-vlan group 2 vlan 3
Switch# show vlan protocol-vlan interfaces g 1
```

2.24.3 show vlan protocol-vlan

Syntax

show vlan protocol-vlan [group <1-8>]

Parameter

<1-8>	Specify protocol vlan group to binding

Default

N/A

Mode

Privileged EXEC

Usage

Use the show vlan proto-vlan command in EXEC mode to display Proto VLAN group configuration.

Example

The following example how to display Proto VLAN group configuration

```
Switch# show vlan protocol-vlan
```

2.24.4 show vlan protocol-vlan interfaces

Syntax **show vlan protocol-vlan interfaces** IF_PORTS

Parameter

IF_PORTS	Specify interfaces protocol vlan to display

Default N/A

Mode Privileged EXEC

Usage Use the show vlan protocol-vlan interface command in EXEC mode to display the Protocol VLAN interfaces setting

Example The following example shows how to display the Protocol VLAN interfaces setting

```
Switch# show vlan protocol-vlan interfaces g 1
```

2.25 QoS

2.25.1 qos

Syntax **qos / no qos**

Parameter N/A

Default Default qos is disabled.

Mode Privileged EXEC

Usage Use "**qos**" command to enable quality of service which according to basic trust type to assign queue for packets, and packets with higher priority are able to send first.

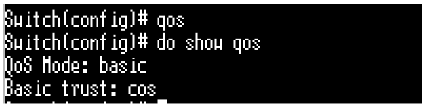
Use no form of this command to disable quality of service.

Example This example shows how to change qos to basic mode.

```
Switch(config)# qos
```

This example shows how to check current qos mode.

```
Switch# show qos
```



```
Switch(config)# qos
Switch(config)# do show qos
QoS Mode: basic
Basic trust: cos
```

2.25.2 qos cos

Syntax **qos cos** <0-7>

Parameter cos <0-7> Specify the CoS value for the interface.

Default Default CoS value for interface is 0.

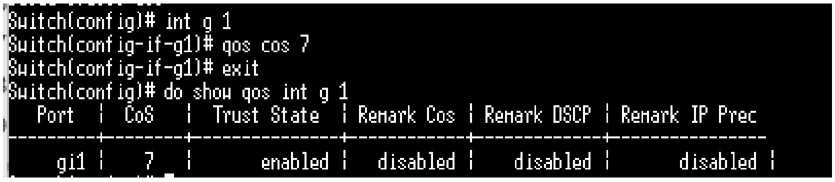
Mode Interface Configuration

Usage Sometimes, there is no qos information in the packets, such as CoS, DSCP, IP Precedence. But we still can give the priority for packets by configuring the interface default cos value. If there is no qos information in the packets, the device will use this default cos value and find the cos-queue map to get the final destination queue.

Use “**qos cos**” command to assign port default cos value.

Example **This example shows how to configure default cos value 7 on interface g 1.**

```
Switch(config)# interface GigabitEthernet 1
Switch(config-if)# qos cos 7
Switch(config-if)# end
Switch# show qos interface GigabitEthernet 1
```



```
Switch(config)# int g 1
Switch(config-if-g1)# qos cos 7
Switch(config-if-g1)# exit
Switch(config)# do show qos int g 1
   Port  ¦  CoS   ¦  Trust State  ¦ Remark Cos ¦ Remark DSCP ¦ Remark IP Prec
---------+--------+---------------+------------+-------------+----------------
     gi1 ¦    7   ¦       enabled ¦   disabled ¦    disabled ¦       disabled ¦
```

2.25.3 qos map

Syntax

qos map (cos-queue | dscp-queue | precedence-queue) SEQUENCE to <1-8>
qos map (queue-cos | queue-precedence) SEQUENCE to <0-7>
qos map queue-dscp SEQUENCE to <0-63>

Parameter

cos-queue	Configure or show CoS to queue map
dscp-queue	Configure or show DSCP to queue map
precedence -queue	Configure or show IP Precedence to queue map.
queue-cos	Configure or show queue to CoS map
queue-dscp	Configure or show queue to DSCP map
queue-precedence	Configure or show queue to IP Precedence map
SEQUENCE	Specify the cos, dscp, precedence or queue with one or multiple values.
<1-8>	Specify th queue id
<0-7>	Specify the cos or precedence values
<0-63>	Specify the dscp values

Default

The default values of cos-queue are showing in the following table.

CoS	Queue ID
0	2
1	1
2	3
3	4
4	5
5	6
6	7
7	8

The default values of dscp-queue are showing in the following table.

DSCP	Queue ID
0~7	1
8~15	2
16~23	3
24~31	4
32~39	5
40~47	6
48~55	7
56~63	8

The default values of ip precedence are showing in the following table.

IP Precedence	Queue ID
0	1
1	2
2	3
3	4
4	5
5	6
6	7
7	8

The default values of queue-cos are showing in the following table.

Queue ID	CoS
1	1
2	0
3	2
4	3
5	4
6	5
7	6
8	7

The default values of queue-dscp are showing in the following table.

Queue ID	DSCP
1	0
2	8
3	16
4	24
5	32
6	40
7	48
8	56

The default values of queue-precedence are showing in the following table.

Queue ID	IP Precedence
1	0
2	1
3	2
4	3
5	4
6	5
7	6
8	7

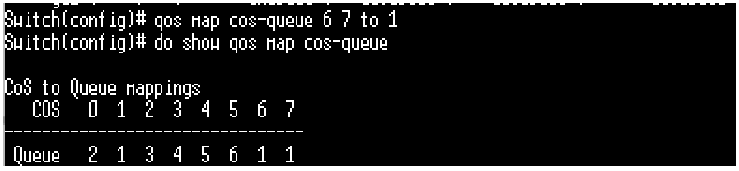
Mode Global Configuration

Usage According to different trust type, packets will be assigned to different queue based on the specific qos map. For example, if the trust type is trust cos, the device will get the cos value in packet and reference the cos-queue mapping to assign the correct queue.

The queue to cos, dscp or precedence maps are used by remarking function. If the port remarking feature is enabled, the remarking function will reference these 3 tables to remark packets.

Example This example shows how to map cos 6 and 7 to queue 1

```
Switch(config)# qos map cos-queue 6 7 to 1
Switch# show qos map cos-queue
```



```
Switch(config)# qos map cos-queue 6 7 to 1
Switch(config)# do show qos map cos-queue

CoS to Queue mappings
   COS   0  1  2  3  4  5  6  7
--------------------------------
 Queue   2  1  3  4  5  6  1  1
```

This example shows how to map queue 4 and 5 to cos 7.

```
Switch(config)# qos map queue-cos 4 5 to 7
 Switch# show qos map queue-cos
```

2.25.4 qos queue

Syntax

qos queue strict-priority-num <0-8>
qos queue weight SEQUENCE
show qos queueing

Parameter

strict-priority-num <0-8>	Specify the strict priority queue number
weight SEQUENCE	Specify the non-strict priority queue weight value. The valid queue weight value is from 1 to 127.

Default

Default strict priority queue number is 8, it means all queues are strict priority queue.

The default queue weight for each queue is shown in following table.

Queue ID	Queue Weight
1	1
2	2
3	3
4	4
5	5
6	9
7	13
8	15

Mode Global Configuration

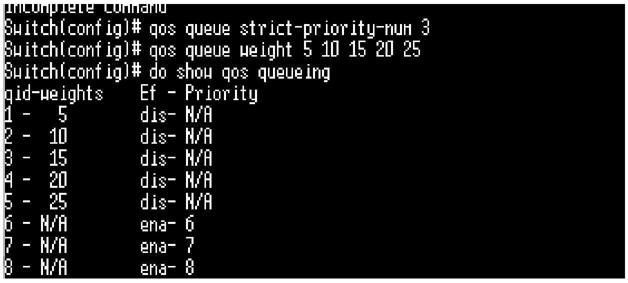
Usage

The device support total 8 queues for QoS queueing. It is able to set the queue to be strict priority queue or weighted queue to prevent starvation. The queue with higher id value has higher priority.
First, you need to decide how many strict priority queue you need. The strict priority queue will always occupy the higher priority queue. For example, if you specify the strict priority number to be 2, then the queue 7 and 8 will be the strict priority queues and the others are weighted queues.

After you setup the number of strict priority queue, you need to setup the weight for the weighted queues by using “qos queue weight” command. And the bandwidth will shared by the weight you configured between these weighted queues.

Example This example shows how to setup device with 3 strict priority queues and give other weighted queues with weight 5, 10, 15, 20, 25.

```
Switch(config)# qos queue strict-priority-num 3
Switch(config)# qos queue weight 5 10 15 20 25
Switch# show qos queueing
```



```
Incomplete Command
Switch(config)# qos queue strict-priority-num 3
Switch(config)# qos queue weight 5 10 15 20 25
Switch(config)# do show qos queueing
qid-weights    Ef - Priority
1 -   5        dis- N/A
2 -  10        dis- N/A
3 -  15        dis- N/A
4 -  20        dis- N/A
5 -  25        dis- N/A
6 - N/A        ena- 6
7 - N/A        ena- 7
8 - N/A        ena- 8
```

2.25.5 qos remark

Syntax

qos remark (cos | dscp | precedence)
no qos remark (cos | dscp | precedence)

Parameter

cos	Enable/Disable cos remarking.
dscp	Enable/Disable dscp remarking.
precedence	Enable/Disable precedence remarking.

Default

Default CoS remarking is disabled.
Default DSCP remarking is disabled.
Default IP Precedence remarking is disabled.

Mode

Interface Configuration

Usage

QoS remarking feature allow you to change priority information in packets based on egress queue. For example, you want all packets egress from interface fa1 queue 1 to remark the cos value to be 5 for next tier of device, you can enable the cos remarking feature on fa1 and configure the queue-cos map for queue 1 map to cos 5.

Use "**qos remark**" command to enable remarking feature on specific type.
And use "**no qow remark**" command to disable it.

Example

This example shows how to enable remarking features on interface fa1.

```
Switch(config)# interface GigabitEthernet 1
Switch(config-if)# qos remark cos
Switch(config-if)# qos remark dscp
Switch(config-if)# qos remark precedence
Switch(config-if)# end
Switch# show qos interface GigabitEthernet 1
```

2.25.6 qos trust

Syntax **qos trust (cos | cos-dscp | dscp | precedence)**

Parameter

cos	Specify the device to trust CoS
cos-dscp	Specify the device to trust DSCP for IP packets, and trust CoS for non-IP packets.
dscp	Specify the device to trust DSCP
precedence	Specify the device to trust IP Precedence

Default Default QoS trust type is cos.

Mode Global Configuration

Usage In QoS basic mode, there are 4 trust types for device to judge the appropriate queue of the packets. This command is able to switch between these trust types.

CoS:

IEEE 802.1p defined 3bits priority value in vlan tag. Trust this value in packets and assign queue according to cos-queue map.

DSCP:

IETF RFC2474 defined 6bits priority value in IP packet (highest 6bits in ToS field). Trust this value in packets and assign queue according to dscp-queue map.

IP Precedence:

The highest 3bits priority value in IP packet ToS field. Trust this value in packets and assign queue according to precedence-queue map.

CoS-DSCP:

Trust DSCP for IP packets and assign queue according to dscp-queue map. Trust CoS for non-IP packets and assign queue according to cos-queue map.

Example This example shows how to change qos basic mode trust types.

```
Switch(config)# qos trust cos
Switch(config)# qos trust cos-dscp
Switch(config)# qos trust dscp
Switch(config)# qos trust precedence
```

This example shows how to check current qos trust type.

```
Switch# show qos
```

2.25.7 qos trust(Interface)

Syntax **qos trust / no qos trust**

Parameter N/A

Default Default interface qos trust state is enabled.

Mode Interface Configuration

Usage After QoS function is enabled in basic mode, the device also support per interface enable/disable the qos function. If the trust state on interface is enabled, all ingress packets of this interface will remap according to the trust type and the qos maps. Otherwise, all ingress packets will assign to queue 1.

Use “**qos trust**” to enable trust state on interface and use “**no qos trust**” to disable trust state on interface.

Example This example shows how to disable qos trust state on interface fa1.

```
Switch(config)# interface GigabitEthernet 1
Switch(config-if)# no qos trust
Switch(config-if)# end
Switch# show qos interface GigabitEthernet 1
```

2.25.8 show qos

Syntax **show qos**

Parameter N/A

Default No default value for this command.

Mode Privileged EXEC

Usage Use “**show qos**” command to show qos state and trust type.

Example This example shows how to check current qos mode.

```
Switch# show qos
```

2.25.9 show qos interface

Syntax	**show qos interface** IF_PORTS
Parameter	IF_PORTS Select port to show qos configurations.
Default	No default value for this command.
Mode	Privileged EXEC
Usage	Use "**show qos interfaces**" command to show port default cos ,remarking state and remarking type state informations.
Example	This example shows how to show qos configurations on interface g 1. `Switch# show qos interface GigabitEthernet 1`

2.25.10 show qos map

Syntax	**show qos map [(cos-queue | dscp-queue | precedence-queue | queue-cos |queue-dscp | queue-precedence)]**
Parameter	**cos-queue** Show CoS to queue map. **dscp-queue** Show DSCP to queue map. **precedence-queue** Show IP Precedence to queue map. **queue-cos** Show queue to CoS map. **queue-dscp** Show queue to DSCP map. **queue-precedence** Show queue to IP Precedence map.
Default	No default value for this command.
Mode	Privileged EXEC
Usage	Use "s**how qos map**" command to show all kinds of mapping for qos remapping and remarking features.
Example	This example shows how to show all qos maps. `Switch(config)# show qos map`

2.25.11 show qos queueing

Syntax **show qos queueing**

Parameter No default value for this command.

Default No default value for this command.

Mode Privileged EXEC

Usage Use “**show qos queueing**” command to show qos queueing information.

Example This example shows how to check current qos queueing information.

```
Switch# show qos queueing
```

2.26 Rate Limit

2.26.1 rate limit egress

Syntax **rate-limit egress** <16-1000000>
no rate-limit egress

Parameter <16-1000000> Specify the committed information rate.

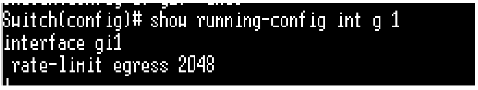
Default Default rate limit is disabled.

Mode Interface configuration

Usage Use the “**rate-limit egress**” command to configure the egress port shaper. Use the **no** form of this command to disable the shaper. You can verify your setting by entering the **show running-config interfaces** command.

Example The following example show how to configure ingress port rate limit and egress port shaper.

```
Switch(config)# interfaces gi1
Switch(config-if)# rate-limit egress 2048
Switch# show running-config interfaces gi1
```



```
Switch(config)# show running-config int g 1
interface gi1
 rate-limit egress 2048
```

2.26.2 rate limit egress queue

Syntax

rate-limit egress queue <1-8> <16-1000000>
no rate-limit egress queue <1-8>

Parameter

<1-8>	Specify the egress shaper queue number
<16-1000000>	Specify the queue rate.

Default

Default queue rate limit is disabled.

Mode

Interface configuration

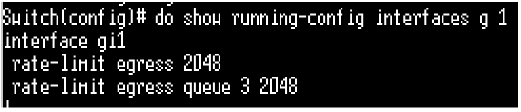
Usage

Use the "**rate-limit egress queue**" command to configure the egress queue shaper. Use the **no** form of this command to disable the queue shaper.You can verify your setting by entering the s**how running-config interfaces** command.

Example

The following example show how to configure ingress port rate limit and egress port shaper.

```
Switch(config)# interfaces gi1
Switch(config-if)# rate-limit egress queue 3 2048
Switch# show running-config interfaces gi1
```



```
Switch(config)# do show running-config interfaces g 1
interface gi1
 rate-limit egress 2048
 rate-limit egress queue 3 2048
```

2.26.3 rate limit ingress

Syntax

rate-limit ingress <16-1000000>
no rate-limit ingress

Parameter

<1-8>	Specify the egress shaper queue number
<16-1000000>	Specify the ingress limit rate

Default

Rate limiting is disabled.

Mode

Interface configuration

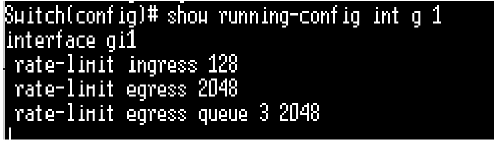
Usage

Use the "**rate-limit ingress**" command to limit the incoming traffic rate on a port. Use the **no** form of this command to disable the rate limit. You can verify your setting by entering the **show running-config interfaces** command

Example

The following example show how to configure ingress port rate limit.

```
Switch(config)# interfaces gi1
Switch(config-if)# rate-limit ingress 128
Switch# show running-config interfaces gi1
```



```
Switch(config)# show running-config int g 1
interface gi1
 rate-limit ingress 128
 rate-limit egress 2048
 rate-limit egress queue 3 2048
```

2.27 RMON

2.27.1 rmon event

Syntax

rmon event <1-65535> [log] [trap COMMUNITY] [description DESCRIPTION] [owner NAME]
no rmon event <1-65535>

Parameter

<1-65535>	Specify event index to create or modify.
[log]	(Optional)Specify to show syslog.
[trap COMMUNITY]	(Optional)Specify SNMP community to show SNMP trap.
[description DESCRIPTION]	(Optional)Specify description of event
[owner NAME]	(Optional)Specify owner of event.

Default

No default is defined.

Mode

Global Configuration

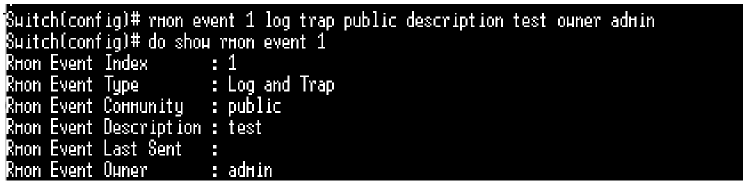
Usage

Use the **rmon event** command to add or modify a RMON evnet entry.
Use the no form of this command to delete.
You can verify settings by the **show rmon event** command.

Example

The example shows how to add RMON event entry with log and trap action and then modify it action to log only.

```
switch(config)# rmon event 1 log trap public
                description test owner admin
switch(config)# show rmon event 1
```



```
Switch(config)# rmon event 1 log trap public description test owner admin
Switch(config)# do show rmon event 1
Rmon Event Index       : 1
Rmon Event Type        : Log and Trap
Rmon Event Community   : public
Rmon Event Description : test
Rmon Event Last Sent   :
Rmon Event Owner       : admin
```

2.27.2 rmon alarm

Syntax

rmon alarm <1-65535> interface IF_PORT (drop-events|octets|pkts|broadcast-pkts| multicast-pkts|crc-align-errors|undersize-pkts|oversizepkts|fragments|jabbers|collisions|pkts64octets|pkts65to127octets|pkts128to255octets|pkts256to511octets|pkts512to1023octets|pkts1024to1518octets) <1-2147483647> (absolute|delta) rising <0-2147483647> <0-65535> falling <0-2147483647> <0-65535> startup (rising|rising-falling|falling) [owner NAME]
no rmon alarm <1-65535>

Parameter

<1-65535>	Specify alarm index to create or modify
IF_PORT	Specify the interface to sample
(variable)	Specify a mib object to sample
<1-2147483647>	Specify the time in seconds that the alarm monitors the MIB variable.
(absolute|delta)	Specify absolute to compare sample counter absolutely. Specify delta to compare delta counter between samples
<0-2147483647>	Specify a number which the alarm trigger rising event
<0-65535>	Specify event index when the rising threshold exceeds.
<0-2147483647>	Specify a number which the alarm trigger falling event
<0-65535>	Specify event index when the falling threshold exceeds.
(rising|rising-falling|falling)	Specify only to how rising or falling startup event. Or show either rising or falling startup event.
[owner NAME]	(Optional) Specify owner of alarm.

Default No default is defined.

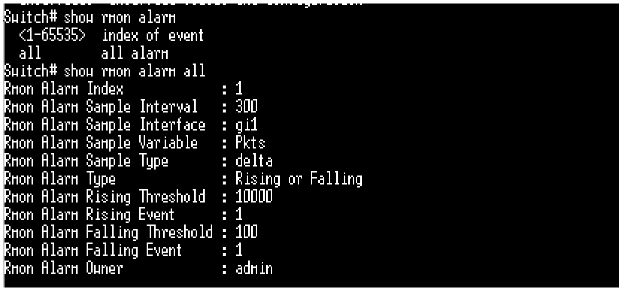
Mode Global Configuration

Usage Use the **rmon alarm** command to add or modify a RMON alarm entry. Before add alarm entry, at least one event entry must be added. Use the **no** form of this command to delete.
You can verify settings by the **show rmon alarm** command.

Example

The example shows how to add RMON alarm entry that sample interface fa1 packets delta count every 300 seconds. Trigger event index 1 if over than rising threshold 10000, trigger event index 2 if lower than falling threshold.

```
switch(config)# rmon event 1 log
switch(config)# rmon event 2 log

Switch(config)# rmon alarm 1 interface gi1 pkts 300
delta rising 10000 1 falling 100 1 startup rising-
falling owner admin
```



```
Switch# show rmon alarm
  <1-65535>  index of event
  all        all alarm
Switch# show rmon alarm all
Rmon Alarm Index            : 1
Rmon Alarm Sample Interval  : 300
Rmon Alarm Sample Interface : gi1
Rmon Alarm Sample Variable  : Pkts
Rmon Alarm Sample Type      : delta
Rmon Alarm Type             : Rising or Falling
Rmon Alarm Rising Threshold : 10000
Rmon Alarm Rising Event     : 1
Rmon Alarm Falling Threshold : 100
Rmon Alarm Falling Event    : 1
Rmon Alarm Owner            : admin
```

2.27.3 rmon history

Syntax

rmon history <1-65535> interface IF_PORT [buckets <1-65535>] [interval <1-3600>] [owner NAME]
no rmon history <1-65535>

Parameter

<1-65535>	Specify history index to create or modify.
IF_PORT	Specify the interface to sample
[bucket <1-65535>]	(Optional) Specify the maximum number of buckets.
[interval <>1-3600]	(Optional) Specify time interval for each sample
[owner NAME]	(Optional)Specify owner of history

Default

No default is defined.

Mode

Global Configuration

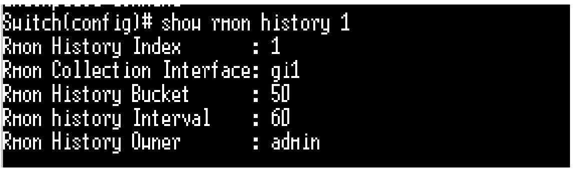
Usage

Use the **rmon history** command to add or modify a RMON history entry. Use the **no** form of this command to delete. You can verify settings by the **show rmon history** command.

Example

The example shows how to add RMON history entry that monitor interface gi1 every 60 seconds and then modify it to monitor every 30 seconds.

