

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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Units of measurement in this publication conform to SI standards and practices.

Jan 01, 2022

Version number: 1.0

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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

1.1.1. Logging in using the RS-232 Console

1.1.2. Logging in using Telnet

1.2 Command Modes

1.2.1. Configuration

1.2.2. Understanding All Command Modes

1.3 Help Messages

1.4 Special Usage and Limitations

1.5 Abbreviated Commands

1.6 No and Default Forms of Commands

1.7 CLI Error Messages

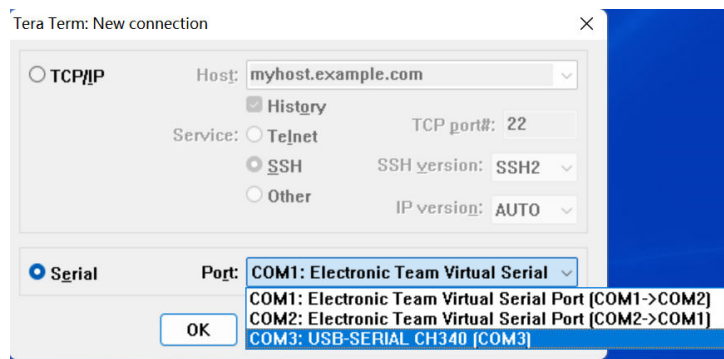
1.8 Command Histor

1.1 Accessing the Switch

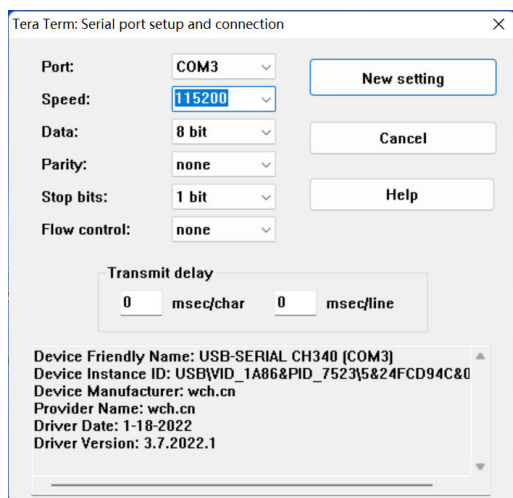
Users can connect to the switch using one of two methods: by console or by Telnet

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



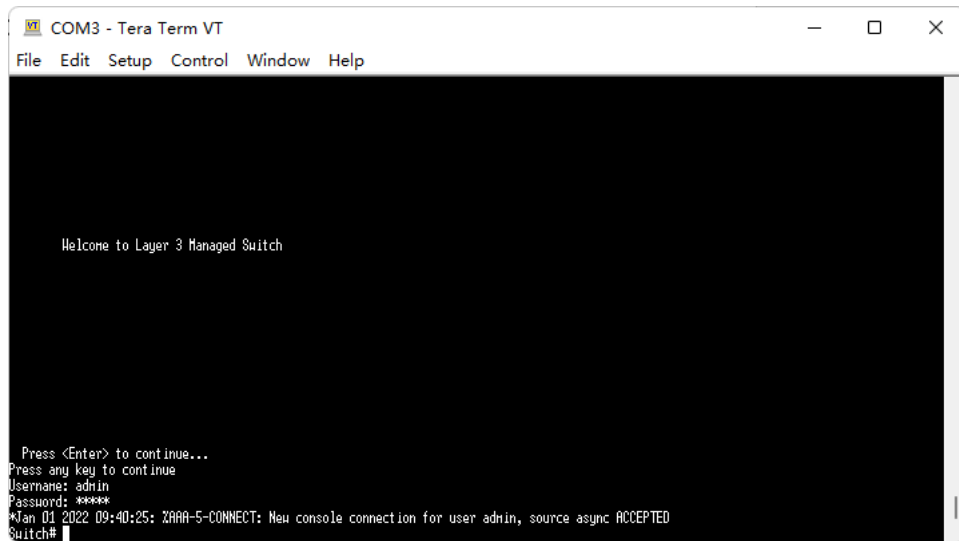
- 5, Click **Setup>Serial Port** to establish a new connection



- 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)



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).