```
switch(config)# rmon history 1 interface gi1 interval
                60 owner admin
switch(config)# show rmon history 1
```



```
Switch(config)# show rmon history 1
Rmon History Index       : 1
Rmon Collection Interface: gi1
Rmon History Bucket      : 50
Rmon history Interval    : 60
Rmon History Owner       : admin
```

2.27.4 clear rmon interfaces statistics

Syntax **clear rmon interfaces IF_PORTS statistics**

Parameter

IF_PORTS	specifies ports to clear

Default No default is defined.

Mode Privileged EXEC

Usage Use the **clear rmon interfaces statistics** command to clear RMON etherStat statistics those are recorded on interface.

You can verify results by the **show rmon interface statistics** command.

Example The example shows how to clear RMON etherStat statistics on interface gi1.

```
switch# clear rmon interfaces gi1 statistics
switch# show rmon interfaces gi1 statistics
```

2.27.5 show rmon interfaces statistics

Syntax **show rmon interfaces IF_PORTS statistics**

Parameter

IF_PORTS	specifies ports to show

Default No default is defined.

Mode Privileged EXEC

Usage Use the **show rmon interfaces statistics** command to show RMON etherStatstatistics of interface.

Example The example shows how to show RMON etherStat statistics of interface gi1.

```
switch(config)# show rmon interfaces gi1 statistics
```

2.27.6 show rmon event

Syntax **show rmon event <1-65535> log**

Parameter

<1-65535>	specifies event index to show
all	Show all existed event

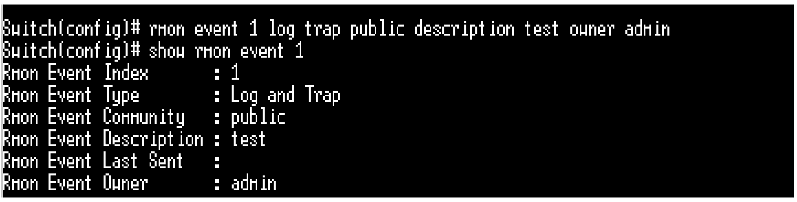
Default No default is defined.

Mode Privileged EXEC

Usage Use the **show rmon event** command to show existed RMON event entry.

Example The example shows how to show rmon event entry.

```
switch(config)# rmon event 1 log trap public
                description test owner admin
switch(config)# show rmon event 1
```



```
Switch(config)# rmon event 1 log trap public description test owner admin
Switch(config)# show rmon event 1
Rmon Event Index       : 1
Rmon Event Type        : Log and Trap
Rmon Event Community   : public
Rmon Event Description : test
Rmon Event Last Sent   :
Rmon Event Owner       : admin
```

2.27.7 show rmon event log

Syntax **show rmon event (<1-65535> | all)**

Parameter

<1-65535>	specifies event index to show event log

Default No entry and log is exist

Mode Privileged EXEC

Usage Use the **show rmon event log** command to show log triggered by RMON alarm.

Example The example shows how to show rmon event log.

```
switch(config)# show rmon event 1 log
```

2.27.8 show rmon alarm

Syntax **show rmon alarm (<1-65535> | all)**

Parameter

<1-65535>	specifies alarm index to show
All	Show all existed alarm

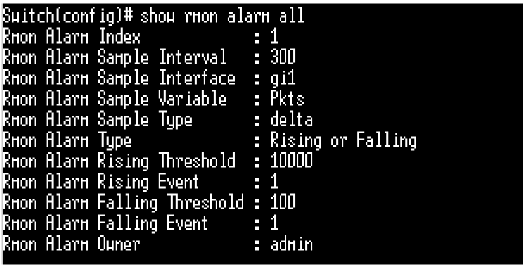
Default No alarm is defined

Mode Privileged EXEC

Usage Use the **show rmon alarm** command to show existed RMON alarm entry.

Example The example shows how to show rmon alarm entry.

```
Switch(config)# rmon alarm 1 interface gi1 pkts 300
                delta rising 10000 1 falling 100 1
                startup  rising-falling owner admin
```



```
Switch(config)# show rmon alarm all
Rmon Alarm Index              : 1
Rmon Alarm Sample Interval    : 300
Rmon Alarm Sample Interface   : gi1
Rmon Alarm Sample Variable    : Pkts
Rmon Alarm Sample Type        : delta
Rmon Alarm Type               : Rising or Falling
Rmon Alarm Rising Threshold   : 10000
Rmon Alarm Rising Event       : 1
Rmon Alarm Falling Threshold  : 100
Rmon Alarm Falling Event      : 1
Rmon Alarm Owner              : admin
```

2.27.9 show rmon history

Syntax **show rmon history (<1-65535> | all)**

Parameter

<1-65535>	specifies history index to show
All	Show all existed history

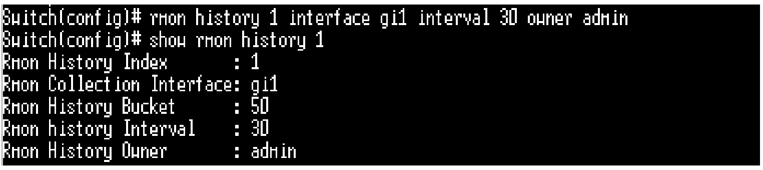
Default No history is defined

Mode Privileged EXEC

Usage Use the **show rmon history** command to show existed RMON history entry.

Example The example shows how to show RMON history entry.

```
switch(config)# rmon history 1 interface gi1 interval
                30 owner admin
switch(config)# show rmon history 1
```



```
Switch(config)# rmon history 1 interface gi1 interval 30 owner admin
Switch(config)# show rmon history 1
Rmon History Index       : 1
Rmon Collection Interface: gi1
Rmon History Bucket      : 50
Rmon history Interval    : 30
Rmon History Owner       : admin
```

2.27.10 show rmon history statistic

Syntax **show rmon history <1-65535> statistic**

Parameter

<1-65535>	specifies history index to show history statistic

Default No history is defined

Mode Privileged EXEC

Usage Use the show **rmon history statistic** command to show statistics that are recorded by RMON history.

Example The example shows how to show RMON history statistics

```
switch(config)# show rmon history 1 statistics
```

2.28 SNMP

2.28.1 show snmp

Syntax	**show snmp**
Parameter	N/A
Default	N/A
Mode	Privileged EXEC
Usage	To show the status of Simple Network Management Protocol (SNMP), use the command **show snmp** in the Privileged EXEC mode.
Example	The following example shows the SNMP status. `Switch# show snmp`

2.28.2 show snmp community

Syntax	**show snmp community**
Parameter	N/A
Default	N/A
Mode	Privileged EXEC
Usage	To show the configuration of snmp communities, use the command **show snmp community** in the Privileged EXEC mode.
Example	The following example shows the SNMP communities configuration. `Switch# show snmp community`

2.28.3 show snmp engineid

Syntax	**show snmp engineid**
Parameter	N/A
Default	N/A
Mode	Privileged EXEC
Usage	To show the SNMPv3 engine IDs defined on the switch, use the command **show snmp engineid** in the Privileged EXEC mode.
Example	The following example shows the SNMP engind id information. `Switch# show snmp engineid`

2.28.4 show snmp group

Syntax	**show snmp group**
Parameter	N/A
Default	N/A
Mode	Privileged EXEC
Usage	To show the SNMP group configuration on the switch, use the command show snmp group in the Privileged EXEC mode.
Example	The following example shows the SNMP group configuration. `Switch# show snmp group`

2.28.5 show snmp host

Syntax

show snmp host

Parameter

N/A

Default

N/A

Mode

Privileged EXEC

Usage

To show the SNMP trap notification recipients defined on the switch, use the command **show snmp host** in the Privileged EXEC mode.

Example

The following example shows the configuration of SNMP notification recipients on the switch.

```
Switch# show snmp host
```

2.28.6 show snmp trap

Syntax

show snmp trap

Parameter

N/A

Default

N/A

Mode

Privileged EXEC

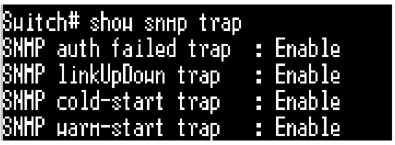
Usage

To show the status of SNMP traps on the switch, use the command **show snmp trap** in the Privileged EXEC mode.

Example

The following example shows the status of SNMP traps.

```
Switch# show snmp trap
```



```
Switch# show snmp trap
SNMP auth failed trap  : Enable
SNMP linkUpDown trap   : Enable
SNMP cold-start trap   : Enable
SNMP warm-start trap   : Enable
```

2.28.7 show snmp view

Syntax	**show snmp view**
Parameter	N/A
Default	N/A
Mode	Privileged EXEC
Usage	To show the SNMP view defined on the switch, use the command **show snmp view** in the Privileged EXEC mode.
Example	The following example shows the configuration of SNMP view. `Switch# show snmp view`

2.28.8 show snmp user

Syntax	**show snmp user**
Parameter	N/A
Default	N/A
Mode	Privileged EXEC
Usage	To show the SNMP users defined on the switch, use the command **show snmp user** in the Privileged EXEC mode.
Example	The following example shows the configuration of SNMP user. `Switch# show snmp user`

2.28.9 snmp

Syntax	**snmp**
Parameter	N/A
Default	SNMP is disabled by default
Mode	Global Configuration
Usage	To enable the SNMP on the switch, use the command snmp in the Global Configuration mode. Otherwise, use the no form of the command to disable to SNMP.
Example	The following example enables the SNMP. `Switch(config)# snmp`

2.28.10 snmp community

Syntax

snmp community community-name [view view-name] (ro|rw)
snmp community community-name group group-name
no snmp community community-name

Parameter

community-name	The SNMP community name. Its maximum length is 20 characters.
view view-name	Specify the SNMP view configured by the command **snmp view** to define the object available to the community.
ro	Read only access (default)
rw	Writable access
group group-name	Specify the SNMP group configured by the command snmp group to define the object available to the community.

Default No SNMP community is configured

Mode Global Configuration

Usage To define the SNMP community that permit access for SNMP v1 and v2, use the command **snmp community** in the Global Configuration mode.

Example The following example defines the SNMP community named private with the default view all, and the access right is read-only.

```
Switch(config)# snmp community private ro
```

2.28.11 snmp engineid

Syntax

snmp engineid (default|ENGINEID)

Parameter

default	Default engine ID generated on the basis of the switch MAC address.
ENGINEID	Specify SNMP engine ID. The engine ID is the 10 to 64 hexadecimal characters, and the hexadecimal number must be divided by 2.

Default

The default SNMP engine ID on the switch is based on switch MAC address.

Mode

Global Configuration

Usage

To define the SNMP engine on the switch, use the command **snmp engineid** in the Global Configuration mode.

Example

The following example configure the switch SNMP engine ID

```
Switch(config)# snmp engineid 00036D001122
```

2.28.12 snmp engineid remote

Syntax

snmp engineid remote (ip-addr|ipv6-addr) ENGINEID

no snmp engineid remote (ip-addr|ipv6-addr)

Parameter

ENGINEID	Specify SNMP engine ID. The engine ID is a 10 to 64 hexadecimal characters, and the hexadecimal number must be divided by 2.
ip-addr	IP address of the remote host
ipv6-addr	IPv6 address of the remote host

Default

N/A

Mode

Global Configuration

Usage

To define the remote host for SNMP engine, use the command snmp engineid remote in the Global Configuration mode; and use the no form of the command to delete the remote host from the SNMP engine.

Example

The following example adds the remote 192.168.1.11 into SNMP engine

```
Switch(config)# snmp engineid remote 192.168.1.11
                00036D10000A
```

2.28.13 snmp group

Syntax

snmp group group-name **(1|2c|3) (noauth|auth|priv)** read-view **read-view** write-view **write-view [notify-view** notify-view**]**
no snmp group group-name security-mode version **(1|2c|3)**

Parameter

group-name	Specify SNMP group name, and the maximum length is 30 characters.
(1|2c|3)	Specify the SNMP version.
noauth	Specify that no packet authentication is performed.
auth	Specify that no packet authentication without entryption is performed. It is applicable only to the SNMPv3 security mode.
priv	Specify that no packet authentication with entryption is performed. It is applicable only to the SNMPv3 security mode.
read-view read- view	Set the view name that enables configuring the agent, and its maximum length is 30 characters.
write-view write- view	Set the view name that enables viewing only, and its maximum length is 30 characters.
notify-view notify- view	Sets the view name that sends only traps with contents that is included in SNMP view selected for notification. The maximum length is 30 characters

Default

No group entry is existed.

Mode

Global Configuration

Usage

To define the SNMP group, use the command **snmp group** in the Glocal Configuration mode, and use the no form of the command to delete the configuration.

SNMP group configuration is used in the command **snmp use** to map SNMP users to the SNMP group. These users would be automatically maped to the SNMP views defined in this command.

The securety level for SNMP v1 or v2 is always **noauth**.

Example

The following example adds SNMPv3 group

```
Switch(config)# snmp group v3 version 3 auth read-view
                all write-view all notify-view all
```

2.28.14 snmp host

Syntax

snmp host (ip-addr|ipv6-addr|hostmane) **[traps|informs] [version (1|2c)]** community-name **[udp-port udp-port] [timeout timeout] [retries** retries**]**
snmp host (ip-addr|ipv6-addr|hostmane**) [traps|informs] version 3[(auth|noauth|priv)] community-name [udp-port udp-port] [timeout timeout] [retries retries]**
no snmp host (ip-addr|ipv6-addr|hostmane**) [traps|informs] [version (1|2c|3)]**

Parameter

ip-addr	The IP adderss of recipet.
ipv6-addr	The IPv6 adderss of recipet.
hostname	The host name of recipet.
traps	Send SNMP traps to the host. It is the default action.
informs	Send SNMP informs to the host.
version (1|2c|3)	Specify the SNMP version.
noauth	Specify that no packet authentication is performed. It is applicable only to the SNMPv3 security mode.
auth	Specify that no packet authentication without entryption is performed. It is applicable only to the SNMPv3 security mode.
priv	Specify that no packet authentication with entryption is performed. It is applicable only to the SNMPv3 security mode.
community-name	The SNMP community sent with the notification.
udp-port udp-port	Specify the UDP port number.
timeout timeout	Specify the SNMP informs timeout
retries retries	Specify the retry counter of the SNMP informs.

Default

No SNMP host is configured.
The default SNMP version for the command is SNMPv1.

Mode

Global Configuration

Usage

To configure the hosts to receive SNMP notificatons, use the command snmp host in the Global Configuration mode; and use the no form of the command to delete the configuration.

Example

The following example adds the recipet 192.168.1.11 for the SNMP traps notification.

```
Switch(config)# snmp host 192.168.1.11 private
```

2.28.15 snmp trap

Syntax	**snmp trap (auth|cold-start|linkUpDown|port-security|warm-start)** **no snmp trap (auth|cold-start|linkUpDown|port-security|warm-start)**

Parameter

auth	Enable the SNMP authentication failure trap.
cold-start	Enable the SNMP cold start-up failure trap.
linkUpDown	Enable the SNMP link up and down failure trap.
port-security	Enable the SNMP port security trap.
warm-start	Enable the SNMP warm start-up failure trap.

Default	All the SNMP traps are enabled.
Mode	Global Configuration
Usage	To send the SNMP traps, use the command snmp trap in the Global Configuration mode; and use the no form of the command to disable the SNMP traps.
Example	The following example disables and enables the SNMP link up and down traps individually.

```
Switch(config)# no snmp trap linkUpDown
Switch(config)# snmp trap linkUpDown
```

2.28.16 snmp user

Syntax	**snmp user username group-name [auth (md5|sha) AUTHPASSWD]** **snmp user username group-name auth (md5|sha) AUTHPASSWD priv PRIVPASSWD** **no snmp user username**

username	Specify the SNMP user name on the host that connects to the SNMP agent. The max character is 30 characters. For the SNMP v1 or v2c, the user name must match the community name by the command snmp host.
group-name	Specify the SNMP group to which the SNMP user belongs. The SNMP group should be SNMPv3 and configured by the command snmp group.
auth (md5|)	Specify the HMAC-MD5-96 authentication protocol as the user authentication.
auth (sha|)	Specify the HMAC-SHA-96 authentication protocol as the user authentication.
AUTHPASSWD	The password for authentication and the range of length is from 8 to 32 characters.

Parameter	**Priv** PRIVPASSWD	The private password for the privacy key, and the range of length is from 8 to 64 characters.
Default	N/A	
Mode	Global Configuration	
Usage	To define a SNMP user, use the command snmp user in the Global Configuration mode; and use the no form to delete the SNMP user.	
Example	The following example adds SNMP user v3 into the group v3 by the MD5 authentication.	

```
Switch(config)# snmp user v3 v3 auth md5 12345678
```

2.28.17 snmp view

Syntax

snmp view view-name subtree oid-tree oid-mask (all|oid-mask) viewtype(included|excluded)
no snmp view view-name subtree (all|oid-tree)

Parameter

view-name	The SNMP view name. Its maximum length is 30 characters.
subtree oid-tree	Specify the ASN.1 subtree object identifier (OID) to be included or excluded from the SNMP view.
oid-mask (all|oid- mask**)**	Specify the OID family mask. It is used to define a family of view subtrees. For example, OID mask FA.80 is is 11111010.10000000. The length of the OID mask must be less than the length of subtree OID.
iewtype (included|excluded)	Include or exclude the selected MIBs in the view.

Default N/A

Mode Global Configuration

Usage To configure the SNMP view, use the command snmp view in the Global Configuration mode; and use the no form of the command to delete the SNMP view.

The default SNMP view cannot be deleted and modified by users. By default, the maximum numbers of SNMP view is limited to 16.

Example The following example defines the SNMP view.

```
Switch(config)# snmp view private subtree 1.3.3.1 oid-
                    mask all viewtype included
```

2.29 Spanning Tree

2.29.1 instance (MST)

Syntax

instance instance-id vlan vlan-list
no instance instance-id vlan vlan-list

Parameter

instance-id	The MSTP instance ID from 0 to 15.
vlan vlan-list	Add the VLAN list to the MSTP instance.

Default All VLANs are mapped to the Common and Internal Spanning Tree (CIST) instance (instance 0).

Mode MST Configuration

Usage To map the VLAN to the Multiple Spanning Tree (MSTP) instances, use the command instance in the MST Configuration mode; and use the no form of the command to restore its default configuration.

All VLANs that are not explicility configured to an MSTP instance are mapped to the CIST instance (instance 0).

For two or more switches in the samp MSTP regiom, their VLAN mapping, name and revision number configuration, must be the same.

Example The following example maps the vlan 10-20 to the MSTP instance 1, and VLAN 100 to instance 2.

```
Switch(config)# spanning-tree mst configuration
Switch(config-mst)# instance 1 vlan 10-20
Switch(config-mst)# instance 2 vlan 100
```

2.29.2 name(MST)

Syntax

name name-str
no name

Parameter

name-str	The MSTP instance name. Its maximum length is 32 characters.

Default

The default MSTP name is the switch MAC address.

Mode

MST Configuration

Usage

To define the name for MSTP instance, use the command name in the MST Configuration mode; and use the no form to restore the default name configuration.

Example

The following example configures the name of MST instance to fiberroad

```
Switch(config)# spanning-tree mst configuration
Switch(config-mst)# name fiberroad
```

2.29.3 revision(MST)

Syntax

revision rev
no revision

Parameter

rev	The MSTP revision number. Its valid rage is from 0 to 65535.

Default

The default revision number is 0.

Mode

MST Configuration

Usage

To define the revision for the MSTP configuration, use the command revision in the MST Configuration mode; and use the no form of the command to restore it default configuration.

Example

The following example defines the revision MSTP configuration to 1.

```
Switch(config)# spanning-tree mst configuration
Switch(config-mst)# revision 1
```

2.29.4 show spanning-tree

Syntax **show spanning-tree**

Parameter N/A

Default N/A

Mode Privileged EXEC

Usage To display the spanning tree configuration, use the command spanning-tree in the Privileged EXEC mode

Example The following example shows the spanning tree configuration.

```
Switch# show spanning-tree
```

2.29.5 show spanning-tree interface

Syntax **show spanning-tree interface** IF_PORTS **[statistic]**

Parameter

interface IF_PORTS	An interface ID or the list of interface IDs.
statistic	Display the STP statistic for an interface.

Default N/A

Mode Privileged EXEC

Usage To show the STP configuration and statistics for an interface, use the command **show spanning-tree interface** in the Privileged EXEC mode.

Example The following example shows the STP configuration for the interface g23.

```
Switch# show spanning-tree interfaces g 23
```

The following example shows the STP statistic for the interface fa23.

```
Switch# show spanning-tree interfaces g 23 statistic
```

2.29.6 show spanning-tree mst

Syntax **show spanning-tree mst** instace-id

Parameter

instance-id	The MSTP instance ID. Its valid range is from 0 to 15.

Default N/A

Mode Privileged EXEC

Usage To show the information for a specific MSTP instance, use the command show **spanning-tree mst** in the Privileged EXEC mode.

Example The following example displays the information for the MSTP instance 0 and 1 individually.

```
Switch# show spanning-tree mst 0
Switch# show spanning-tree
```

2.29.7 show spanning-tree mst configuration

Syntax **show spanning-tree mst configuration**

Parameter N/A

Default N/A

Mode Privileged EXEC

Usage To show the global MST configuration, use the command **show spanning-tree mst configuration** in the Privileged EXEC mode.

Example The following example shows the global MST configuration.