- 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 switch 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.

```

COM3 - Tera Term VT
File Edit Setup Control Window Help

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
rename      Rename 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
udd         Configure global UDD 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 `conf` at the command prompt to enter configuration mode.

```
Switch# conf
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 be 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
snmp        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 Ethernet 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 <i>LISTNAME</i>) <i>METHODLIST</i> [<i>METHODLIST</i>] [<i>METHODLIST</i>] [<i>METHODLIST</i>] no aaa authentication (login enable) <i>LISTNAME</i>	
Parameter	login	Add/Edit login authentication list
	enable	Add/Edit enable authentication list
	default	Edit default authentication list
	<i>LISTNAME</i>	Specify the list name for authentication type
	<i>METHODLIST</i>	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. <pre>Switch(config)# aaa authentication login test1 tacacs+ radius local</pre>
----------------	---

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 <i>LISTNAME</i> no login authentication	
Parameter	<i>LISTNAME</i>	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 localSwitch(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
<i>LISTNAME</i>	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 <pre>Switch(config)# tacacs default-config timeout 20 Switch(config)# tacacs default-config key tackey</pre> This example shows how to show default tacacs+ configurations. <pre>Switch# show tacacs default-config Timeout Key -----+----- 10 tackey</pre> This example shows how to create a new tacacs+ server with above default config and show results. <pre>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</pre>

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. <pre>Switch# show radius default-config Retries Timeout Key -----+-----+----- 5 20 radiuskey</pre>

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. <pre>Switch# show radius Prio IP Address Auth-Port Retries Timeout Type Key -----+-----+-----+-----+-----+-----+----- 100 192.168.1.111 12345 5 10 R11 radiuskey</pre>

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 <pre>Switch334455(config)# mac acl test Switch334455(mac-al)# show acl Switch(config-mac-acl)# show acl MAC access list test</pre>

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 <pre>Switch3(config)# mac acl test Switch(mac-al)# sequence 999 permit</pre>	

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:00:00:00/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:00:00:00/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-acl)# show acl
```

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

IP access list iptest
```

2.2.5 permit(IP)

Syntax	<pre>[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]</pre> <pre>[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]</pre> <pre>[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 drip PORT_RANGE any) [match-all TCP_FLAG] [(dscp precedence) VALUE]</pre> <pre>[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]</pre> <pre>no sequence <1-2147483647></pre>
---------------	--

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 "+" and "\". If a flag should be unset it is prefixed by "-" and "\". 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 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	<pre>[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]</pre> <pre>[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]</pre> <pre>[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]</pre> <pre>[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]</pre> <pre>no sequence <1-2147483647></pre>	
---------------	--	--

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 '+' and '\'. If a flag should be unset it is prefixed by '-' and '\'. 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 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-acl)# deny ip 192.168.1.80/255.255.255.255 any
```

```
Switch(ip-acl)# 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-acl)# 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.
I4-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.
I4-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 '+' and '\'. If a flag should be unset it is prefixed by '-' and '\'. 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 '+' and '\'. If a flag should be unset it is prefixed by '-' and '\'. 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
ipv6 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. <code>Switch(config)# show ip acl</code> 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 <code>Switch(config-if)# do show acl utilization</code>

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 <pre>Switch(config)# hostname fiberroad fiberroad(config)#</pre> 

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: <pre>fa1 FastEthernet3 Gigabit4</pre> If port range is specified, the list format is also available. For Example: <pre>fa1,3,5 fa2,gi1-3</pre>
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. <pre>Switch(config)# ip default-gateway 192.168.1.100</pre> This example shows how to show current ipv4 default gateway of the switch. <pre>Switch# show ip IP Address: 192.168.1.1 Subnet Netmask: 255.255.255.0 Default Gateway: 192.168.1.100</pre>