```
Switch# show spanning-tree mst configuration
```

2.29.8 show spanning-tree mst interface

Syntax	**show spanning-tree mst** instance-id **interface** IF_PORTS
Parameter	instance-id: The MSTP instance ID. Its valid range is from 0 to 15. **Interface IF_PORTS**: An interface ID or the list of interface IDs.
Default	N/A
Mode	Privileged EXEC
Usage	To show the MSTP instance information on the specific interface, use the command **show spanning-tree mst interface** in the Privileged EXEC mode.
Example	The following example shows the MSTP 0 and 1 information individually on the interface g 23. `Switch# show spanning-tree mst 0 interfaces g 23`

2.29.9 spanning-tree

Syntax	**spanning-tree** **no spanning-tree**
Parameter	N/A
Default	Spanning-Tree is enabled by default.
Mode	Global Configuration
Usage	To enable the spanning tree, use the command spanning-tree in the Global Configuration mode; and use the no form of the command to disable the spanning tree on the switch.
Example	The following example disables and enables the spanning tree individually. `Switch(config)# no spanning-tree`

2.29.10 spanning-tree bpdu

Syntax

spanning-tree bpdu (filtering|flooding)
no spanning-tree bpdu

Parameter

filtering	Filter the BPDU when STP is diabled.
flooding	Flood the BPDU when the STP is disabled.

Default

The default configuration is flooding.

Mode

Global Configuration

Usage

To configure the action of Bridge Protocol Data Unit (BPDU) handlring when STP is disabled, use the command spanning-tree bpdu in the Global Configuration mode. To restore the configuration to the default action, use the no form of the command.

Example

The following example configures the action of BPDU handling to fliter when the STP is disabled.

```
Switch(config)# spanning-tree bpdu filtering
```

2.29.11 spanning-tree bpdu-filter

Syntax

spanning-tree bpdu-filter
no spanning-tree bpdu-filter

Parameter

N/A

Default

BPDU filter is disabled.

Mode

Interface Configuration

Usage

To enable the BPDU filter, use the command spanning-tree bpdu-filter in the Interface Configuration mode; and use no form of the command to disable the BPDU filter.

Example

The following example enables the BPDU filter for interface fa1.

```
Switch(config)# interface fa1
Switch(config-if)# spanning-tree bpdu-filter
```

2.29.12 spanning-tree bpdu-guard

Syntax

spanning-tree bpdu-guard
no spanning-tree bpdu-guard

Parameter N/A

Default BPDU guard is disabled

Mode Interface Configuration

Usage To enable the BPDU filter, use the command spanning-tree bpdu-guard in the Interface Configuration mode; and use no form of the command to disable the BPDU filter.

Example The following example enables the BPDU guard for interface gi1.

```
Switch(config)# interface gi1
Switch(config-if)# spanning-tree bpdu-guard
```

2.29.13 spanning-tree cost

Syntax

spanning-tree cost cost
no spanning-tree cost

Parameter

cost	The port path cost. For the long path cost method, its valid range is from 0 to 200000000; and the valid range is from 0 to 65535 for the short path cost method. The value 0 indicates AUTO, which the port path cost is determined by the port speed and the path cost method.

Default The default port path cost is 0, and it is determined by the port speed and the path cost method (long or short).

Interface	Long	Short
Gigabit Ethernet (1000Mbps)	20000	4
Fast Ethernet (100Mbps)	200000	19
Ethernet (10Mbps)	2000000	100

Mode Interface Configuration

Usage To configure the STP path cost for an interface, use the command spanning-tree cost in the Interface Configuration mode; and use the no form of the command to restore it to the default configuration.

Example

The following example configures port path cost to 30000 for interface g 2.

```
Switch(config)# interface gi1
Switch(config-if)# spanning-tree cost 30000
```

2.29.14 spanning-tree forward-time

Syntax

spanning-tree forward-time seconds
no spanning-tree forward-time

Parameter

seconds	STP forward delay time. Its valid range is from 4 to 10 seconds.

Default

The default forward delay time is 15 seconds.

Mode

Global Configuration

Usage

To configure the STP bridge forward delay time, which is the amount of time that a port remains in the Listening and Learning states before it enters the Forwarding state, use the command spanning-tree forward-time in the Global Configuration mode. To restore it to the default configuration, use the **no** form of the command.

When the forward delay time is configured, the following relationship shold be maintained:

2 * (forward-time - 1) >= Max-Age

Example

The following example configures STP forward delay time to 25.

```
Switch(config)# spanning-tree forward-time 25
```

2.29.15 spanning-tree hello-time

Syntax	**spanning-tree hello-time** seconds **no spanning-tree hello-time**
Parameter	<table><tr><td>seconds</td><td>STP hello time in second. Its valid range is from 1 to 10 seconds.</td></tr></table>
Default	The default STP hello time is 2 seconds.
Mode	Global Configuration
Usage	STP hello time is the time interval to broadcast its hello message to other bridges. To configure the STP hello time, use the command spanning-tree hello-time in the Global Configuration mode; and use the no form of the command to restore the hello time to default configuration. When the hello time is configured, the following relationship should be maintained: Max-Age >= 2 * (hello-time + 1)
Example	The following example configures BPDU hello time to 4. `Switch(config)# spanning-tree hello-time 4`

2.29.16 spanning-tree edge

Syntax	**spanning-tree edge** **no spanning-tree edge**
Parameter	N/A
Default	The default configuration is disabled.
Mode	Interface Configuration
Usage	To enable the edge mode for an interface, use the command spanning-tree edge in the Interface Configuration mode; and use the no form of the command to restore it to the default configuration. In the edge mode, the interface would be put into the Forwarding state immediately upon link up. If the edge mode is enabled for the interface and there are BPDUs received on the interface, the loop might be occurred in the short time.

Example	The following example enables the edge mode for the interface g 1.
	`Switch(config)# interface g 1`
	`Switch(config-if)# spanning-tree edge`

2.29.17 spanning-tree link-type

Syntax

spanning-tree link-type (point-to-point|shared)
no spanning-tree link-type

Parameter

point-to-point	Specify the port link type is point to point.
shared	Specify the port link type is shared.

Default

The default configuration link type is **point-to-point** for the ports with full duplex configuration, and **shared** for the ports with half duplex settings.

Mode

Interface Configuration

Usage

To set the RSTP link-type for an interface, use the command spanning-tree link in the Interface Configuration mode. For the default configuration, use the no form of the command.

Example

The following example configures the link-type to point-to-point for the interface g 1.

```
Switch(config)# interface g 1
Switch(config-if)# spanning-tree link-type point-to-
                   point
```

2.29.18 spanning-tree maximum-age

Syntax

spanning-tree maximum-age seconds
no spanning-tree maximum-age

Parameter

seconds	The interval in seconds for a switch to wait the configuration messages, without attempting to redefine its own configuration.

Default

The default maximum age is 20 seconds.

Mode

Global Configuration

Usage

To set the interval in seconds that the switch can wait without receiving the configuration messages, before attempting to redefine its own configuration, use the command spanning-tree maximum-age in the Global Configuratio mode. For the default configuration, use the no form of the commands.

When the maximum age is configured, the following relationship should be maintained:

2 * (forward-time - 1)>= Max-Age >= 2 * (hello-time + 1)

Example

The following example configures STP maximum age to 10.

```
Switch(config)# spanning-tree maximum-age 10
```

2.29.19 spanning-tree mcheck

Syntax

spanning-tree mecheck

Parameter

N/A

Default

N/A

Mode

Interface Configuration

Usage

To restart the Spanning Tree Protocol (STP) migration process (re-negotiate forcely with its neighborhood) on the specific interface, use the command spanning-tree mcheck in the Interface Configuration mode

Example

The following example restarts the STP negotiation on the interface g 1.

```
Switch(config)# interface g 1
Switch(config-if)# spanning-tree mecheck
```

2.29.20 spanning-tree mode

Syntax

spanning-tree mode (mstp|rstp|stp)
no spanning-tree force-version

Parameter

mstp	Enable the Multiple Spanning Tree (MSTP) operation.
rstp	Enable the Rapid Spanning Tree (RSTP) operation.
stp	Enable the Spanning Tree (STP) operation.

Default

The default mode is rstp.

Mode

Global Configuration

Usage

To specify the spanning tree operation mode, use the command of spanning- tree mode in the Global Configuration mode. For the default configuration, use the command no spanning-tree force-version in the Global Configuration mode.

When the switch is configured as MSTP mode, it can use STP and RSTP for the backward compatibility with switches working in STP and RSTP mode individually. For the RSTP configuration, the switch can also use STP for the switches working in the STP operation.

Example

The following example sets the STP operation to MSTP.

```
Switch(config)# spanning-tree mode mstp
```

2.29.21 spanning-tree mst configuration

Syntax **spanning-tree mst configuration**

Parameter N/A

Default N/A

Mode Global Configuration

Usage To enter the MST configuration mode for the MSTP configuration modification, use the command spanning-tree mst configuration in the Global Configuration mode.

Example The following example modifies the MSTP configuration in the MST Configuration mode.

```
Switch(config)# spanning-tree mst configuration
Switch(config-mst)# instance 1 vlan 10-20
Switch(config-mst)# name fiberroad
Switch(config-mst)# revision 1
```

2.29.22 spanning-tree mst cost

Syntax **spanning-tree mst** instance-id **cost** cost
no spanning-tree mst instance-id **cost** cost

Parameter

instance-id	Specify the instance ID. The valid range is from 0 to 15.
cost	Specify the path cost for the interfaces on the specific MSTP instance. For the long path cost method, its valid range is from 0 to 200000000; and the valid range is from 0 to 65535 for the short path cost method. The value 0 indicates AUTO, which the port path cost is determined by the port speed and the path cost method.

Default The default port path cost is 0, and it is determined by the port speed and the path cost method (long or short).

Interface	**Long**	**Short**
Gigabit Ethernet (1000Mbps)	20000	4
Fast Ethernet (100Mbps)	200000	19
Ethernet (10Mbps)	2000000	100

Mode Interface Configuration

Usage To configure the path cost for MSTP calculations, use the command spanning-tree mst cost in the Interface Configuration mode. If the loop occurs, the MSTP considers the path cost when selecting the interface into the Forwarding state. For the default configuration, use the no form of the command.
When configuring the path cost on the CIST (instance 0), it is equal to the command spanning-tree cost in the Interface Configuration mode.

Example The following example configures the path cost of interface fa1 on the instance 1 to 30000

```
Switch(config)# interface gi1
Switch(config-if)# spanning-tree mst 1 cost 30000
```

2.29.23 spanning-tree mst port-priority

Syntax **spanning-tree mst** instance-id **port-priority** priority
no spanning-tree mst instance-id **port-priority**

Parameter

instance-id	Specify the instance ID. The valid range is from 0 to 15.
priority	Specify the interface priority on the specific instance.

Default The default port priority on each instance is 128

Mode Interface Configuration

Usage To configure the interface priority on the specific instances, use the command spanning-tree mst port-priority in the Interface Configuration mode. For the default configuration, use the no form of the command.

The priority value must be the multiple of 16. When the port priority on the CIST (instance 0) is configured, it is equal to the command spanning-tree port-priority in the Interface Configuration mode.

Example The following example sets the port priority of gi1 on the instance 1 to 144; and set the port priority of gi1 on the CIST (instance 0) to 96

```
Switch(config)# interface gi1
Switch(config-if)# spanning-tree mst 1 port-priority
                   144
Switch(config-if)# spanning-tree mst 0 port-priority
                   96
```

2.29.24 spanning-tree mst priority

Syntax

spanning-tree mst instance instance-id **priority** priority
no spanning-tree mst instance instance-id **priority**

Parameter

instance-id	Specify the instance ID. The valid range is from 0 to 15.
priority	Specify the bridge priority on the specific instance. The valid range is from 0 to 61440. It nsures the probility that the switch is selected as the root bridge, and the lower values has the higher priority for the switch to be selected as the root bridge.

Default

The default priority on each instance is 32768.

Mode

Global Configuration

Usage

To configure the bridge priority on the specific instance, use the command spanning-tree mst priority in the Global Configuration mode. To restore the default configuration, use the no form of the command.

The value of bridge priority must be the multiple of 4096. A switch with the lowest priority is the root of the STP topology. For the configuration of bridge priority on the CIST (instance 0), it is equal to the command spanning-tree priority in the Global Configuration mode.

Example

The following example modifies the bridge priority to 4096 on instance 0 and instance 1 individually.

```
Switch(config)# spanning-tree mst 0 priority 4096
Switch(config)# spanning-tree mst 1 priority 4096
```

2.29.25 spanning-tree pathcost method

Syntax **spanning-tree pathcost method (long|short)**

Parameter

long	The range for the path cost is from 1 to 200000000.
short	The range for the path cost is from 1 to 65535.

Default The default path cost method is long.

Mode Global Configuration

Usage To set the spanning tree path cost method, use the command **spanning-tree pathcost method** in the Global Configuration mode.

If the short method is specified, the switch calculates the path cost in the range 1 throuth 65535; Otherwise, it calculates the path cost in the range 1 to 200000000.

Example The following example modifies path cost method to short.

```
Switch(config)# spanning-tree pathcost method short
```

2.29.26 spanning-tree port-priority

Syntax **spanning-tree port-priority priority**
no spanning-tree port-priority priority

Parameter

priority	Specify the priority for an interface. The valid range is from 0 to 240.

Default The default priority for each interface is 128.

Mode Interface Configuration

Usage To configure the STP priority for an interface, use the command spanning- tree port-priority in the Interface Configuration mode. For the default configuration, use the no form of the command.

The priority value must be the multiple of 16.

Example The following example modifies the port priority to 96 for the interface gi2 .

```
Switch(config)# interface gi2
Switch(config-if)# spanning-tree port-priority 96
```

2.29.27 spanning-tree priority

Syntax

spanning-tree priority priority
no spanning-tree priority

Parameter

instance-id	Specify the instance ID. The valid range is from 0 to 15.
priority	Specify the bridge STP priority. The valid range is from 0 to 61440. It nsures the probility that the switch is selected as the root bridge, and the lower values has the higher priority for the switch to be selected as the root bridge of SFP topology

Default

The default priority for the switch 32768.

Mode

Global Configuration

Usage

To configure the bridge priority, use the command **spanning-tree mst priority** in the Global Configuration mode. To restore the default configuration, use the no form of the command.

The value of bridge priority must be the multiple of 4096. A switch with the lowest priority is the root of the STP topology. When swithes with the same priority configuration in the environment, the switch with lowest MAC address would be selected as the root bridge.

Example

The following example modifies the bridge priority to 4096.

```
Switch(config)# spanning-tree priority 4096
```

2.29.28 spanning-tree tx-hold-count

Syntax

spanning-tree tx-hold-count count
no spanning-tree tx-hold-count

Parameter

count	Specify the tx-hold-count used to limit the maximum numbers of packets transmission per second. The valid range is from 1 to 10.

Default

The default value is 6.

Mode

Global Configuration

Usage

To limit the maximum numbers of packets transmission per second, use the command spanning-tree tx-hold-count in the Global Configuration mode. For the default configuration, use the no form of the command.

Example

The following example sets the tx-hold-count to 4.

```
Switch(config)# spanning-tree tx-hold-count 4
```

2.30 Storm Control

2.30.1 show storm-control

Syntax

show storm-control
show storm-control interface IF_PORTS

Parameter

IF_PORTS	Specify port to show.

Default

No default value for this command

Mode

Privileged EXEC

Usage

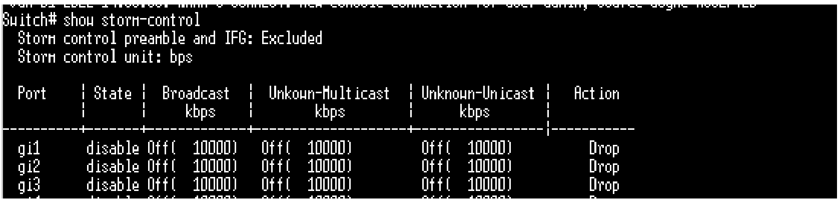
Use "**show storm-control**" command to show all storm control related configurations including global configuration and per port configurations.

Use "**show storm-control interface**" command to show selected port storm control configurations.

Example

This example shows how to show storm control global configuration.

```
Switch# show storm-control
```



```
Switch# show storm-control
  Storm control preamble and IFG: Excluded
  Storm control unit: bps

  Port     | State | Broadcast  | Unkown-Multicast  | Unknown-Unicast |  Action
           |       |   kbps     |       kbps        |      kbps       |
----------+-------+-----------+-------------------+-----------------|-----------
  gi1      disable Off(  10000)  Off(  10000)        Off(  10000)        Drop
  gi2      disable Off(  10000)  Off(  10000)        Off(  10000)        Drop
  gi3      disable Off(  10000)  Off(  10000)        Off(  10000)        Drop
```

2.30.2 storm-control

Syntax

storm-control
no storm-control

storm-control (broadcast | unknown-unicast | unknown-multicast)
no storm-control (broadcast | unknown-unicast | unknown-multicast)

Parameter

broadcast	Select broadcast storm control type
unknown-unicast	Select unknown unicast storm control type
unknown-multicast	Select unknown multicast storm control type

Default

Default storm control is disabled.
Default broadcast storm control is disabled.
Default unknown multicast storm control is disabled
Default unknown unicast storm control is disabled

Mode

Interface Configuration

Usage

Storm control function is able to enable/disable on each single port. Use the "**storm control**" command to enable storm control feature on the selected ports. And use "**no storm control**" command to disable storm control feature. Not only port is able to enable/disable on the port. Each storm control type is also able to enable/disable on each single port.

Use the "**storm-control (broadcast|unknown-unicast|unknown-multicast)**" command to enable the storm control type you need and use no form to disable it.

Example

This example shows how to enable storm control on interface gi1.

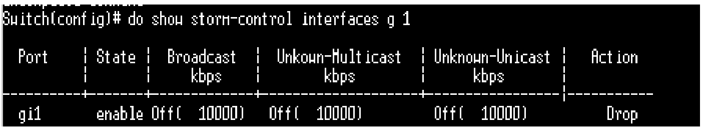
```
Switch(config)# interface gi1
Switch(config-if)# storm-control
```

This example shows how to enable broadcast storm control and configure broadcast storm control rate to 200.

```
Switch(config)# interface gi1
Switch(config-if)# storm-control broadcast
```

This example shows how to show current storm control configuration on interface gi1

```
Switch# show storm-control interfaces gi1
```



```
Switch(config)# do show storm-control interfaces g 1

 Port     | State |  Broadcast  |  Unkown-Multicast  | Unknown-Unicast |   Action
          |       |    kbps     |       kbps         |      kbps       |
----------+-------+-------------+--------------------+-----------------|-----------
 gi1        enable Off(  10000)  Off(  10000)         Off(  10000)         Drop
```

3.30.3 storm-control action

Syntax

storm-control action (drop | shutdown)
no storm-control action

Parameter

drop	Storm control rate calculates by octet-based
shutdown	

Default

Default storm control action is drop.

Mode

Interface Configuration

Usage

Use "**storm-control action**" command to set the action when the received storm control packets exceed the maximum rate on an interface. Use **no** form to restore to default action.

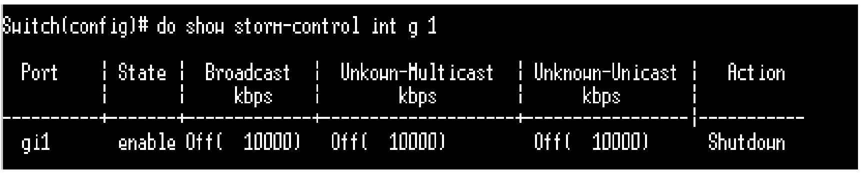
Example

This example shows how to configure storm control action to shutdown port on interface gi1.

```
Switch(config)# interface gi1
Switch(config-if)# storm-control action shutdown
```

This example shows how to show storm control action on interface gi1.

```
Switch# show storm-control interfaces gi1
```



```
Switch(config)# do show storm-control int g 1

 Port     | State |  Broadcast  |  Unkown-Multicast  | Unknown-Unicast |   Action
          |       |    kbps     |       kbps         |      kbps       |
----------+-------+-------------+--------------------+-----------------|-----------
 gi1        enable Off(  10000)  Off(  10000)         Off(  10000)      Shutdown
```

2.30.4 storm-control ifg

Syntax **storm-control ifg (include | exclude)**

Parameter

include	Include preamble & IFG (20 bytes) when count ingress storm control rate.
exclude	Exclude preamble & IFG (20 bytes) when count ingress storm control rate

Default Default storm control inter frame gap is excluded.

Mode Global Configuration

Usage Storm control mechanism will try to calculate ingress packets is exceed configured rate or not and do corresponding action.

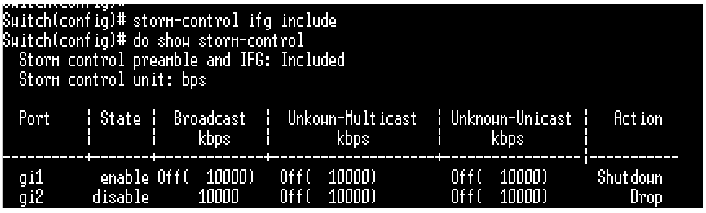
Use storm-control ifg command to include/exclude the preamble and inter frame gap into the calculating.

Example This example shows how to configure storm inter frame gap to include.

```
Switch(config)# storm-control ifg include
```

This example shows how to show storm control global configuration.

```
Switch# show storm-control
```



```
Switch(config)# storm-control ifg include
Switch(config)# do show storm-control
  Storm control preamble and IFG: Included
  Storm control unit: bps

  Port     | State |  Broadcast   |   Unkown-Multicast   | Unknown-Unicast  |   Action
           |       |     kbps     |         kbps         |       kbps       |
-----------+-------+--------------+----------------------+------------------|-----------
  gi1        enable Off(   10000)   Off(   10000)          Off(   10000)      Shutdown
  gi2       disable     10000       Off(   10000)          Off(   10000)          Drop
```

2.30.5 storm-control level

Syntax

storm-control (broadcast | unknown-unicast | unknown-multicast) level<1-1000000>
no storm-control (broadcast | unknown-unicast | unknown multicast) level

Parameter

broadcast	Select broadcast storm control type
unknown-unicast	Select unknown unicast storm control type
unknown-multicast	Select unknown multicast storm control type
level <1-1000000>	Specify the storm control rate for selected type. For bps, range is 16-1000000 For pps, range is 1-262143

Default

Default broadcast storm control rate is 10000.
Default unknown multicast storm control rate is 10000.
Default unknown unicast storm control rate is 10000.

Mode

Interface Configuration

Usage

Each control type is allowed to have different storm control rate.

Use **"storm-control (broadcast|unknown-unicast|unknown-multicast) level"** command to configure it

Use no form to restore to default rate.

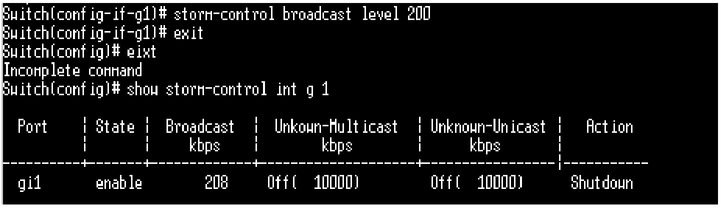
Example

This example shows how to enable broadcast storm control and configure broadcast storm control rate to 200.

```
Switch(config)# interface gi1
Switch(config-if)# storm-control broadcast
Switch(config-if)# storm-control broadcast level 200
```

This example shows how to show current storm control configuration on interface gi1

```
Switch# show storm-control interfaces gi1
```



```
Switch(config-if-g1)# storm-control broadcast level 200
Switch(config-if-g1)# exit
Switch(config)# eixt
Incomplete command
Switch(config)# show storm-control int g 1

 Port    | State | Broadcast | Unkown-Multicast | Unknown-Unicast |   Action
         |       |   kbps    |       kbps       |      kbps       |
---------+-------+-----------+------------------+-----------------|----------
 gi1       enable      208     Off(  10000)       Off(  10000)      Shutdown
```

2.30.6 storm-control unit

Syntax

storm-control unit (bps | pps)

Parameter

bps	Storm control rate calculates by octet-based
pps	Storm control rate calculates by packet-based

Default

Default storm control unit is bps.

Mode

Global Configuration

Usage

Storm control mechanism will try to calculate ingress packets is exceed configured rate or not and do corresponding action.

Use **storm-control unit** command to change the unit of calculating method.

Example

This example shows how to configure storm control rate unit as pps.

```
Switch(config)# storm-control unit pps
```

This example shows how to show storm control global configuration.

```
Switch# show storm-control
```

2.31 System File

2.31.1 boot system

Syntax

boot system (image0 | image1)

Parameter

image0	Boot from flash image partition 0
image1	Boot from flash image partition 1

Default

Default boot image is image.

Mode

Global Configuration

Usage

Dual image allow user to have a backup image in the flash partition. Use **"boot system**" command to select the active firmware image. And another firmware image will become a backup one.

Example

This example shows how to select image1 as active image.

```
Switch(config)# boot system image1
Select "image1" Success
```

This example shows how to show active image partition.

Switch# **show flash**

2.31.2 copy

Syntax

copy (flash:// | tftp://) (flash:// | tftp://)
copy tftp:// (backup-config | running-config | startup-config)
copy (backup-config | running-config | startup-config) tftp://

copy (backup-config | startup-config) running-config copy (backup-config | running-config) startup-config copy (running-config | startup-config) backup-config

flash://	Specify the file stored in flash to operation. Available files are: flash://startup-config flash://backup-config flash://rsa1 flash://rsa2 flash://dsa2 flash://image0 flash://image1 flash://ram.log flash://flash.log

Parameter

tftp://	Specify remote tftp server and remote file name. The format is "tftp://192.168.1.111/remote_file_name"
running-config	Running configuration file
startup-config	Startup configuration file
backup-config	Backup configuration file

Default No default value for this command.

Mode Privileged EXEC

Usage There are many types of files in system. These files are very important for administrator to manage the switch. The most common file operation is copy. By using these copy commands, we can upgrade, backup following type of files.

- Firmware Image
- Configuration Files
- Syslog Files
- Language Files
- Security Certificate

Example This example shows how to copy running configuration to startup configuration.

```
Switch# copy running-config startupst-config
```

This example shows how to backup running configuration to remote tftp server 192.168.111 with file name test1.cfg.

```
Switch# copy running-config tftp://192.168.1.111/
        test1.cfg
Uploading file...Please Wait... Uploading Done
```

This example shows how to upgrade startup configuration from remote tftp server 192.168.1.111 with file name test2.cfg.

```
Switch# copy tftp://192.168.1.111/test2.cfg startup-
       config
Downloading file...Please Wait... Downloading Done
Upgrade config success. Do you want to reboot now?
(y/n)n
```

This example shows how to backup security file dsa2 to remote tftp server 192.168.1.111 with file name dsa2.

```
Switch# copy flash://dsa2 tftp://192.168.1.111/dsa2
```

```
Uploading file...Please Wait...
Uploading Done
```

2.31.3 delete

Syntax

delete (startrup-config | backup-config | flash://)
delete system (image0 | image1)

Parameter

flash://	Specify the configuration file stored in flash to delete. Available files are: flash://startup-config flash://backup-config
startup-config	Delete startup configuration file
backup-config	Delete backup configuration file
image0	Delete flash image0.
image1	Delete flash image1.

Default

No default value for this command.

Mode

Privileged EXEC

Usage

Use "**delete**" command to delete configuration files or use "delete system" command to delete firmware image stored in flash.
The "**delete startup-config**" command is using to restore factory default and it is equal to command "**restore-defaults**".

Example

This example shows how to delete backup configuration file.

```
Switch# delete backup-config
```

This example shows how to delete backup firmware image from flash.

```
Switch# delete system image1
```

This example shows how to show file status in flash.

```
Switch# show flash
```

2.31.4 restore-defaults

Syntax	**restore-defaults [interfaces** IF_PORTS**]**	
Parameter	**interfaces IF_PORTS**	Specify port to restore its' ruuning config
Default	No default value for this command.	
Mode	Privileged EXEC	
Usage	Use "restore-defaults" command to restore factory default of all system. The command is equal to "delete startup-config",	
Example	This example shows how to restore factory defaults. `Switch# restore-defaults`	

2.31.5 save

Syntax	**save**
Parameter	N/A
Default	No default value for this command.
Mode	Privileged EXEC
Usage	Privileged EXEC
Example	Use "**save**" command to save running configuration to startup configuration file. This command is equal to "**copy running-config startup-config**". `Switch# save`

2.31.6 show bootvar

Syntax	**show bootvar**
Parameter	N/A
Default	No default value for this command.
Mode	Privileged EXEC
Usage	Use "**show bootvar**" command to show image information in both flash partitions. It also shows current active image and active image on next booting
Example	This example shows how to show dual image information Switch# show bootvar

2.31.7 show config

Syntax	**show (running-config | startrup-config | backup-config)** **show running-config interfaces** *IF_PORTS*
Parameter	**running-config**: Show running configuration on terminal **startup-config**: Show startup configuration on terminal **backup-config**: Show backup configuration on terminal IF_PORTS: Specify port to show its' ruuning config
Default	No default value for this command.
Mode	Privileged EXEC
Usage	Our configuration file is text based. Therefore, we can show the configuration on terminal and read it by this command. Use "**show config**" command to show configuration files stored in system. Use "**show config interfaces**" command to show specific port configurations.

Example	This example shows how to show startup configuration
	`Switch# show startup-config`
	This example shows how to show running configuration
	`Switch# show running-config`
	This example shows how to display running configuraiton on specific port.
	`Switch# show running-config interfaces gi1`

2.31.8 show flash

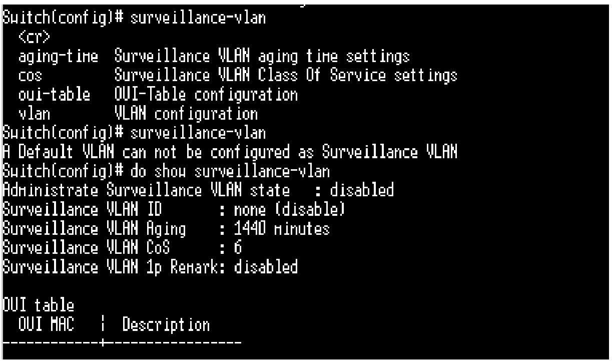
Syntax	**show flash**
Parameter	N/A
Default	No default value for this command.
Mode	Privileged EXEC
Usage	Use "**show flash**" command to show all files' status which stored in flash.
Example	This example shows how to show all files status stored in flash. `Switch#` **`show flash`**

2.32 Surveillance VLAN

2.32.1 surveillance-vlan(Global)

Syntax	**surveillance-vlan** **no surveillance -vlan**
Parameter	N/A
Default	Surveillance VLAN is disabled
Mode	Global Configuration
Usage	Use the **surveillance vlan** global configuration command to enable the functional Surveillance VLAN on the device. Use the no form of this command to disable Surveillance VLAN function. You can verify your setting by entering the **show surveillance vlan Privileged EXEC** command.

Example	The following example shows how to enable Surveillance VLAN.
	`Switch(config)#` **`surveillance -vlan`**
	`Switch#` **`show surveillance -vlan`**



```
Switch(config)# surveillance-vlan
  <cr>
  aging-time  Surveillance VLAN aging time settings
  cos         Surveillance VLAN Class Of Service settings
  oui-table   OUI-Table configuration
  vlan        VLAN configuration
Switch(config)# surveillance-vlan
A Default VLAN can not be configured as Surveillance VLAN
Switch(config)# do show surveillance-vlan
Administrate Surveillance VLAN state   : disabled
Surveillance VLAN ID       : none (disable)
Surveillance VLAN Aging    : 1440 minutes
Surveillance VLAN CoS      : 6
Surveillance VLAN 1p Remark: disabled

OUI table
  OUI MAC    |  Description
------------+----------------
```

2.32.2 surveillance-vlan(Interface)

Syntax

surveillance-vlan
no surveillance-vlan

Parameter

N/A

Default

Disable by default.

Mode

Interface Configuration

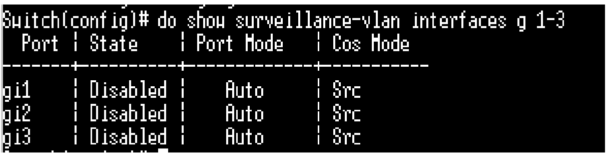
Usage

Use the **surveillance vlan** Interface configuration command to enable OUI surveillance VLAN configuration on an interface
Use the **no** form of this command to disable Surveillance VLAN on an interfaces
You can verify your setting by entering the **show surveillance vlan** Privileged EXEC command

Example

The following example how to enable Surveillance VLAN function in oui mode on an interface

```
Switch(config)#interface range g 1-3
Switch(config-if)#surveillance-vlan
Switch# show surveillance-vlan interfaces g 1-3
```



```
Switch(config)# do show surveillance-vlan interfaces g 1-3
  Port | State    | Port Mode    | Cos Mode
-------+----------+--------------+----------

gi1    | Disabled |    Auto      | Src
gi2    | Disabled |    Auto      | Src
gi3    | Disabled |    Auto      | Src
```

2.32.3 surveillance-vlan vlan

Syntax	**surveillance-vlan vlan <1-4094>** **no surveillance-vlan vlan**
Parameter	<1-4094> Specify the Surveillance VLAN ID
Default	The default Surveillance VLAN ID is None.
Mode	Global Configuration
Usage	Use the **surveillance vlan** id global configuration command to configure the VLAN identifier of the surveillance VLAN statically. Use the **no** form of this command to restore surveillance VLAN id to default. You can verify your setting by entering the **show surveillance vlan Privileged EXEC** command

Example	The following example shows how to set Surveillance VLAN id. The VLAN id must be created first.
	`Switch(config)# surveillance-vlan vlan 128`
	`Switch# show surveillance-vlan`

2.32.4 surveillance-vlan oui-table

Syntax	**surveillance-vlan oui-table** A:B:C [DESCRIPTION] **no surveillance-vlan oui-table** [A:B:C]
Parameter	**A:B:C** Specify OUI Mac address to add or remove **startup-config** Specify description of the specified MAC address to the surveillance VLAN OUI table
Default	Default has no pre-defined OUI.
Mode	Global Configuration
Usage	Use the **surveillance vlan oui-table** global configuration command to add OUI mac address to OUI Table Use the **no** form of this command to remove all or specified OUI mac address. You can verify your setting by entering the show surveillance vlan Privileged EXEC command

Example	This following example shows how to add OUI Mac.
	`Switch(config)# surveillance-vlan oui-table 00:01:02 “Test”`
	`Switch# show surveillance-vlan interfaces g 1-3`

2.32.5 surveillance-vlan cos (Global)

Syntax

surveillance-vlan cos <0-7> [remark]
no surveillance-vlan cos

Parameter

<0-7>	Specify the surveillance VLAN Class of Service value in telephone OUI mode
remark	Specify that the L2 user priority is remarked with the CoS value

Default

The default cos value is 6, remark is disabled.

Mode

Global Configuration

Usage

Use the **surveillance vlan cos** global configurations command to configure the surveillance VLAN cos value and 1p remark function.
Use the "**no**" form to restore to default mode.
You can verify your setting by entering the **show surveillance vlan** Privileged EXEC command

Example

The following example show how to set cos value and enable 1p remark function

```
Switch(config)# surveillance-vlan cos 7 remark
Switch# show surveillance-vlan
```

2.32.6 surveillance-vlan cos (Interface)

Syntax

surveillance-vlan cos (src | all)
no surveillance-vlan cos

Parameter

src	Specify QoS attributes are applied to packets with OUIs in the source MAC address.
All	Specify QoS attributes are applied to packets that are classified to the Surveillance VLAN.

Default

The default all port in Src mode.

Mode

Global Configuration

Usage

Use the surveillance vlan cos mode Interface configuration command to configure OUI surveillance VLAN cos mode configuration on an interface. Use the "no" form to restore to default mode.
You can verify your setting by entering the show surveillance-vlan interfaces Privileged EXEC command

Example

The following example how to configure surveillance packet QoS attributes on an interface

```
Switch(config)#interface range g 1-3
Switch(config-if)#surveillance-vlan cos all
Switch# show surveillance-vlan interfaces g 1-3
Switch# show surveillance-vlan
```

2.32.7 surveillance-vlan mode

Syntax

surveillance-vlan
mode (auto|manual)
no surveillance-vlan mode

Parameter

auto	Specifies that the port is identified as a candidate to join the surveillance VLAN. When a packet with a source OUI MAC address that identifies the remote equipment as surveillance equipment is seen on the port, the port joins the surveillance VLAN as a tagged port.
manual	Specifies that the port is manually assigned to the surveillance VLAN.

Default The default is auto mode.

Mode Interface Configuration

Usage Use the **surveillance-vlan mode** global configuration command to configure the surveillance VLAN mode for interface.
Use the “**no**” form to restore to default mode.
You can verify your setting by entering the **show surveillance-vlan interfaces** Privileged EXEC command.

Example The following example how to configure surveillance mode to manual

```
Switch(config)#interface range fa1-3
Switch(config-if)#surveillance-vlan mode manaul
Switch# show surveillance-vlan interfaces g 1-3
```

2.32.8 surveillance-vlan aging-time

Syntax

surveillance-vlan aing-time <30-65536>
no surveillance-vlan aing-time

Parameter

<30-65536>	Specify the Surveillance VLAN aging timeout interval in minutes

Default

The default aging-timeout value is 1440 minutes

Mode

Global Configuration

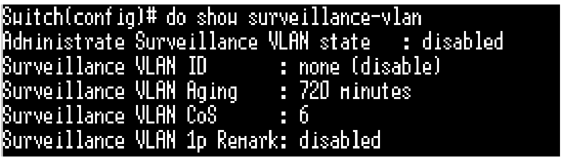
Usage

Use the **surveillance vlan aging-time** global configuration command to configure the surveillance VLAN aging timeout.
Use the “**no**” form to restore to default time.
You can verify your setting by entering the **show surveillance vlan** Privileged EXEC command

Example

The following example shows how to set aging time.

```
Switch(config)# surveillance-vlan aging-time 720
Switch# show surveillance-vlan
```



```
Switch(config)# do show surveillance-vlan
Administrate Surveillance VLAN state   : disabled
Surveillance VLAN ID       : none (disable)
Surveillance VLAN Aging    : 720 minutes
Surveillance VLAN CoS      : 6
Surveillance VLAN 1p Remark: disabled
```

2.32.9 show surveillance-vlan

Syntax

show surveillance-vlan
show surveillance-vlan interfaces [IF_PORTS]

Parameter

IF_PORTS	Specifies interfaces to display surveillance VLAN settings in OUI mode

Default

N/A

Mode

Privileged EXEC

Usage

Use the **show surveillance vlan** command in EXEC mode to display the surveillance VLAN status for all interfaces or for a specific interface if the surveillance VLAN type is OUI

Example

The following example show how to display surveillance vlan OUI mode settings

```
Switch# show surveillance-vlan
```

2.33 Time

2.33.1 clock set

Syntax

clock set HH:MM:SS (jan |feb |mar |apr |may |jun |jul |aug |sep|oct|nov|dec) <1-31> <2000-2035>

Parameter

H:MM:SS (jan|feb|mar|apr |may|jun|jul|aug|sep|oct|nov|dec) <1-31> <2000-2035>	Specify static time of year, month, day, hour, minute, second

Default

No default is defined.
The clock set to 2000/01/01 08:00:00 by default at startup.

Mode

Privileged EXEC

Usage

Use the clock set command to set static time. The static time won't save to configuration file.
You can verify your setting by entering the show clock Privileged EXEC command.

Example

The example shows how to set static time of switch.

```
switch# clock set 11:03:00 sep 21 2012

switch# show clock
```

2.33.2 clock timezone

Syntax

clock timezone ACRONYM HOUR-OFFSET [minutes <0-59>]
no clock timezone

Parameter

ACRONYM	Specify acronym name of time zone
HOUR-OFFSET	Specify hour offset of time zone
Minutes <1-59>	Specify minute offset of time zone

Default

Default time zone is UTC+8.

Mode

Global Configuration

Usage

Use the clock timezone command to set timezone setting.
Use the **no** form of this command to restore to default setting.
You can verify your setting by entering the **show clock detail** Privileged EXEC command.

Example

The example shows how to set time zone of switch and then restore to default time zone.

```
switch(config)# clock timezone test +5
switch(config)# show clock detail
```

2.33.3 clock source

Syntax

clock source (local|sntp)

Parameter

<table>
<tr><td><b>local</b></td><td>Specify to use static time</td></tr>
<tr><td><b>sntp</b></td><td>Specify to use sntp time</td></tr>
</table>

Default

Default is using local time.

Mode

Global Configuration

Usage

Use the clock source command to set the source of time.
Use the no form of this command to restore to default setting.
You can verify your setting by entering the show clock detail Privileged EXEC command.

Example

The example shows how to set clock source of switch.

```
switch(config)# clock source sntp
switch(config)# show clock detail
```

2.33.4 clock summer-time

Syntax

clock summer-time ACRONYM date (jan|feb|mar|apr|may|jun|jul|aug|sep|oct|nov|dec) <1-31> <2000-2037> HH:MM (jan|feb|mar|apr|may|jun|jul|aug|sep|oct|nov|dec) <1-31> <2000-2037> HH:MM [<1-1440>]

clock summer-time ACRONYM recurring (usa|eu) [<1-1440>]

clock summer-time ACRONYM recurring (<1-5>|first|last) (sun|mon|tue|wed|thu|fri|sat) (jan|feb|mar|apr|may|jun|jul|aug|sep|oct|nov|dec) HH:MM (<1-5>|first|last) (sun|mon|tue|wed|thu|fri|sat) (jan|feb|mar|apr|may|jun|jul|aug|sep|oct|nov|dec) HH:MM [<1-1440>]

no clock summer-time

<table>
<tr><td><b>ACRONYM</b></td><td>Specify acronym name of time zone</td></tr>
<tr><td><b>(jan|feb|mar|apr| may|jun|jul|aug|sep| oct|nov|dec) <1-31><2000-2037> HH:MM (jan|feb|mar|apr| may|jun|jul|aug|sep| oct|nov|dec) <1-31> <2000-2037&gt; HH:MM</b></td><td>Specify non-recurring daylight saving time duration.</td></tr>
</table>

Parameter	**<1-1440>**	Specify adjust offset of daylight saving time
	usa	Using daylight saving time in the United States that starts on the second Sunday of March and ends on the first Sunday of November
	eu	Using daylight saving time in the Europe that starts on the last Sunday in March and ending on the last Sunday in October
	(<1-5>|first|last) (sun|mon| tue |wed |thu |fri|sat) (jan|feb|mar|apr| may|jun| jul|aug|sep|oct|nov|dec) HH:MM (<1-5>|first|last) (sun|mon|tue|wed |thu|fri|sat) (jan|feb|mar|apr| may| jun |jul |aug |sep|oct|nov|dec) HH:MM	Specify ecurring daylight saving time duration.
Default	No default daylight saving time is defined.	
Mode	Global Configuration	
Usage	Use the **clock summer-time** command to set daylight saving time for system time. The “**usa**” or “**eu**” means that use the global daylight saving policy which defined by international organization. In both the “**date**”and “**recurring**”, the first part of the command specifies when summer time begins, and the second part specifies when it ends. All times are relative to the local time zone. The “**recurring**” means that adjust time every year within the month. Use the no form of this command to default setting. You can verify your setting by entering the **show clock detail** Privileged EXEC command.	
Example	The example shows how to set clock summer time of switch. You can verify settings by the following show show clock command.	

```
switch(config)# clock summer-time test recurring usa
switch(config)# show clock detail
```

2.33.5 show clock

Syntax **show clock [detail]**

Parameter

detail	Show more detail information of clock

Default No default is defined

Mode Privileged EXEC

Usage Use the **show clock** command to show clock of switch. The “**detail**” means that show more information of clock such as time zone and daylight saving time.

Example The example shows how to show clock of switch and detail information.

```
Switch(config)# clock source sntp
Switch(config)# clock summer-time DLS recurring usa
Switch(config)# sntp host 192.168.1.100
Switch(config)# show clock

Switch(config)# show clock detail
```

2.33.6 sntp

Syntax **sntp host HOSTNAME [port <1-65535>]**
no sntp

Parameter

HOSTNAME	Specify ip address or hostname of sntp server
sntp	Specify server port of sntp server

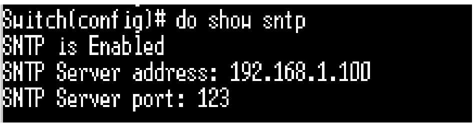
Default No default SNTP server defined. Default server port is 123 when server created.

Mode Global Configuration

Usage Use the sntp command to set remote SNTP server. Use the no form of this command to default setting.
You can verify your setting by entering the **show sntp** Privileged EXEC command.

Example The example shows how to set remote SNTP server of switch.