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. <pre>Switch(config)# ip dns 111.111.111.111 222.222.222.222</pre> This example shows current DNS server of the switch. <pre>Switch# show ip dns DNS lookup is enabled DNS Server 1 : 111.111.111.111 DNS Server 2 : 222.222.222.222</pre>

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. <pre>Switch(config)# ipv6 address fe80::20e:2eff:fe1:4b3c prefix 128</pre> This example shows how to show current ipv6 address of the switch. <pre>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:fe1:4b3c/128 IPv6 static Gateway Address : :: IPv6 in use Address : fe80::dcad:beff:feef:102/64 IPv6 in use Gateway Address : ::</pre>

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. <pre>Switch(config)# ipv6 default-gateway fe80::dcad:beff:feef:103</pre>

```
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. <pre>Switch(config)# ipv6 dhcp</pre> This example shows how to show current dhcpv6 client state of the switch. <pre>Switch# show ipv6 dhcp DHCPv6 Status : enabled</pre>

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. <pre>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)</pre> This example shows how to enable https service and show current https service status. <pre>Switch(config)# ip https Switch(config)# exit Switch# show ip https HTTPS daemon : enabled Session Timeout : 10 (minutes)</pre>

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 <pre>Switch(config)# ip http session-timeout 15 Switch(config)# ip https session-timeout 20</pre> This example shows how to enable https service and show current https service status. <pre>Switch# show ip http HTTPS daemon : enabled Session Timeout : 15 (minutes) Switch# show ip https HTTPS daemon : disabled Session Timeout : 20 (minutes)</pre>	

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 <table><tr><th>File Name</th><th>File Size</th><th>Modified</th></tr><tr><td>startup-config</td><td>1246</td><td>2022-01-01 00:02:02</td></tr><tr><td>ssl_cert</td><td>1245</td><td>2022-01-01 00:00:29</td></tr><tr><td>image</td><td>8557717</td><td>2022-11-01 13:37:51</td></tr></table> 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 <table><tr><th>File Name</th><th>File Size</th><th>Modified</th></tr><tr><td>startup-config</td><td>1246</td><td>2022-01-01 00:02:02</td></tr><tr><td>rsa2</td><td>1679</td><td>2022-01-01 00:20:28</td></tr><tr><td>dsa2</td><td>672</td><td>2022-01-01 00:20:36</td></tr><tr><td>ssl_cert</td><td>1245</td><td>2022-01-01 00:00:29</td></tr><tr><td>image</td><td>8557717</td><td>2022-11-01 13:37:51</td></tr></table>	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	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
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																													
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 secret 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. <pre>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</pre>

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. <pre>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</pre> This example shows how show line information. <pre>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)</pre>

```
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. <pre>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</pre>

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 <pre> 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 </pre>

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 <pre> IP Address: 192.168.1.200 Subnet Netmask: 255.255.255.0 Default Gateway: 192.168.1.254 </pre>

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. <pre>Switch# show ip http HTTP daemon : enabled Session Timeout : 10 (minutes) Switch# show ip https HTTPS daemon : enabled Session Timeout : 10 (minutes)</pre>

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. <pre>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 : ::</pre>

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. <pre>Switch# show ipv6 dhcp DHCPv6 Status : enabled</pre>