```
switch(config)# clock source sntp
switch(config)# sntp host 192.168.1.100
switch(config)# show sntp
```



```
Switch(config)# do show sntp
SNTP is Enabled
SNTP Server address: 192.168.1.100
SNTP Server port: 123
```

2.33.7 show sntp

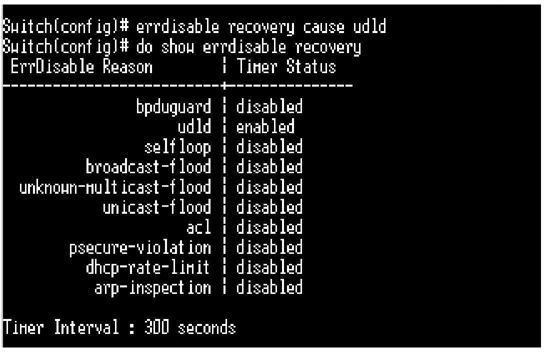
Syntax	**show sntp**
Parameter	None
Default	No default is defined
Mode	Privileged EXEC
Usage	Use the show sntp command to remote SNTP server information.
Example	The example shows how to show remote SNTP server. Switch (config)# show sntp

2.34 UDLD

2.34.1 errdisable recovery cause udld

Syntax	**errdisable recovery cause udld** **no errdisable recovery cause udld**
Parameter	N/A
Default	Error disable auto recovery is disabled by default.
Mode	Global EXEC
Usage	Use the **errdisable recovery cause udld** to enable auto recovery of UniDirectional Link Detection (UDLD). Use the "**no**" to disable it.
Example	The example shows how to enable auto recovery of UniDirectional Link Detection (UDLD).

```
switch(config)# errdisable recovery cause udld
switch# show errdisable recovery
```



```
Switch(config)# errdisable recovery cause udld
Switch(config)# do show errdisable recovery
 ErrDisable Reason         | Timer Status
---------------------------+---------------
                 bpduguard | disabled
                      udld | enabled
                  selfloop | disabled
           broadcast-flood | disabled
   unknown-multicast-flood | disabled
              unicast-flood | disabled
                       acl | disabled
         psecure-violation | disabled
           dhcp-rate-limit | disabled
            arp-inspection | disabled

Timer Interval : 300 seconds
```

2.34.2 udld

Syntax

udld
no udld

Parameter

N/A

Default

UDLD is disabled by default.

Mode

Interface Configuration

Usage

Use the udld command to enable UniDirectional Link Detection (UDLD) normal mode of interface.

Use the **no** form of this command to restore to default setting.

You can verify your setting by entering the **show udld interface** Privileged EXEC command.

Example

The example shows how to enable UniDirectional Link Detection (UDLD) normal mode in interface gi 1.

```
switch(config)# interface gi1
switch(config-if)# udld
```

2.34.3 udld aggressive

Syntax

udld / aggressive no / udld / aggressive

Parameter

N/A

Default

UDLD aggressive mode is disabled by default.

Mode

Interface Configuration

Usage

Use the **udld aggressive** command to enable UniDirectional Link Detection (UDLD) aggressive mode of interface.

Use the no form of this command to restore to default setting.

You can verify your setting by entering the **show udld interface** Privileged EXEC command.

Example

The example shows how to enable udld aggressive mode in interface gi1.

```
switch(config)# interface gi1
switch(config-if)# udld
```

2.34.3 udld message time

Syntax	**udld message time** message-time-interval
Parameter	**message-time-interval** Specify the interval for sending message. Range is 1 -90 seconds.
Default	Default interval is 15 seconds.
Mode	Global Configuration
Usage	Use the udld message time to set interval of UniDirectional Link Detection (UDLD) sent message.
Example	The example shows how to set interval of UniDirectional Link Detection (UDLD) message. `switch(config)# udld message time 30`

2.34.4 udld reset

Syntax	**udld reset**
Parameter	N/A
Default	No default is defined
Mode	Privileged EXEC
Usage	Use the **udld reset** command to reset all interfaces disabled by the UniDirectional Link Detection (UDLD) and permit traffic to begin passing through them again. If the interface configuration is still enabled for UDLD, these ports begin to run UDLD again and are disabled for the same reason if the problem has not been corrected.
Example	The example shows how to reset all interfaces disabled by UDLD `Switch# udld reset`

2.34.5 show udld

Syntax	**show udld** **show udld interfaces** IF_NMLPORTS
Parameter	**IF_NMLPORTS** — Specify the normal interfaces to display udld information
Default	No default is defined
Mode	Privileged EXEC
Usage	Use the show udld command to to display UniDirectional Link Detection (UDLD) administrative and operational status for all ports or the specified port.

Example The example shows how to show UniDirectional Link Detection (UDLD) settings and operational status of interface gi1.

```
Switch(config)# show udld interfaces gi1
```

2.35 VLAN

2.35.1 vlan

Syntax	**vlan / no vlan**
Parameter	N/A
Default	VLAN 1 created by default
Mode	Global Configuration
Usage	Use the vlan global configuration command to create VLAN. Use the no form of this command to remove exist VLAN. You can verify your setting by entering the show vlan Privileged EXEC command.

Example

The following example creates and removes a VLAN entry (100).

```
Switch# configure
Switch (config)# vlan 100
Switch# show vlan
```

2.35.2 Name(vlan)

Syntax	**name NAME**	
Parameter	NAME	Specify the name of the VLAN (Max. 32 chars).
Default	Default name of new vlan is VLANxxxx. Xxxx is 4-digit vlan number.	
Mode	VLAN Configuration	
Usage	Use the vlan global configuration command to create VLAN. Use the no form of this command to remove exist VLAN. You can verify your setting by entering the show vlan Privileged EXEC command.	

Example

This example sets the VLAN name of VLAN 100 to be `VLAN-fiberroad`.

```
Switch(config)# vlan 100
Switch(config-vlan)# name VLAN-fiberroad
Switch# show vlan
```

2.35.3 switchport mode

Syntax **switchport mode (access | hybrid | trunk [uplink] | tunnel)**

Parameter

access	Specify the VLAN mode to Access port.
hybrid	Specify the VLAN mode to Hybrid port.
trunk	Specify the VLAN mode to Trunk port.
uplink	Specify the Uplink property on this Trunk port.
tunnel	Specify the VLAN mode to Dot1Q Tunnel port.

Default Default is trunk mode of all interfaces

Mode Port Configuration

Usage The VLAN mode is used to configure the port for different port role. **Access port**: Accepts only untagged frames and join an untagged VLAN. **Hybrid port**: Support all functions as defined in IEEE 802.1Q specification. **Trunk port**: An untagged member of one VLAN at most, and is a tagged member of zero or more VLANs. If it is an uplink port, it can recognize double tagging on this port.
Tunnel port: Port-based Q-in-Q mode.

Use the **switch mode** port configuration command to set mode of interface You can verify your setting by entering the **show interfaces switchport Privileged EXEC** command.

Example This example sets VLAN mode to Access port.

```
Switch(config)# interface g 12
Switch(config-if)# switchport mode access
Switch# show interfaces switchport g12
```

2.35.4 switchport hybrid pvid

Syntax	**switchport hybrid pvid <1-4094>**	
Parameter	<1-4094>	Specify the port-based VLAN ID on the Hybrid port.
Default	Default pivd is 1.	
Mode	Port Configuration	
Usage	Use the **switch hybrid pivd** port configuration command to set pvid of interface. You can verify your setting by entering the **show interfaces switchport** Privileged EXEC command.	

Example

This example sets PVID to 100.

```
Switch(config)# interface g 10
Switch(config-if)# switchport mode hybrid
Switch(config-if)# switchport hybrid pvid 100
Switch# show interfaces switchport g 10
```

2.35.5 switchport hybrid ingress-filtering

Syntax	**switchport bybrid ingress-filtering no switchport hybrid ingress-filtering**
Parameter	Default is enabled
Default	Port Configuration
Mode	Port Configuration
Usage	Use the switchport hybrid ingress-filtering port configuration command to enable vlan ingress filter. Use the no form of this command to disable. You can verify your setting by entering the s show interfaces switchport Privileged EXEC command.

Example

This example sets ingress-filtering to disable.

```
Switch(config)# interface g 10
Switch(config-if)# switchport mode hybrid
Switch(config-if)# no switchport hybrid ingress-
                   filtering
Switch# show interfaces switchport g 10
```

2.35.6 switchport hybrid acceptable-frame-type

Syntax

switchport hybrid acceptable-frame-type (all | tagged-only | untagged- only)

Parameter

all	Specify to accept all frames.
tagged-only	Specify to only accept tagged frames.
untagged-only	Specify to only accept untagged frames.

Default

Default is accept all frames

Mode

Port Configuration

Usage

Use the **switchport hybrid accept-frame-type** port configuration command to choose which type of frame can be accepted.

You can verify your setting by entering the **show interfaces switchport** Privileged EXEC command

Example

This example sets acceptable-frame-type to tagged-only.

```
Switch(config)# interface g 10
Switch(config-if)# switchport mode hybrid
Switch(config-if)# switchport hybrid acceptable-
                   frame-type tagged- only
Switch# show interfaces switchport g 10
```

2.35.7 switchport hybrid allowed vlan

Syntax

switchport hybrid allowed vlan add VLAN-LIST [(tagged|untagged)]
switchport hybrid allowed vlan remove VLAN-LIST

Parameter

VLAN-LIST	Specifies the VLAN list to be added or remove.
(tagged | untagged)	Specifies the member type is tagged or untagged.

Default

Only vlan 1 is untagged member by default. Default is tagged member when added.

Mode

Port Configuration

Usage

Use the switchport hybrid allow vlan add port configuration command to allow vlan on interface.
Use the switchport hybrid allow vlan remove port configuration command to remove vlan on interface.
You can verify your setting by entering the s show interfaces switchport Privileged EXEC command.

Example

This example sets port fa10 VLAN to join the VLAN 100 as tagged member.

```
Switch (config)# interface fa10
Switch (config-if)# switchport hybrid allowed vlan
                    add 100-105
Switch (config-if)# switchport hybrid allowed vlan
                    remove 105
Switch# show interfaces switchport fa10
```

2.35.8 switchport access vlan

Syntax

switchport access vlan <1-4094> No switchport access vlan

Parameter

<1-4094>	Specifies the access VLAN ID.

Default

Default is vlan 1

Mode

Port Configuration

Usage

Use the **switchport access vlan** port configuration command to set native vlan on interface. The vlan will be pvid on interface as well.
Use the no form of this command to restore to default vlan
You can verify your setting by entering the s show interfaces switchport Privileged EXEC command.

Example

This example sets Access port g 10 native VLAN ID to 100.

```
Switch(config)# interface g 10
Switch(config-if)# switchport mode access
Switch(config-if)# switchport access vlan 100
Switch# show interfaces switchport g 10
```

2.35.9 switchport tunnel vlan

Syntax

switchport tunnel vlan <1-4094>
no switchport tunnel vlan

Parameter

<1-4094>	Specifies the tunnel VLAN ID.

Default

Default is vlan 1

Mode

Port Configuration

Usage

Use the switchport tunnel vlan port configuration command to set dot1q tunnel vlan on interface. The vlan will be pvid on interface as well.
Use the no form of this command to remove vlan on interface. The tunnel vlan id will set to reserve vlan 4095.
You can verify your setting by entering the s show interfaces switchport Privileged EXEC command.

Example

This example sets Tunnel port g 10 native VLAN to 100.

```
Switch(config)# interface fa10
Switch(config-if)# switchport mode tunnel
Switch(config-if)# switchport tunnel vlan 100
Switch# show interfaces switchport
```

2.35.10 switchport trunk native vlan

Syntax

switchport trunk native vlan <1-4094>
no switchport trunk native vlan

Parameter

<1-4094>	Specifies the tunnel VLAN ID.

Default

Default is vlan 1

Mode

Port Configuration

Usage

Use the switchport trunk native vlan port configuration command to set native vlan on interface.
Use the no form of this command to restore to default vlan.
You can verify your setting by entering the s show interfaces switchport Privileged EXEC command.

Example

This example sets Trunk port g 10 native VLAN to 100.

```
Switch(config)# interface g 10
Switch(config-if)# switchport mode trunk
Switch(config-if)# switchport trunk native vlan 100
Switch# show interfaces switchport g 10
```

2.35.11 switchport trunk allowed vlan

Syntax

switchport trunk allowed vlan (add | remove) (VLAN-LIST | all)

Parameter

(add | remove)	Specify the action to add or remove the allowed VLAN list.
(VLAN-LIST | all)	Specify the VLAN list or all VLANs to be added or removed.

Default

N/A

Mode

Port Configuration

Usage

Use the s**witchport trunk allow vlan add** port configuration command to allow vlan on interface.
Use the **switchport trunk allow vlan remove** port configuration command to remove vlan on interface.
You can verify your setting by entering the **show interfaces switchport** Privileged EXEC command.

Example

This example sets Trunk port g10 to add the allowed VLAN 100.

```
Switch(config)# interface g 10
Switch(config-if)# switchport trunk allowed vlan add
                    100
Switch# show interfaces switchport g 10
```

2.35.12 switchport trunk allow vlan

Syntax	**switchport trunk allowed vlan (add | remove) (VLAN-LIST |all)**
Parameter	(add | remove): Specify the action to add or remove the allowed VLAN list. (VLAN-LIST | all): Specify the VLAN list or all VLANs to be added or removed.
Default	N/A
Mode	Port Configuration
Usage	Use the **switchport trunk allow vlan** add port configuration command to allow vlan on interface. Use the **switchport trunk allow vlan** remove port configuration command to remove vlan on interface. You can verify your setting by entering the **show interfaces switchpor**t Privileged EXEC command.
Example	This example sets Trunk port fa10 to add the allowed VLAN 100.

```
Switch(config)# interface g 10
Switch(config-if)# switchport trunk allowed vlan
                   add 100
Switch# show interfaces switchport g 10
```

2.35.13 switchport default-vlan tagged

Syntax	**switchport default-vlan tagged** **no switchport default-vlan tagged**
Parameter	None
Default	Default is untagged
Mode	Port Configuration
Usage	Use the **switchport default vlan tagged** port configuration command to become default vlan tagged member. Use the **no switchport default vlan tagged** port configuration command to restore to default You can verify your setting by entering the **show interfaces switchport** Privileged EXEC command
Example	This example sets Trunk port fa10 membership with the default VLAN to tag.

```
Switch(config)# interface g 10
Switch(config-if)# switchport default-vlan tagged
Switch# show interfaces switchport g 10
```

2.35.14 switchport forbidden default-vlan

Syntax	**switchport forbidden default-vlan** **no switchport forbidden default-vlan**
Parameter	None
Default	Default is allowed
Mode	Port Configuration
Usage	Use the **switchport forbidden default-vlan** port configuration command to forbid default-vlan on interface. Use the **no switchport forbidden default-vlan** port configuration c command to restore to default You can verify your setting by entering the **show interfaces switchport** Privileged EXEC command
Example	This example sets the membership of the default VLAN with port g 10 to forbidden.

```
Switch(config)# interface g 10
Switch(config-if)# switchport forbidden default-
                    vlan
Switch# show interfaces switchport g 10
```

2.35.15 switchport forbidden vlan

Syntax	**switchport forbidden vlan (add | remove) VLAN-LIST**
Parameter	(add | remove) Add or remove forbidden membership. (VLAN-LIST | all) Specify the VLAN list.
Default	No vlan is forbidden by default
Mode	Port Configuration
Usage	Use the **switchport forbidden vlan add** port configuration command to forbid vlan on interface. Use the **switchport forbidden vlan** remove port configuration command to accpet vlan on interface. You can verify your setting by entering the **show interfaces switchport** Privileged EXEC command
Example	This example sets the membership of the VLAN 100 with port fa10 to forbidden.

```
Switch(config)# interface g 10
Switch (config-if)# switchport forbidden vlan add
                    100
Switch# show interfaces switchport g 10
```

2.35.16 switchport vlan tpid

Syntax	**switchport vlan tpid (0x8100|0x88a8|0x9100|0x9200)**
Parameter	(0x8100|0x88a8|0x9100|0x9200) Select TPID to set.
Default	Default TPID is 0x8100
Mode	Port Configuration
Usage	Use the **switchport vlan tpid** port configuration command to set TPID on interface. You can verify your setting by entering the **show running-config** Privileged EXEC command

Example	This example sets the TPID to 0x9100 on interface fa10.
	`Switch(config)# interface fa10`
	`Switch(config-if)# switchport vlan tpid 0x9100`

2.35.17 management-vlan

Syntax	**management-vlan vlan <1-4094>** **no management-vlan**
Parameter	<1-4094> Specify the VLAN ID of management-vlan.
Default	Default management vlan is 1.
Mode	Global Configuration
Usage	Use the management vlan Global Configuration mode command to set management vlan id. Vlan id must be created first. Use the **no** form of this command to restore to default setting. You can verify your setting by entering the show management-vlan Privileged EXEC command

Example	(1)The following example specifies that management vlan 2 is created Switch(config)#vlan 2
	`Switch(config)# management-vlan vlan 2`
	(2) The following example specifies that management-vlan is restored to be default VLAN.
	`Switch(config)# no management-vlan`

2.35.18 show vlan

Syntax	**show vlan [(VLAN-LIST|dynamic|static)]**	
Parameter	(VLAN-LIST|dynamic|static)	Specify vlan id to show information or show all static or dynamic vlan entries.
Default	None	
Mode	Privileged EXEC	
Usage	Display information about vlan entry	
Example	The following example specifies that show vlan Switch# show vlan	

```
Switch# show vlan
```

2.35.19 show vlan interface membership

Syntax	**show vlan VLAN-LIST interfaces IF_PORTS membership**	
Parameter	<VLAN-List>	Specify vlan to show
	IF_PORTS	Specify interface is to show
Default	None	
Mode	Privileged EXEC	
Usage	Display information about vlan membership on interfaces.	
Example	The following example specifies that show vlan interface membership.	

```
Switch# show vlan 100 interfaces fa10 membership
```

2.35.20 show interface switchport

Syntax	**show interface switchport interfaces** IF_PORTS	
Parameter	IF_PORTS	Specify interfaces protocol vlan to display
Default	None	
Mode	Privileged EXEC	
Usage	Display information about default vlan	
Example	The following example specifies that show interfacce switchport.	

```
Switch(config)# interface g 10
Switch(config-if)# switchport trunk allowed vlan
                    add 100
Switch# show interfaces switchport fa10
```

2.35.21 show management-vlan

Syntax	**show management-vlan**
Parameter	None
Default	None
Mode	Privileged EXEC
Usage	Display information about management vlan
Example	The following example specifies that show management vlan `Switch(config)# show management-vlan`

2.36 Voice VLAN

2.36.1 voice-vlan(Global)

Syntax	**voice-vlan / no voice-vlan**
Parameter	None
Default	Voice VLAN is disabled
Mode	Global Configuration
Usage	Use the voice vlan global configuration command to enable the functional Voice VLAN on the device. Use the no form of this command to disable voice vlan function. You can verify your setting by entering the show voice vlan Privileged EXEC command.

Example	The following example shows how to enable voice vlan.
	`Switch(config)# voice-vlan`
	`Switch# show voice-vlan`

2.36.2 voice-vlan(Interface)

Syntax **voice-vlan / no voice-vlan**

Parameter None

Default The default all port admin-staus is disabled.

Mode Interface Configuration

Usage Use the **voice vlan** Interface configuration command to enable OUI voice VLAN configuration on an interface
Use the **no** form of this command to disable voice vlan on an interfaces You can verify your setting by entering the **show voice vlan** Privileged EXEC command

Example The following example how to enable voice VLAN function in oui mode on an interface

```
Switch(config)#interface range g 1-3
Switch(config-if)#voice-vlan
Switch# show voice-vlan interfaces g 1-3
```

2.36.3 voice-vlan vlan

Syntax **voice-vlan vlan <1-4094>**
no voice-vlan vlan

Parameter <1-4094> Specify the voice VLAN ID

Default The default Voice VLAN ID is None.

Mode Global Configuration

Usage Use the voice vlan id global configuration command to configure the VLAN identifier of the voice VLAN statically.
Use the no form of this command to restore voice vlan id to default. You can verify your setting by entering the show voice vlan Privileged EXEC command

Example The following example shows how to set Voice vlan id. The vlan id must be created first.

```
Switch(config)# voice-vlan vlan 128
Switch# show voice-vlan
```

2.36.4 voice-vlan oui-table

Syntax

voice-vlan oui-table A:B:C [DESCRIPTION]
no voice-vlan oui-table [A:B:C]

Parameter

IF_PORTS	Specify interfaces protocol vlan to display
DESCRIPTION	Specify description of the specified MAC address to the voice VLAN OUI table

Default

The system default has 8 oui addresses.

Mode

Global Configuration

Usage

Use the voice vlan oui-table global configuration command to add oui mac address to OUI Table
Use the no form of this command to remove all or specified oui mac address.. You can verify your setting by entering the show voice vlan Privileged EXEC command

Example

This following example shows how to add OUI Mac.

```
Switch(config)# voice-vlan oui-table 00:01:02
                “Test”
Switch# show voice-vlan interfaces all
```

2.36.5 voice-vlan cos(Global)

Syntax

voice-vlan cos <0-7> [remark]
no voice-vlan cos

Parameter

<0-7>	Specify the voice VLAN Class of Service value in telephone oui mode
remark	Specify that the L2 user priority is remarked with the CoS value

Default

The default cos value is 6, remark is disabled.

Mode

Global Configuration

Usage

Use the **voice vlan cos** global configuration command to configure the voice VLAN cos value and 1p remark function
Use the “**no**” form to restore to default mode.
You can verify your setting by entering the s**how voice vlan** Privileged EXEC command

Example

The following example show how to set cos value and enable 1p remark function

```
Switch(config)# voice-vlan cos 7 remark
Switch# show voice-vlan
```

2.36.6 voice-vlan cos(Interface)

Syntax

voice-vlan cos (src | all)
no voice-vlan cos

Parameter

src	Specify QoS attributes are applied to packets with OUIs in the source MAC address.
All	Specify QoS attributes are applied to packets that are classified to the Voice VLAN.

Default

The default all port in Src mode.

Mode

Interface Configuration

Usage

Use the **voice vlan cos Interface configuration** command to configure OUI voice VLAN cos mode configuration on an interface

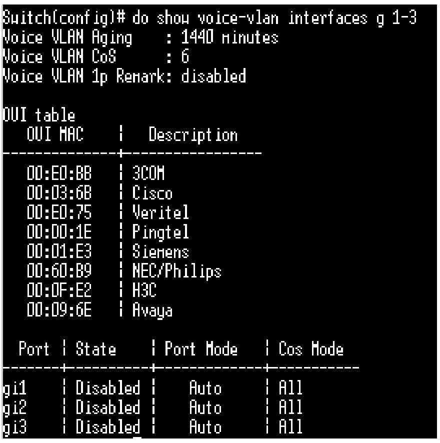
Use the "**no**" form to restore to default mode.

You can verify your setting by entering the s**how voice-vlan interfaces** Privileged EXEC command

Example

The following example how to configure voice packet QoS attributes on an interface

```
Switch(config)#interface range g 1-3
Switch(config-if)#voice-vlan cos all
Switch# show voice-vlan interfaces g 1-3
```



```
Switch(config)# do show voice-vlan interfaces g 1-3
Voice VLAN Aging    : 1440 minutes
Voice VLAN CoS      : 6
Voice VLAN 1p Remark: disabled

OUI table
   OUI MAC     ¦   Description
---------------+-----------------
   00:E0:BB    ¦ 3COM
   00:03:6B    ¦ Cisco
   00:E0:75    ¦ Veritel
   00:D0:1E    ¦ Pingtel
   00:01:E3    ¦ Siemens
   00:60:B9    ¦ NEC/Philips
   00:0F:E2    ¦ H3C
   00:09:6E    ¦ Avaya

  Port ¦ State    ¦ Port Mode    ¦ Cos Mode
-------+----------+--------------+-----------
gi1    ¦ Disabled ¦    Auto      ¦ All
gi2    ¦ Disabled ¦    Auto      ¦ All
gi3    ¦ Disabled ¦    Auto      ¦ All
```

2.36.7 voice-vlan mode

Syntax

voice-vlan mode (auto|manual)
no voice-vlan mode

Parameter

auto	Specifies that the port is identified as a candidate to join the voice VLAN. When a packet with a source OUI MAC address that identifies the remote equipment as voice equipment is seen on the port, the port joins the voice VLAN as a tagged port.
manual	Specifies that the port is manually assigned to the voice VLAN.

Default

The default is auto mode.

Mode

Interface Configuration

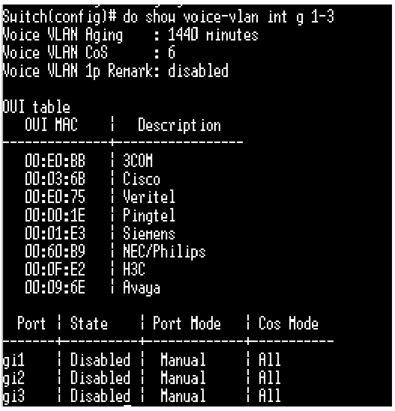
Usage

Use the **voice-vlan mode** global configuration command to configure the voice VLAN mode for interface.
Use the "**no**" form to restore to default mode.
You can verify your setting by entering the **show voice-vlan interfaces** Privileged EXEC command.

Example

The following example how to configure voice mode to manual

```
Switch(config)#interface range g 1-3
Switch(config-if)#voice-vlan mode manaul
Switch# show voice-vlan interfaces g 1-3
```



```
Switch(config)# do show voice-vlan int g 1-3
Voice VLAN Aging    : 1440 minutes
Voice VLAN CoS      : 6
Voice VLAN 1p Remark: disabled

OUI table
   OUI MAC     |   Description
---------------+-----------------
   00:E0:BB    | 3COM
   00:03:6B    | Cisco
   00:E0:75    | Veritel
   00:D0:1E    | Pingtel
   00:01:E3    | Siemens
   00:60:B9    | NEC/Philips
   00:0F:E2    | H3C
   00:09:6E    | Avaya

  Port | State     | Port Mode    | Cos Mode
-------+-----------+--------------+----------
gi1    | Disabled |  Manual       | All
gi2    | Disabled |  Manual       | All
gi3    | Disabled |  Manual       | All
```

2.36.8 voice-vlan aging-time

Syntax

voice-vlan aing-time <30-65536>
no voice-vlan aing-time

Parameter

<30-65536>	Specify the voice VLAN aging timeout interval in minutes

Default

The default aging-timeout value is 1440 minutes

Mode

Global Configuration

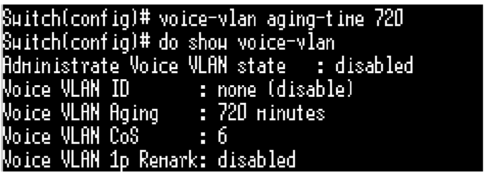
Usage

Use the **voice vlan aging-time** global configuration command to configure the voice VLAN aging timeout.
Use the “no” form to restore to default time.
You can verify your setting by entering the **show voice vlan** Privileged EXEC command

Example

The following example shows how to set aging time.

```
Switch(config)# voice-vlan aging-time 720
Switch# show voice-vlan
```



```
Switch(config)# voice-vlan aging-time 720
Switch(config)# do show voice-vlan
Administrate Voice VLAN state   : disabled
Voice VLAN ID         : none (disable)
Voice VLAN Aging      : 720 minutes
Voice VLAN CoS        : 6
Voice VLAN 1p Remark: disabled
```

2.36.9 show voice-vlan

Syntax

show voice-vlan
show voice-vlan interfaces [IF_PORTS]

Parameter

IF_PORTS	Specifies intefaces to display voice VLAN settings in oui mode

Default

N/A

Mode

Privileged EXEC

Usage

Use the show voice vlan command in EXEC mode to display the voice VLAN status for all interfaces or for a specific interface if the voice VLAN type is OUI

Example

The following example show how to display voice vlan oui mode settings

```
Switch# show voice-vlan
```

2.37 Static Routing

2.37.1 IPv4 Interface

Syntax

interface vlan
ip address ipaddr mask
no interface vlan
no ip address

Parameter

ipaddr	Specify IPv4 address for switch
mask	Specify net mask address for switch

Default

The vlan interface and ip address are not configured by default.

Mode

Global configuration and vlan interface configuration.

Usage

Use the **interface vlan** global configuration command to config ip interface on the device.

Use the **ip address** command in vlan interface mode to configure the device's ip address.

Use the **no ip address** command to delete the configured ip address.

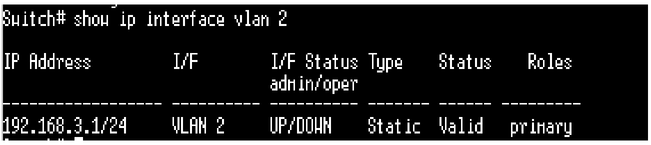
Use the **no interface vlan** command to delete ip interface on the device.

You can verify your setting by entering the **show ip interface vlan** Privileged EXEC command.

Example

The following example shows how to config ip interface.

```
Switch(config)# interface vlan 2
Switch(config-if)# ip address 192.168.3.1
                      255.255.255.0
Switch# show ip interface vlan 2
```



```
Switch# show ip interface vlan 2

IP Address          I/F         I/F Status Type    Status    Roles
                                admin/oper
------------------- ----------- ---------- ------- ------ ---------
192.168.3.1/24      VLAN 2      UP/DOWN    Static  Valid   primary
```

2.37.2 IPv4 Routes

Syntax

ip route dest-ipaddr mask router-ipaddr
no ip route dest-ipaddr mask router-ipaddr

Parameter

Dest-ipaddr	Destination ip address prefix
mask	Destination ip address prefix mask
router-ipaddr	Forwarding router's ip address

Default

Static route is not configured by default.

Mode

Global configuration

Usage

Use the **ip route** command in global mode to configure a static route rule.
Use the **no ip route** command to delete a static routing rule.
You can verify your setting by entering the **show ip route** Privileged EXEC command

Example

The following example shows how to configure a static route.

```
Switch(config)# vlan 2
Switch(config)# interface GigabitEthernet 4
Switch(config-if)# switchport trunk allowed vlan
                     add 2
Switch(config)# interface vlan 2
Switch(config-if)# ip address 192.168.3.1
                   255.255.255.0
Switch(config)# ip route 1.1.1.1 255.0.0.0
                192.168.3.11
Switch# show ip route
```

2.37.3 IPv4 ARP

Syntax

arp ip-addr mac-addr vlan vlanid
no arp ip-addr mac-addr vlan vlanid

Parameter

ip-addr	IP address of ARP entry
mac-addr	MAC address of ARP entry
vlanid	Vlan ID of this arp entry

Default

The device contains ARP entries of the vlan interface.

Mode

Global configuration

Usage

Use the **arp** command to add a static arp entry.
Use the **no arp** command to delete a static arp entry.
You can verify your setting by entering the **show arp** Privileged EXEC command

Example

The following example shows how to configure and view a static arp entry.

```
Switch(config)# arp 192.168.3.22 00:00:11:11:11:11
                vlan 2
Switch# show arp
```

2.37.4 IPv6 Interface

Syntax

interface vlan vlanid
ipv6 enable
no interface vlan vlanid
no ipv6 enable

Parameter

vlanid	Vlan id for vlan interface

Default

The vlan interface are not configured by default.Ipv6 is disabled.

Mode

Global configuration and vlan interface configuration.

Usage

Use the **interface vlan** global configuration command to config ip interface on the device.
Use the **ipv6 enable** command in vlan interface mode to enable ipv6 function.
Use the **no ipv6 enable** command to disable ipv6 function.
Use the **no interface vlan** command to delete ip interface on the device.
You can verify your setting by entering the **show ipv6 interface vlan** Privileged EXEC command.

Example

The following example shows how to config ip interface.

```
Switch(config)# interface vlan 2
Switch(config-if)# ipv6 enable
Switch# show ipv6 interface vlan 2
```

2.37.5 IPv6 Address

Syntax

ipv6 address ipv6-addr
no ipv6 address

Parameter

ipv6-addr	Manually configured ipv6 address

Default

The vlan interface are not configured by default.Ipv6 is disabled.

Mode

Global configuration and vlan interface configuration.

Usage

Use the **ipv6 address** command in vlan interface mode to config a manual ipv6 address.

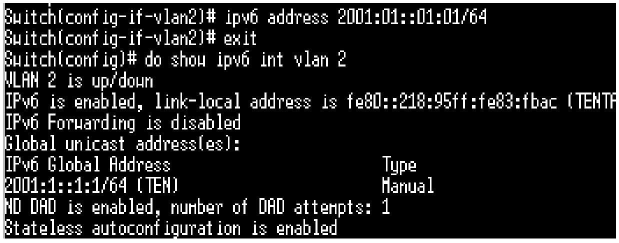
Use the **no ipv6 address** command in vlan interface mode to delete all manual ipv6 addresses on this vlan interface.

You can verify your setting by entering the **show ipv6 interface vlan** Privileged EXEC command.

Example

The following example shows how to config ip interface.

```
Switch(config)# interface vlan 2
Switch(config-if)# ipv6 address 2001:01::01:01/64
 Switch# show ipv6 interface vlan 2
```



```
Switch(config-if-vlan2)# ipv6 address 2001:01::01:01/64
Switch(config-if-vlan2)# exit
Switch(config)# do show ipv6 int vlan 2
VLAN 2 is up/down
IPv6 is enabled, link-local address is fe80::218:95ff:fe83:fbac (TENTA
IPv6 Forwarding is disabled
Global unicast address(es):
IPv6 Global Address                          Type
2001:1::1:1/64 (TEN)                         Manual
ND DAD is enabled, number of DAD attempts: 1
Stateless autoconfiguration is enabled
```

2.37.6 IPv6 Routes

Syntax

ipv6 route ipv6-addr/length route-ipv6-addr
no ipv6 address ipv6-addr/length

Parameter

ipv6-addr/length	Destination ipv6 prefix and length
route-ipv6-addr	Forwarding router's ipv6 address

Default

The ipv6 routing entry is not configured by default.

Mode

Global configuration and vlan interface configuration.

Usage

Use the **ipv6 route** command to configure a static ipv6 routing entry.
Use the **no ipv6 address** command to delete a static ipv6 routing entry.
You can verify your setting by entering the **show ipv6 route static** Privileged EXEC command.

Example

The following example shows how to configure an ipv6 routing entry.

```
Switch(config)# ipv6 route 2002:01::01:01/96
                2001:01::01:02
Switch# show ipv6 route static
```

2.37.7 IPv6 Neighbors

Syntax

ipv6 neighbor ipv6-addr vlan vlanid macaddr
no ipv6 neighbor

Parameter

ipv6-addr	Neighbor ipv6 address
vlanid	Vlan interface number
macaddr	MAC address of ipv6 neighbor entry

Default

No ipv6 neighbor address by default.

Mode

Global configuration

Usage

Use the **ipv6 neighbor** command to configure a static ipv6 neighbor entry.
Use the **no ipv6 neighbor** command to delete ipv6 neighbor entry.
You can verify your setting by entering the **show ipv6 neighbors** Privileged EXEC command.

Example

The following example shows how to configure an ipv6 neighbor entry.

```
Switch(config)# ipv6 neighbor 2001:01::01:11 vlan 2
                 00:00:00:11:11:12
Switch# show ipv6 neighbors
```

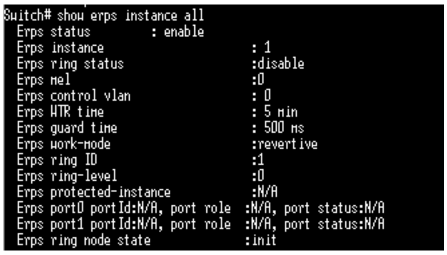
2.38 ERPS

2.38.1 erps global

Syntax	**erps** **no erps**
Parameter	N/A
Default	Default is disable
Mode	Global configuration
Usage	Use the **erps** command to configure erps enable. You can verify your setting by entering the **show running-configuration** Privileged EXEC command.
Example	The following example shows how to configure enable erps in global configuration. `Switch(config)# erps`

2.38.2 erps instance(Global)

Syntax	**erps instance <0-15>** **no erps instance <0-15>**
Parameter	<0 -15> erps instance number
Default	N/A
Mode	Global configuration
Usage	Use the **erps instance** command to configure erps instance. You can verify your setting by entering the **show erps instance(|0-15|all|)>**Privileged EXEC command.

Example	The following example shows how to configure erps instance in global configuration.
	`Switch(config)# erps instance 1`
	`Switch # show erps instance all`
	

```
Switch# show erps instance all
  Erps status          : enable
  Erps instance                        : 1
  Erps ring status                     :disable
  Erps mel                             :0
  Erps control vlan                    : 0
  Erps WTR time                        : 5 min
  Erps guard time                      : 500 ms
  Erps work-mode                       :revertive
  Erps ring ID                         :1
  Erps ring-level                      :0
  Erps protected-instance              :N/A
  Erps port0 portId:N/A, port role   :N/A, port status:N/A
  Erps port1 portId:N/A, port role   :N/A, port status:N/A
  Erps ring node state               :init
```

2.38.3 control-vlan

Syntax

control-vlan <1-4094>
no control-vlan

Parameter

<1-4094>	Specify the control vlan ID. The valid range is from 1 to 4094

Default

N/A

Mode

erps instance configuration

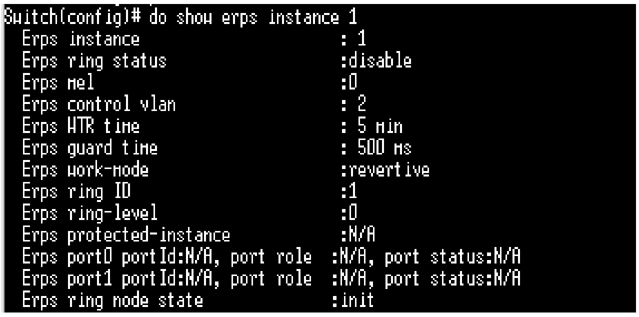
Usage

Use the **erps control-vlan** command to configure the control vlan to the erps instance .
You can verify your setting by entering the **show erps instance** Privileged EXEC command.

Example

The following example shows how to configure control vlan in erps instance global configuration.

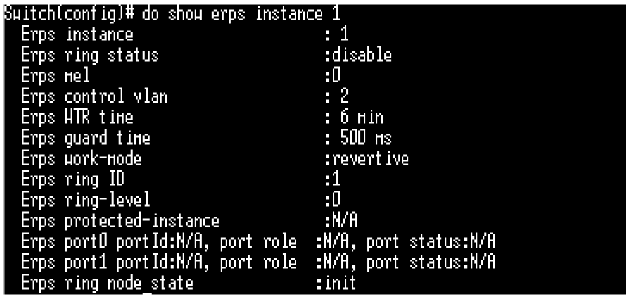
```
Switch(config)# erps instance 1
Switch(config-erps-inst)# control-vlan 2
Switch(config)# do show erps instance 1
```



```
Switch(config)# do show erps instance 1
  Erps instance                            : 1
  Erps ring status                         :disable
  Erps mel                                 :0
  Erps control vlan                        : 2
  Erps HTR time                            : 5 min
  Erps guard time                          : 500 ms
  Erps work-mode                           :revertive
  Erps ring ID                             :1
  Erps ring-level                          :0
  Erps protected-instance                  :N/A
  Erps port0 portId:N/A, port role        :N/A, port status:N/A
  Erps port1 portId:N/A, port role        :N/A, port status:N/A
  Erps ring node state                    :init
```

2.38.4 wtr-timer

Syntax	**wtr-timer <1-12>** **no wtr-timer**	
Parameter	<1-12>	Specify the wtr-timer 1-12. The valid range is from 1 to 12
Default	Default is 5 min	
Mode	erps configuration	
Usage	Use the **wtr-timer** command to configure the WTR to the erps instance . You can verify your setting by entering the **show erps instance** Privileged EXEC command.	
Example	The following example shows how to configure erps **wtr-timer** in erps instance. Switch(config)# **erps instance 1** Switch(config-erps-inst)# **wtr-timer 6** Switch(config)# **do show erps instance 1**	



```
Switch(config)# do show erps instance 1
  Erps instance                     : 1
  Erps ring status                  :disable
  Erps mel                          :0
  Erps control vlan                 : 2
  Erps WTR time                     : 6 min
  Erps guard time                   : 500 ms
  Erps work-mode                    :revertive
  Erps ring ID                      :1
  Erps ring-level                   :0
  Erps protected-instance           :N/A
  Erps port0 portId:N/A, port role  :N/A, port status:N/A
  Erps port1 portId:N/A, port role  :N/A, port status:N/A
  Erps ring node state              :init
```

2.38.5 guard-timer

Syntax

guard-timer <100-2000>
no guard-timer

Parameter

<100-2000> Specify the guard-timer 100-2000 ms.

Default

Default is 500 ms

Mode

erps configuration

Usage

Use the **guard-timer** command to configure the guard-timer to the erps instance .

You can verify your setting by entering the **show erps instance** Privileged EXEC command.

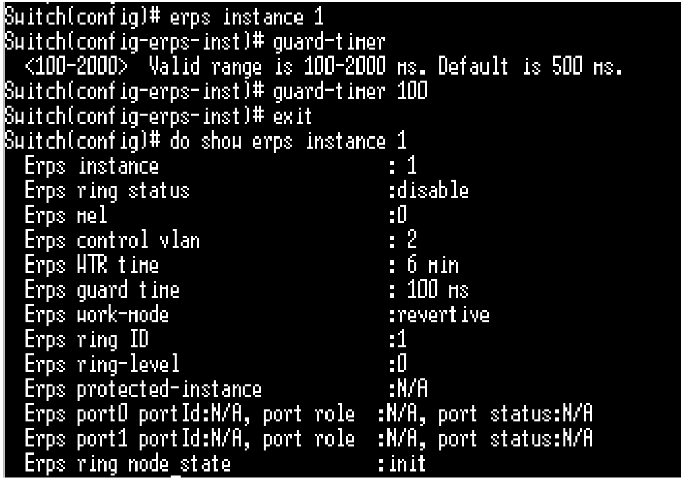
Example

The following example shows how to configure erps **guard-timer** in erps instance.

Switch(config)# **erps instance 1**

Switch(config-erps-inst)# **guard-timer 6**

Switch(config)# **do show erps instance 1**



```
Switch(config)# erps instance 1
Switch(config-erps-inst)# guard-timer
  <100-2000>  Valid range is 100-2000 ms. Default is 500 ms.
Switch(config-erps-inst)# guard-timer 100
Switch(config-erps-inst)# exit
Switch(config)# do show erps instance 1
  Erps instance                       : 1
  Erps ring status                    :disable
  Erps mel                            :0
  Erps control vlan                   : 2
  Erps WTR time                       : 6 min
  Erps guard time                     : 100 ms
  Erps work-mode                      :revertive
  Erps ring ID                        :1
  Erps ring-level                     :0
  Erps protected-instance             :N/A
  Erps port0 portId:N/A, port role  :N/A, port status:N/A
  Erps port1 portId:N/A, port role  :N/A, port status:N/A
  Erps ring node_state              :init
```

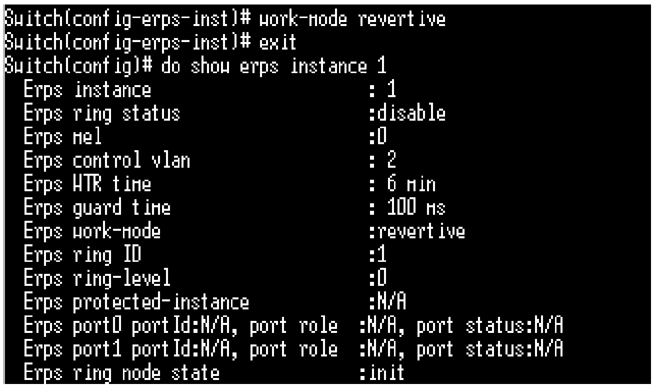
2.38.6 work-mode

Syntax	**work-mode (revertive|non_revertive)**
Parameter	N/A
Default	Default is revertive
Mode	erps configuration
Usage	Use the **work-mode** command to configure the (revertive|non_revertive) to the erps instance . You can verify your setting by entering the **show erps instance** Privileged EXEC command.

Example

The following example shows how to configure erps **work-mode** in erps instance.

```
Switch(config)# erps instance 1
Switch(config-erps-inst)# word-mode revertive
Switch(config)# do show erps instance 1
```



```
Switch(config-erps-inst)# work-mode revertive
Switch(config-erps-inst)# exit
Switch(config)# do show erps instance 1
  Erps instance                      : 1
  Erps ring status                   :disable
  Erps mel                           :0
  Erps control vlan                  : 2
  Erps WTR time                      : 6 min
  Erps guard time                    : 100 ms
  Erps work-mode                     :revertive
  Erps ring ID                       :1
  Erps ring-level                    :0
  Erps protected-instance            :N/A
  Erps port0 portId:N/A, port role  :N/A, port status:N/A
  Erps port1 portId:N/A, port role  :N/A, port status:N/A
  Erps ring node state              :init
```

2.38.7 ring<ID>

Syntax **ring(1-239)**

Parameter <1-239> Specify the ring ID 1-239.

Default Default Ring ID is 1

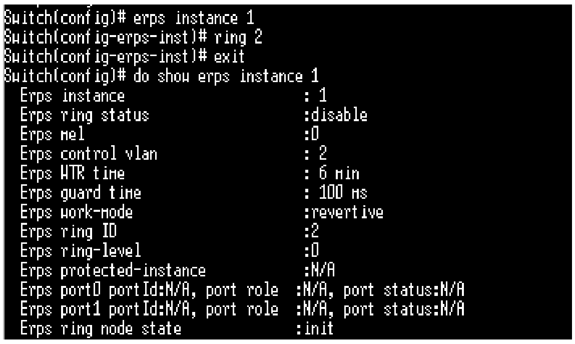
Mode erps configuration

Usage Use the **ring<1-239>** command to configure the ring ID to the erps instance .

You can verify your setting by entering the **show erps instance** Privileged EXEC command.

Example The following example shows how to configure erps **ring id** in erps instance.

```
Switch(config)# erps instance 1
Switch(config-erps-inst)# ring 2
Switch(config)# do show erps instance 1
```



```
Switch(config)# erps instance 1
Switch(config-erps-inst)# ring 2
Switch(config-erps-inst)# exit
Switch(config)# do show erps instance 1
  Erps instance                          : 1
  Erps ring status                       :disable
  Erps mel                               :0
  Erps control vlan                      : 2
  Erps WTR time                          : 6 min
  Erps guard time                        : 100 ms
  Erps work-mode                         :revertive
  Erps ring ID                           :2
  Erps ring-level                        :0
  Erps protected-instance                :N/A
  Erps port0 portId:N/A, port role      :N/A, port status:N/A
  Erps port1 portId:N/A, port role      :N/A, port status:N/A
  Erps ring node state                  :init
```

2.38.8 ring level

Syntax **ring-level<0-1>**

Parameter <0-1> Specify the ring level. Major ring is ring level 0, sub-ring is ring level 1.

Default Default ring level is 0

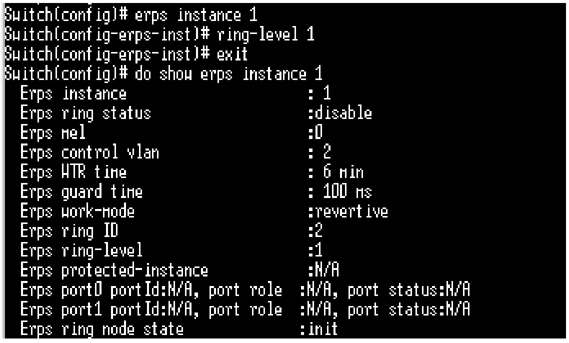
Mode erps configuration

Usage Use the **ring level** command to configure the ring level to the erps instance .

You can verify your setting by entering the **show erps instance** Privileged EXEC command.

Example The following example shows how to configure erps **ring level** in erps instance.

```
Switch(config)# erps instance 1
Switch(config-erps-inst)# ring-level 1
Switch(config)# do show erps instance 1
```



```
Switch(config)# erps instance 1
Switch(config-erps-inst)# ring-level 1
Switch(config-erps-inst)# exit
Switch(config)# do show erps instance 1
  Erps instance                           : 1
  Erps ring status                        :disable
  Erps mel                                :0
  Erps control vlan                       : 2
  Erps WTR time                           : 6 min
  Erps guard time                         : 100 ms
  Erps work-mode                          :revertive
  Erps ring ID                            :2
  Erps ring-level                         :1
  Erps protected-instance                 :N/A
  Erps port0 portId:N/A, port role      :N/A, port status:N/A
  Erps port1 portId:N/A, port role      :N/A, port status:N/A
  Erps ring node state                  :init
```

2.38.9 port

Syntax

port0 IF_PORTS (owner|neihbour|next-neighbour)
port1 IF_PORTS (owner | neihbour | next-neighbour)

Parameter

IF_PORTS Specify the port number.

Default

Default is port1

Mode

erps configuration

Usage

Use the **port0 IF_PORTS (owner|neihbour|next-neighbour)** command to configure the specific port role the erps instance . You can verify your setting by entering the **show erps instance** Privileged EXEC command.

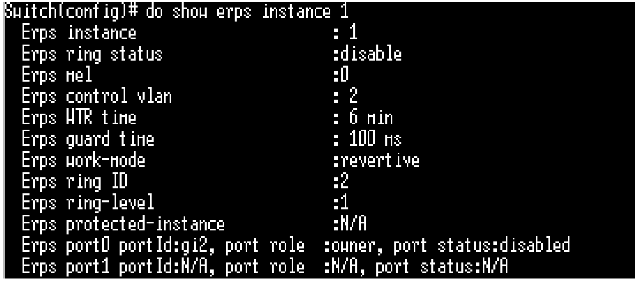
Example

The following example shows how to configure the specific port role in erps instance.

Switch(config)# **erps instance 1**

Switch(config-erps-inst)# **port0 GigabitEthernet 2 owner**

Switch(config)# **do show erps instance 1**



```
Switch(config)# do show erps instance 1
  Erps instance                         : 1
  Erps ring status                      :disable
  Erps mel                              :0
  Erps control vlan                     : 2
  Erps WTR time                         : 6 min
  Erps guard time                       : 100 ms
  Erps work-mode                        :revertive
  Erps ring ID                          :2
  Erps ring-level                       :1
  Erps protected-instance               :N/A
  Erps port0 portId:gi2, port role     :owner, port status:disabled
  Erps port1 portId:N/A, port role     :N/A, port status:N/A
```

2.38.10 mel

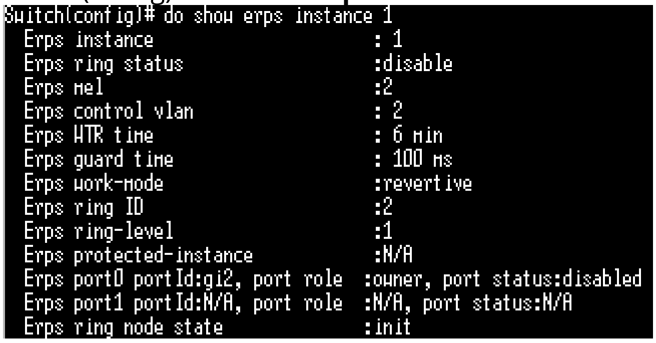
Syntax	**<0-7>**
Parameter	<0-7> Specify the mel value.
Default	Default is 0
Mode	erps configuration
Usage	Use the **mel <0-7>** command to configure the level erps instance . You can verify your setting by entering the **show erps instance** Privileged EXEC command.

Example The following example shows how to configure the mel value in erps instance.

Switch(config)# **erps instance 1**

Switch(config-erps-inst)# **mel 2**

Switch(config)# **do show erps instance 1**



```
Switch(config)# do show erps instance 1
  Erps instance                         : 1
  Erps ring status                      :disable
  Erps mel                              :2
  Erps control vlan                     : 2
  Erps WTR time                         : 6 min
  Erps guard time                       : 100 ms
  Erps work-mode                        :revertive
  Erps ring ID                          :2
  Erps ring-level                       :1
  Erps protected-instance               :N/A
  Erps port0 portId:gi2, port role     :owner, port status:disabled
  Erps port1 portId:N/A, port role     :N/A, port status:N/A
  Erps ring node state                 :init
```

2.38.11 ring enable

Syntax **ring (enable|disable)**

Parameter N/A

Default Default is disable

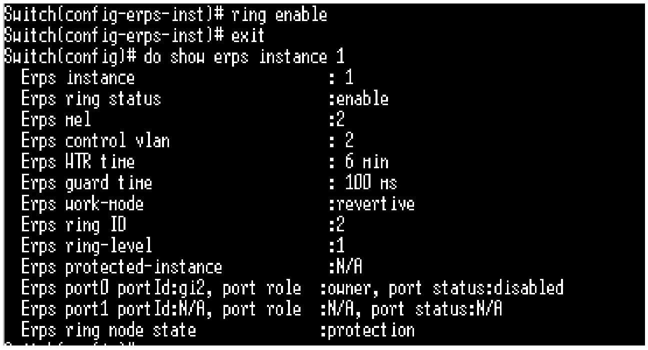
Mode erps configuration

Usage Use the **ring (enable|disable)** command to configure the ring status in erps instance .

You can verify your setting by entering the **show erps instance** Privileged EXEC command.

Example The following example shows how to configure the ring status in erps instance.

```
Switch(config)# erps instance 1
Switch(config-erps-inst)# ring enable
Switch(config)# do show erps instance 1
```



```
Switch(config-erps-inst)# ring enable
Switch(config-erps-inst)# exit
Switch(config)# do show erps instance 1
  Erps instance                         : 1
  Erps ring status                      :enable
  Erps mel                              :2
  Erps control vlan                     : 2
  Erps WTR time                         : 6 min
  Erps guard time                       : 100 ms
  Erps work-mode                        :revertive
  Erps ring ID                          :2
  Erps ring-level                       :1
  Erps protected-instance               :N/A
  Erps port0 portId:gi2, port role     :owner, port status:disabled
  Erps port1 portId:N/A, port role     :N/A, port status:N/A
  Erps ring node state                 :protection
```

2.38.12 show erps instance

Syntax **show erps instance (all | <0-15>)**

Parameter (all | <0-15>) Specify the erps instance number

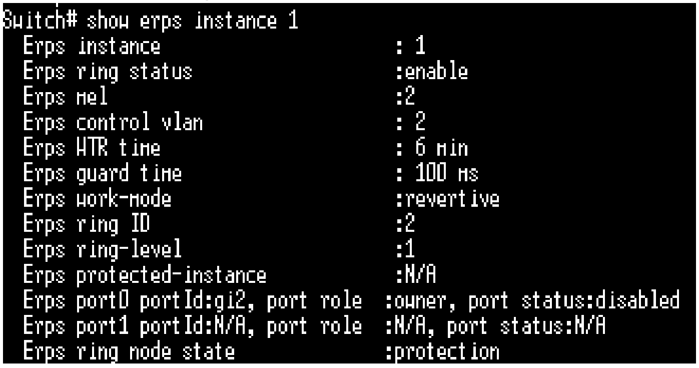
Default N/A

Mode erps configuration

Usage Use the **show erps instance** command to show the specific erps instance

Example The following example shows how to configure to show the erps instance.

Switch# show erps instance 1



```
Switch# show erps instance 1
  Erps instance                         : 1
  Erps ring status                      :enable
  Erps mel                              :2
  Erps control vlan                     : 2
  Erps WTR time                         : 6 min
  Erps guard time                       : 100 ms
  Erps work-mode                        :revertive
  Erps ring ID                          :2
  Erps ring-level                       :1
  Erps protected-instance               :N/A
  Erps port0 portId:gi2, port role     :owner, port status:disabled
  Erps port1 portId:N/A, port role     :N/A, port status:N/A
  Erps ring node state                 :protection
```

2.39 OSPF

2.39.1 ospf(global)

Syntax

ospf
no ospf

Parameter

process id	The process id only support 1

Default

Default is disable

Mode

Global Configuration

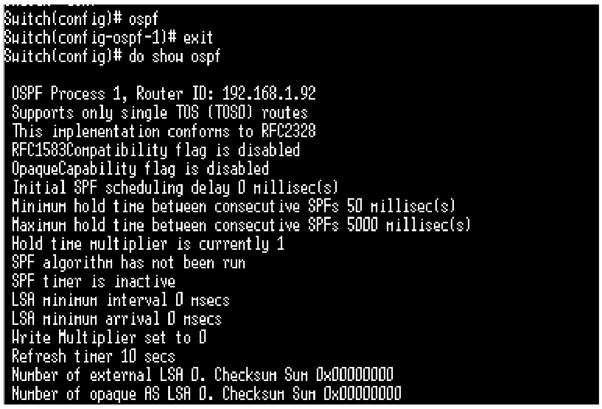
Usage

Use the **ospf** command to enable ospf running, You can verify your setting by entering the **show ospf** Privileged EXEC command.

Example

The following example shows how to configure to ospf process 1.

```
Switch(config)# ospf
Switch(config-ospf-1)#
Switch# show ospf
```



```
Switch(config)# ospf
Switch(config-ospf-1)# exit
Switch(config)# do show ospf

 OSPF Process 1, Router ID: 192.168.1.92
 Supports only single TOS (TOS0) routes
 This implementation conforms to RFC2328
 RFC1583Compatibility flag is disabled
 OpaqueCapability flag is disabled
 Initial SPF scheduling delay 0 millisec(s)
 Minimum hold time between consecutive SPFs 50 millisec(s)
 Maximum hold time between consecutive SPFs 5000 millisec(s)
 Hold time multiplier is currently 1
 SPF algorithm has not been run
 SPF timer is inactive
 LSA minimum interval 0 msecs
 LSA minimum arrival 0 msecs
 Write Multiplier set to 0
 Refresh timer 10 secs
 Number of external LSA 0. Checksum Sum 0x00000000
 Number of opaque AS LSA 0. Checksum Sum 0x00000000
```

2.39.2 router-id

Syntax

router-id A.B.C.D
no router-id

Parameter

A.B.C.D Specify the router id

Default

N/A

Mode

OSPF Configuration Mode

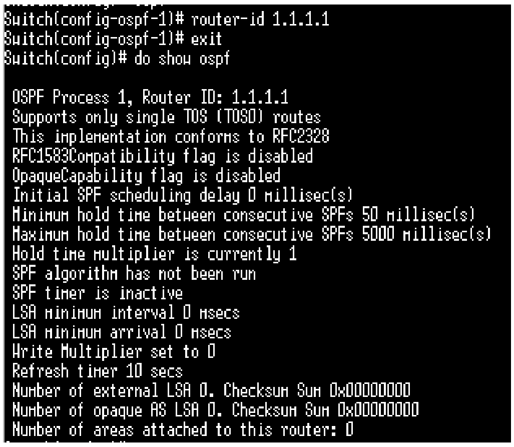
Usage

Use the **router-id 1.1.1.1** command to configure OSFP process 1 router ID is 1.1.1.1, You can verify your setting by entering the **show ospf** Privileged EXEC command.

Example

The following example shows how to configure ospf process 1 router-id.

```
Switch(config)# ospf
Switch(config-ospf-1)#router-id 1.1.1.1
Switch# show ospf
```



```
Switch(config-ospf-1)# router-id 1.1.1.1
Switch(config-ospf-1)# exit
Switch(config)# do show ospf

 OSPF Process 1, Router ID: 1.1.1.1
 Supports only single TOS (TOS0) routes
 This implementation conforms to RFC2328
 RFC1583Compatibility flag is disabled
 OpaqueCapability flag is disabled
 Initial SPF scheduling delay 0 millisec(s)
 Minimum hold time between consecutive SPFs 50 millisec(s)
 Maximum hold time between consecutive SPFs 5000 millisec(s)
 Hold time multiplier is currently 1
 SPF algorithm has not been run
 SPF timer is inactive
 LSA minimum interval 0 msecs
 LSA minimum arrival 0 msecs
 Write Multiplier set to 0
 Refresh timer 10 secs
 Number of external LSA 0. Checksum Sum 0x00000000
 Number of opaque AS LSA 0. Checksum Sum 0x00000000
 Number of areas attached to this router: 0
```

2.39.3 timers throttle spf

Syntax

timers throttle spf <0-600000> <0-600000> <0-600000>
no timers throttle spf

Parameter

Delay time <0-60000>	Initial SPF scheduling delay
Hold time <0-60000>	Minimum hold time between consecutive SPFs
Max hold time <0-60000>	Maximum hold time between consecutive SPFs

Default

delay time 0, hlod time 50, max hold time 5000

Mode

OSPF Process Configuration Mode

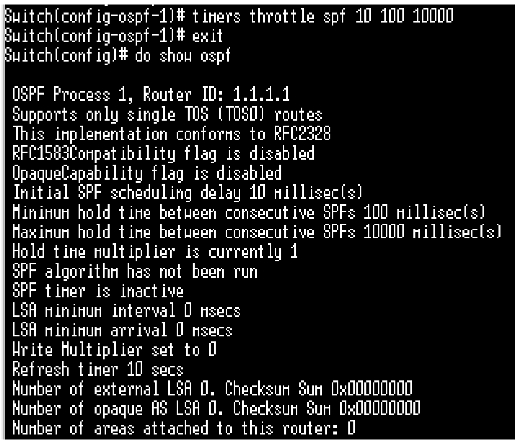
Usage

Use the **timers throttle spf 10 100 10000** command to configure OSFP process 1 timer throttle spf, You can verify your setting by entering the **show ospf** Privileged EXEC command.

Example

The following example shows how to configure to ospf timers throttle spf.

```
Switch(config)# ospf
Switch(config-ospf-1)# timers throttle spf 10 100
                        10000
Switch# show ospf
```



```
Switch(config-ospf-1)# timers throttle spf 10 100 10000
Switch(config-ospf-1)# exit
Switch(config)# do show ospf

 OSPF Process 1, Router ID: 1.1.1.1
 Supports only single TOS (TOS0) routes
 This implementation conforms to RFC2328
 RFC1583Compatibility flag is disabled
 OpaqueCapability flag is disabled
 Initial SPF scheduling delay 10 millisec(s)
 Minimum hold time between consecutive SPFs 100 millisec(s)
 Maximum hold time between consecutive SPFs 10000 millisec(s)
 Hold time multiplier is currently 1
 SPF algorithm has not been run
 SPF timer is inactive
 LSA minimum interval 0 msecs
 LSA minimum arrival 0 msecs
 Write Multiplier set to 0
 Refresh timer 10 secs
 Number of external LSA 0. Checksum Sum 0x00000000
 Number of opaque AS LSA 0. Checksum Sum 0x00000000
 Number of areas attached to this router: 0
```

2.39.4 refresh timer

Syntax

refresh timers <10-1800>
no refresh timers

Parameter

<0-60000> The refresh time interval

Default

Default is 10 secs

Mode

OSPF Process Configuration Mode

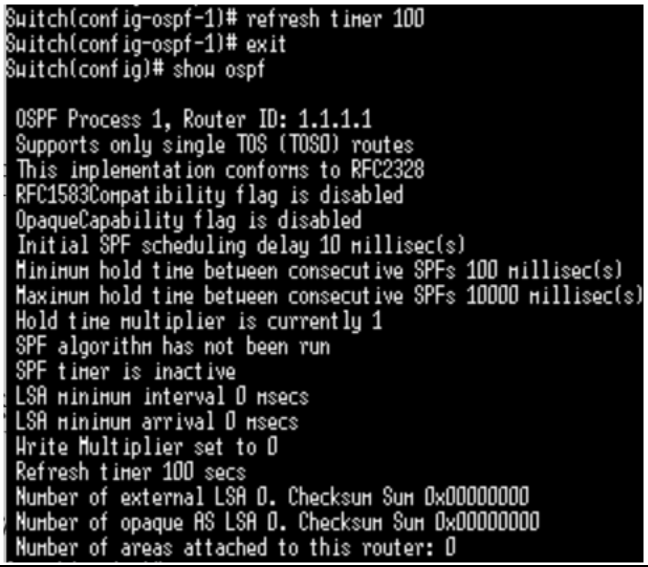
Usage

Use the **refresh timers** command to configure OSFP process 1 refresh time interval, You can verify your setting by entering the **show ospf** Privileged EXEC command.

Example

The following example shows how to configure to ospf refresh t timer.

```
Switch(config)# ospf
Switch(config-ospf-1)# refresh timer 100
Switch# show ospf
```



```
Switch(config-ospf-1)# refresh timer 100
Switch(config-ospf-1)# exit
Switch(config)# show ospf

 OSPF Process 1, Router ID: 1.1.1.1
 Supports only single TOS (TOS0) routes
 This implementation conforms to RFC2328
 RFC1583Compatibility flag is disabled
 OpaqueCapability flag is disabled
 Initial SPF scheduling delay 10 millisec(s)
 Minimum hold time between consecutive SPFs 100 millisec(s)
 Maximum hold time between consecutive SPFs 10000 millisec(s)
 Hold time multiplier is currently 1
 SPF algorithm has not been run
 SPF timer is inactive
 LSA minimum interval 0 msecs
 LSA minimum arrival 0 msecs
 Write Multiplier set to 0
 Refresh timer 100 secs
 Number of external LSA 0. Checksum Sum 0x00000000
 Number of opaque AS LSA 0. Checksum Sum 0x00000000
 Number of areas attached to this router: 0
```

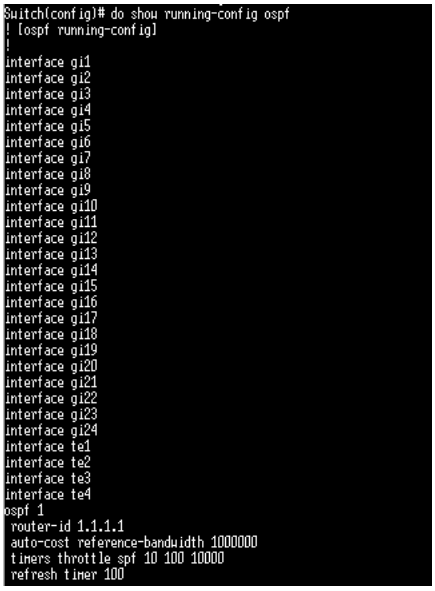
2.39.5 auto-cost reference-bandwidth

Syntax	**auto-cost reference-bandwidth <1-4294967>** **no auto-cost reference-bandwidth**	
Parameter	<1-429467>	The value ranges from 1 to 4,294,967 in megabits
Default	Default is 100000	
Mode	OSPF Process Configuration Mode	
Usage	Use the **auto-cost reference-bandwidth** command to configure OSFP process 1 referebce-bandwidth, You can verify your setting by entering the **show running-config ospf** Privileged EXEC command.	

Example

The following example shows how to configure to ospf auto-cost reference-bandwidth.

```
Switch(config)# ospf
Switch(config-ospf-1)# auto-cost reference-
                       bandwidth 1000000
Switch(config-ospf-1)# exit
Switch(config)# do show running-config ospf
```



```
Switch(config)# do show running-config ospf
! [ospf running-config]
!
interface gi1
interface gi2
interface gi3
interface gi4
interface gi5
interface gi6
interface gi7
interface gi8
interface gi9
interface gi10
interface gi11
interface gi12
interface gi13
interface gi14
interface gi15
interface gi16
interface gi17
interface gi18
interface gi19
interface gi20
interface gi21
interface gi22
interface gi23
interface gi24
interface te1
interface te2
interface te3
interface te4
ospf 1
 router-id 1.1.1.1
 auto-cost reference-bandwidth 1000000
 timers throttle spf 10 100 10000
 refresh timer 100
```

2.39.6 default-metric

Syntax

default-metric <0-16777214>
no default-metric

Parameter

<0-16777214> Set the default metric for importing routes.

Default

Default metric 20

Mode

OSPF Process Configuration Mode

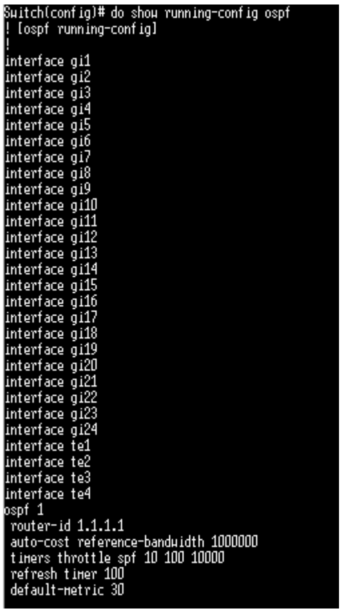
Usage

Use the **default-metric** command to configure OSFP process 1 metric, You can verify your setting by entering the **show running-config ospf** Privileged EXEC command.

Example

The following example shows how to configure to ospf default-metric.

Switch(config)# **ospf**
Switch(config-ospf-1)# **default-metric 30**
Switch(config-ospf-1)# **exit**
Switch(config)# **do show running-config ospf**



```
Switch(config)# do show running-config ospf
! [ospf running-config]
!
interface gi1
interface gi2
interface gi3
interface gi4
interface gi5
interface gi6
interface gi7
interface gi8
interface gi9
interface gi10
interface gi11
interface gi12
interface gi13
interface gi14
interface gi15
interface gi16
interface gi17
interface gi18
interface gi19
interface gi20
interface gi21
interface gi22
interface gi23
interface gi24
interface te1
interface te2
interface te3
interface te4
ospf 1
 router-id 1.1.1.1
 auto-cost reference-bandwidth 1000000
 timers throttle spf 10 100 10000
 refresh timer 100
 default-metric 30
```

2.39.7 passive-interface vlan-interface

Syntax

passive-interface vlan-interface <1-4094>
no passive-interface vlan-interface

Parameter

<1-4094>	Specify vlan-interface id

Default

N/A

Mode

OSPF Process Configuration Mode

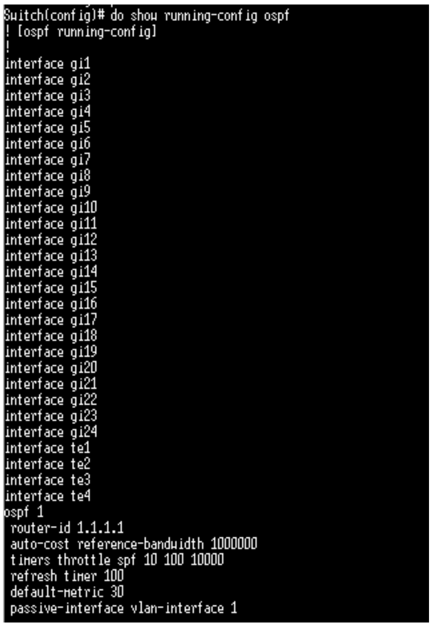
Usage

Use the **passive-interface vlan-interface** configure the mode of OSPF process 1 on the specified interface, This parameter is used together with passive-interface default. You can verify your setting by entering the **show running-config ospf** Privileged EXEC command.

Example

The following example shows how to configure OSPF process 1 vlan interface 1 does not send hello packets

```
Switch(config)# ospf
Switch(config-ospf-1)# passive-interface vlan-
                       interface 1
Switch(config)# do show running-config ospf
```



```
Switch(config)# do show running-config ospf
! [ospf running-config]
!
interface gi1
interface gi2
interface gi3
interface gi4
interface gi5
interface gi6
interface gi7
interface gi8
interface gi9
interface gi10
interface gi11
interface gi12
interface gi13
interface gi14
interface gi15
interface gi16
interface gi17
interface gi18
interface gi19
interface gi20
interface gi21
interface gi22
interface gi23
interface gi24
interface te1
interface te2
interface te3
interface te4
ospf 1
 router-id 1.1.1.1
 auto-cost reference-bandwidth 1000000
 timers throttle spf 10 100 10000
 refresh timer 100
 default-metric 30
 passive-interface vlan-interface 1
```

2.39.8 passive-interface default

Syntax

passive-interface default
no passive-interface default

Parameter

N/A

Default

Default is disabled passive-interface default

Mode

OSPF Process Configuration Mode

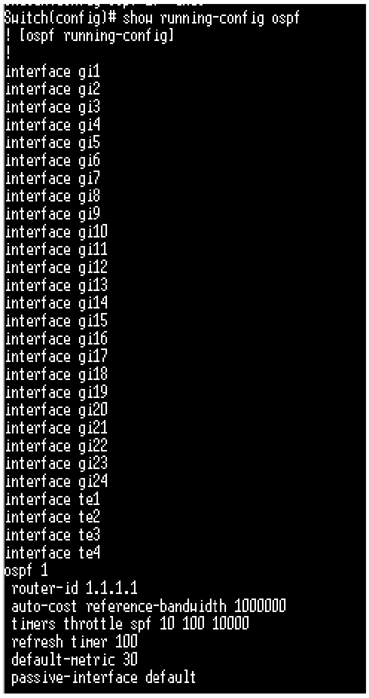
Usage

Use the **passive-interface default** configure the passive-interface default on OSPF process 1 .You can verify your setting by entering the **show running-config ospf** Privileged EXEC command.

Example

The following example shows how to configure passive-interface default on OSPF process 1.

```
Switch(config)# ospf
Switch(config-ospf-1)# passive-interface default
Switch(config)# do show running-config ospf
```



```
Switch(config)# show running-config ospf
! [ospf running-config]
!
interface gi1
interface gi2
interface gi3
interface gi4
interface gi5
interface gi6
interface gi7
interface gi8
interface gi9
interface gi10
interface gi11
interface gi12
interface gi13
interface gi14
interface gi15
interface gi16
interface gi17
interface gi18
interface gi19
interface gi20
interface gi21
interface gi22
interface gi23
interface gi24
interface te1
interface te2
interface te3
interface te4
ospf 1
 router-id 1.1.1.1
 auto-cost reference-bandwidth 1000000
 timers throttle spf 10 100 10000
 refresh timer 100
 default-metric 30
 passive-interface default
```

2.39.9 area

Syntax

area (A.B.C.D|<0-4294967295>)
no area (A.B.C.D|<0-4294967295>)

Parameter

A.B.C.D	Area ID, ip address format
<0-4294967295>	Area ID, The value is a decimal integer ranging from 0 to 4294967295. The system will process it as an IP address.

Default

N/A

Mode

OSPF Process Configuration Mode

Usage

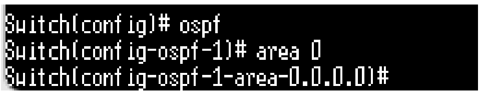
Use the **area** configure OSPF process 1 area and enter area mode. You can verify your setting by entering the **show running-config ospf** Privileged EXEC command.

Example

The following example shows how to configure OSPF area and ID on OSPF process 1.

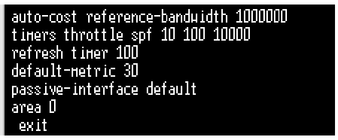
Switch(config)# **ospf**

```
Switch(config-ospf-1)#area 0
```



```
Switch(config)# ospf
Switch(config-ospf-1)# area 0
Switch(config-ospf-1-area-0.0.0.0)#
```

```
Switch(config)# do show running-config ospf
```



```
auto-cost reference-bandwidth 1000000
timers throttle spf 10 100 10000
refresh timer 100
default-metric 30
passive-interface default
area 0
 exit
```

2.39.10 network

Syntax

network A.B.C.D/Mask
no network A.B.C.D/Mask

Parameter

A.B.C.D/M	IP Address and Mask

Default

By default, the interface does not belong to any area and the OSPF function is disabled.

Mode

OSPF area Configuration Mode

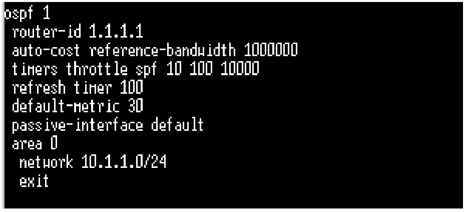
Usage

Use the **"network A.B.C.D/M"** command to enable OSPF in the OSPF area of each network interface of the device**.** You can verify your setting by entering the **show running-config ospf** Privileged EXEC command.

Example

The following example shows how to specify the IP address of the interface 10.1.1.0/24. OSPF is running in area 0.

```
Switch(config)# ospf
Switch(config-ospf-1)#area 0
Switch(config-ospf-1-area-0.0.0.0)# network
                                      10.1.1.0/24
Switch(config)# do show running-config ospf
```



```
ospf 1
 router-id 1.1.1.1
 auto-cost reference-bandwidth 1000000
 timers throttle spf 10 100 10000
 refresh timer 100
 default-metric 30
 passive-interface default
 area 0
  network 10.1.1.0/24
  exit
```

2.39.11 default-cost

Syntax

default-cost <0-16777215>
no default-cost

Parameter

<0-16777215>	Default cost

Default

Default is 1

Mode

OSPF area Configuration Mode

Usage

Run the "default-cost <0-16777215>" command to configure the default cost of importing the default route to the stub/nssa area. This command only applies to the ABR router that is connected to the stub area or NSSA area. You can verify your setting by entering the show running-config ospf Privileged EXEC command.

Example

The following example shows how to configure default-cost on ospf area 1

```
Switch(config)# ospf
Switch(config-ospf-1)#area 1
Switch(config-ospf-1-area-0.0.0.1)#default-cost 10
```

2.39.12 authentication

Syntax

authentication [message-digest]
no authentication

Parameter

Message-digest	MD5 authentication mode. This parameter is optional. If this parameter is not selected, this parameter is simple authentication mode.

Default

Default is enabled

Mode

OSPF area Configuration Mode

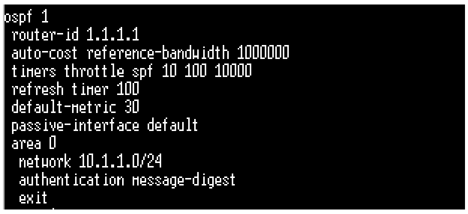
Usage

Run the authentication command to configure the authentication mode for OSPF packets in an OSPF area. You can verify your setting by entering the show running-config ospf Privileged EXEC command.

Example

The following example shows how to configure authentication message-digest on area 0.

```
Switch(config)# ospf
Switch(config-ospf-1)#area 0
Switch(config-ospf-1-area-0.0.0.0)#authentication
                                    message-digest
```



```
ospf 1
 router-id 1.1.1.1
 auto-cost reference-bandwidth 1000000
 timers throttle spf 10 100 10000
 refresh timer 100
 default-metric 30
 passive-interface default
 area 0
  network 10.1.1.0/24
  authentication message-digest
  exit
```

2.39.13 ospf authentication

Syntax

ospf authentication [(null | message-digest)]
no ospf authentication

Parameter

Message-digest	MD5 authentication mode. This parameter is optional. If this parameter is not selected, this parameter is simple authentication mode.(The password is in plaintext.)
null	no ospf authentication

Default

Default is disabled

Mode

Interface Configuration

Usage

Run the *ospf authentication* command to configure the interface to authenticate OSPF packets and the authentication mode.

Using the ospf authentication null and no ospf authentication commands, you can cancel the authentication mode configured on the related interface.

Example

The following example shows how to configure ospf authentication on vlan 1.

```
Switch(config)# interface vlan 1
Switch(config-if-vlan1)# ospf authentication simple
```

2.39.14 ospf authentication-key

Syntax

ospf authentication-key WORD<1-64>
no ospf authentication-key

Parameter

<1-64>	Plaintext password

Default

Default is no ospf authentication-key

Mode

Interface Configuration

Usage

Run the ospf authentication-key command to configure the plaintext password for the interface to authenticate OSPF packets.

Example

The following example shows how to configure ospf authentication -key on vlan 1.

```
Switch(config)# interface vlan 1
Switch(config-if-vlan1)# ospf authenticatio-key
                         123456
```

2.39.15 ospf cost

Syntax

ospf cost <1-65535>
no ospf cost

Parameter

<1-65535>	OSPF Path Cost

Default

Default is 10

Mode

Interface Configuration

Usage

Run the ospf cost command to set the cost for running OSPF on an interface

Example

The following example shows how to configure ospf cost on vlan 1.

```
Switch(config)# interface vlan 1
Switch(config-if-vlan1)# ospf cost 20
```

2.39.16 ospf priority

Syntax

ospf priority <0-255>
no ospf priority

Parameter

<0-255>	The interface DR priority value

Default

Default is 1

Mode

Interface Configuration

Usage

The **ospf priority** command is used to set the cost required for running OSPF on an interface.

The DR Priority of an interface determines the qualification of the interface in the DR/BDR election. A larger value indicates a higher priority. Those with higher priority are considered first in the event of a conflict over voting rights. If a device has a priority of 0, it is not elected as a DR Or BDR.

Example

The following example shows how to configure ospf priority on vlan 1.

```
Switch(config)# interface vlan 1
Switch(config-if-vlan1)# ospf priority 10
```

2.39.17 ospf hello-interval

Syntax

ospf hello-interval <1-65535>
no ospf hello-interval

Parameter

<1-65535>	Interval for the interface to send Hello packets. The value ranges from 1 to 65535, in seconds

Default

Default is 10 seconds

Mode

Interface Configuration

Usage

Run the **ospf hello-interval** command to set the interval for sending Hello packets on an interface.

Example

The following example shows how to configure ospf hello-interval on vlan 1.

```
Switch(config)# interface vlan 1
Switch(config-if-vlan1)# ospf hello-interval 30
```

2.39.18 ospf dead-interval

Syntax

ospf dead-interval <1-65535>
no ospf dead-interval

Parameter

<1-65535>	Interval of interface neighbor failure The value ranges from 1 to 65535, in seconds

Default

By default, the invalid interval of OSPF neighbors on P2P and Broadcast interfaces is 40 seconds. The invalid time of the OSPF neighbor on the P2MP or NBMA interface is 120 seconds.

Mode

Interface Configuration

Usage

Run the ospf dead-interval command to set the dead interval of the OSPF neighbors on the interface

Example

The following example shows how to configure ospf dead-interval on vlan 1.

```
Switch(config)# interface vlan 1
Switch(config-if-vlan1)# ospf dead-interval 30
```

2.39.19 ospf retransmit-interval

Syntax	**ospf retransmit-interval <1-65535>** **no ospf retransmit-interval**
Parameter	<1-65535> — Interval for retransmitting LSA on an interface. The value ranges from 1 to 65535, in seconds
Default	Default is 5 seconds
Mode	Interface Configuration
Usage	Run the **ospf retransmit-interval** command to set the invalid time of the OSPF neighbor on the interface.
Example	The following example shows how to configure ospf retransmit-interval on vlan 1.

```
Switch(config)# interface vlan 1
Switch(config-if-vlan1)# ospf retransmit-interval
                         10
```

2.39.20 ospf transmit-delay

Syntax	**ospf transmit-delay <1-65535>** **no ospf transmit-delay**
Parameter	<1-65535> — Delay for transmitting LSA on an interface The value ranges from 1 to 65535, in seconds
Default	Default is 1 seconds
Mode	Interface Configuration
Usage	Run the **ospf transmit-delay** command to set the time for the OSPF neighbor failure on the interface
Example	The following example shows how to configure ospf transmit-delay on vlan 1.

```
Switch(config)# interface vlan 1
Switch(config-if-vlan1)# ospf transmit-delay 2
```

2.39.21 ospf network

Syntax

ospf network (broadcast|non-broadcast|point-to-multipoint |point-to-point)
no ospf network

Parameter

broadcast	The OSPF network type of the interface is broadcast
non-broadcast	The OSPF network type of the interface is NBMA
Point-to-multipoint	The OSPF network type of the interface is PTMP
point-to-point	The OSPF network type of the interface is PTP

Default

Default is broadcast

Mode

Interface Configuration

Usage

Run the ospf transmit-delay command to configure the OSPF network type of the interface

Example

The following example shows how to configure ospf network on vlan 1.

```
Switch(config)# interface vlan 1
Switch(config-if-vlan1)# ospf network point-to-point
```

2.39.22 ospf mtu-ignore

Syntax

ospf mtu-ignore
no ospf mtu-ignore

Parameter

N/A

Default

Default to check the MTU

Mode

Interface Configuration

Usage

Run the **ospf mtu-ignore** command to configure the interface not to check the MTU size during DD switching.

Example

The following example shows how to configure ospf mtu-ignore on vlan 1.

```
Switch(config)# interface vlan 1
Switch(config-if-vlan1)# ospf mtu-ignore
```

2.40 RIP

2.40.1 distance

Syntax

distance num
no distance num

Parameter

<1-255>	A decimal value from 1 through 255 that designates the administrative distance for all RIP routes.

Default

N/A

Mode

RIP Router configuration mode

Usage

Routes with lower administrative distance are more likely to be used when administrative distance is used for route comparison.

Example

The following example sets the administrative distance for RIP routes to 150.

```
Switch(config)# rip
Switch(config-rip)# distance 150
Switch(config-rip)# exit
```

2.40.2 distribute-list in

Syntax

ip rip distribute-list access access-list-name in
no ip rip distribute-list in

Parameter

access-list-name	Standard IP access list name, up to 32 characters. The list defines which routes in incoming RIP update messages are to be accepted and which are to be suppressed.

Default

No filtering

Mode

RIP Configuration mode

Usage

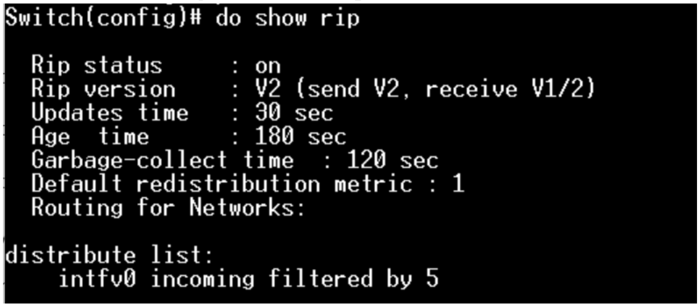
The **ip rip distribute-list in** rip configuration mode command enables filtering of routes in incoming RIP update messages. The **no** format of the command disables the filtering.

Each network from a received RIP update message is evaluated by the access list and it is accepted only if it is permitted by the list. See the ip access-list (IP standard) and ip prefix-list commands for details.

Example

The following example shows how to define input filtering:

```
Switch(config)#rip
switch(config-rip)# distribute-list 5 in interface
                                 vlan 1
switch(config-route-map)# exit
```



```
Switch(config)# do show rip

  Rip status      : on
  Rip version     : V2 (send V2, receive V1/2)
  Updates time    : 30 sec
  Age  time       : 180 sec
  Garbage-collect time  : 120 sec
  Default redistribution metric : 1
  Routing for Networks:

distribute list:
    intfv0 incoming filtered by 5
```

2.40.3 ip rip distribute-list out

Syntax

rip distribute-list access access-list-name out

no rip distribute-list out

Parameter

access-list-name	Standard IP access list name, up to 32 characters. The list defines which routes in outgoing RIP update messages are to be sent and which are to be suppressed.

Default

No filtering

Mode

RIP Configuration mode

Usage

The **rip distribute-list out** IP configuration mode command enables filtering of routes in outgoing RIP update messages. The **no** format of the command disables the filtering.

Each network from the IP Forwarding table is evaluated by the list and it is included in the RIP update message only if it is permitted by the list. See the ip access-list (IP standard) and ip prefix-list commands.

Example

The following example shows how to define outgoing filtering:

```
switch(config)# interface ip 1.1.1.1
switch(config-rip)# distribute-list 5 out int vlan
                                  2
switch(config-route-map)# exit
```

2.40.4 network

Syntax

network ip-address
no network ip-address

Parameter

ip-address A.B.C.D/M — An IP address of a switch IP interface.

Default

N/A

Mode

RIP Configuration mode

Usage

RIP can be defined only on manually-configured IP interfaces, meaning that RIP cannot be defined on an IP address defined by DHCP or on a default IP address.

Use the no network CLI command to remove RIP on an IP Interface and remove its interface configuration.

Example

The following example shows how to enable RIP on IP interface 1.1.1.1 with the default interface configuration:

```
switch(config)# router rip
switch(config-rip)# network 192.168.1.88/24
switch(config-rip)# exit
```

2.40.5 route

Syntax

route <A.B.C.D/M>
no router rip <A.B.C.D/M>

Parameter

N/A

Default

Default is disabled

Mode

RIP Configuration mode

Usage

If a value of the RIP global state is disabled (default value), RIP is not operational and cannot be configured. When this state is set, the RIP configuration is removed. The state may be set by the no router rip CLI command from any RIP global state.

Example

The following example shows how to enable RIP globally:

```
switch(config)# rip
switch(config-rip)# route 10.0.0.0/8
```

2.41 PoE

2.41.1 PoE Port Setting

Syntax

poe
no poe

Parameter

N/A

Default

All ports are enabled for poe power supply by default.
(Poe-enabled device)

Mode

Interface Configuration mode

Usage

Use the poe command in interface mode to enable port poe power supply.
Use the no poe command in interface mode to disable port poe power supply.
You can check the port poe working status by using the show poe Privileged EXEC command.

Example

The following example shows how to config poe.

```
Switch(config)# interface GigabitEthernet 1
Switch(config-if)# poe
Switch# show poe
```

2.41.2 PoE Port Schedule Setting

Syntax

poe schedule week days **hour** hours
no poe schedule week days **hour** hours

Parameter

days	Port poe power supply days
hours	Port poe power supply hours

Default

All ports open POE function all day by default.
(PoE-enabled device)

Mode

Interface Configuration mode

Usage

Use the **poe schedule** command in interface mode to set port poe power supply time.

Use the **no poe schedule** command in interface mode to clear port poe power supply time..

You can check the port poe work time setting view through the web.

Example

The following example shows how to config poe schedule.

```
Switch(config)# interface GigabitEthernet 1
Switch(config-if)# poe schedule week mon hour 1
```

Note: The configured time has a deviation of about 0~10 minutes.