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:  0    83076    172100
Swap:      0         0         0
```

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 | HJEyHzJnHjk3VTU3VTvNnZQz00k0VtB1N8E4H0FvZzH=
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. <pre>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#</pre>

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

2.3.49 username

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

no username WORD<0-32>

Parameter	username	Specify user name to add/delete/edit. WORD<0-32>
	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 UNENCRYPT-PASSWORD	Specify password string and make it not encrypted.
	secret UNENCRYPT-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	HjEjtz7hMjk3VTU3VTvNhz0z00k0VTB1NGE4MDFhYzM=
15	secret	test	NzZhMjE3M2JlNjM5MzI1NGU3MzZyYTRkNHRhMTIzNGE=

2.4 Authentication Manager

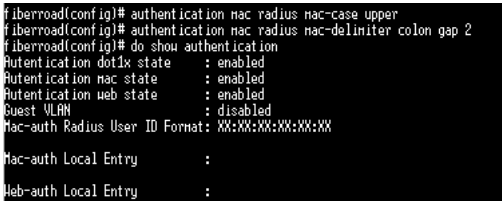
2.4.1 authentication

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. <pre>fiberroad(config)# authentication dot1x fiberroad(config)# authentication mac fiberroad(config)# authentication web fiberroad(config)# exit fiberroad# show authentication Authentication dot1x state : enabled Authentication mac state : enabled Authentication 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--</pre>

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. <pre>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</pre>  <pre> fiberroad# configure fiberroad(config)# interface GigabitEthernet Gigabit ethernet interface to configure LAG IEEE 802.3 Link Aggregation 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-- </pre>

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 <pre>Switch(config)# authentication mac radius mac- case upper Switch(config)# authentication mac radius mac- delimiter colon gap 2 Switch# show authentication</pre>  <pre>fiberroad(config)# authentication mac radius mac-case upper fiberroad(config)# authentication mac radius mac-delimiter colon gap 2 fiberroad(config)# do show authentication Authentication dot1x state : enabled Authentication mac state : enabled Authentication 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 :</pre>	

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

```

K33:00:01 control auth vlan 3 reauth-period 500 inactive-timeout 300
fiberroad(config)# do show authentication
Authentication dot1x state      : enabled
Authentication mac state       : enabled
Authentication web state       : enabled
Guest VLAN                     : disabled
Mac-auth Radius User ID Format: XX:XX:XX:XX:XX:XX

Mac-auth Local Entry           :
+-----+-----+-----+-----+-----+
MAC Address      Control      VLAN      Reauth      Inactive
+-----+-----+-----+-----+-----+
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. <pre> Switch(config) # vlan 3 Switch(config-vlan) # exit Switch(config) # authentication guest-vlan 3 Switch# show authentication </pre> <pre> fiberroad(config)# vlan 3 fiberroad(config-vlan)# exit fiberroad(config)# authentication guest-vlan 3 fiberroad(config)# do show authentication Authentication dot1x state : enabled Authentication mac state : enabled Authentication web state : enabled Guest VLAN : enabled (3) Mac-auth Radius User ID Format: XX:XX:XX:XX:XX:XX </pre>

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. <pre> 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-- </pre>

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. <pre> 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 </pre>

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. <pre>Switch(config)# interface GigabitEthernet 1 Switch(config-if)# authentication method local radius Switch#show authentication interface GigabitEthernet 1</pre>  <pre>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</pre>	

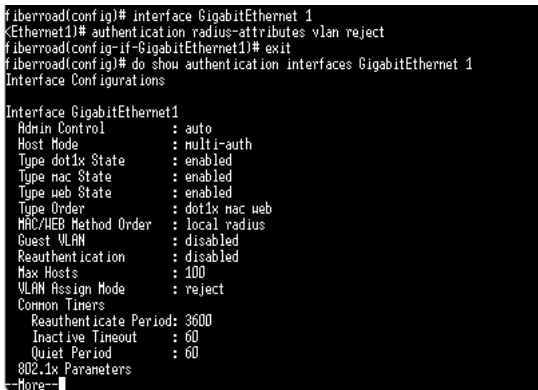
2.4.10 authentication order

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. <pre>Switch(config) # interface fa1 Switch(config-if) # authentication order dot1x mac web Switch# show authentication interface fa1</pre>  <pre>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</pre>	

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. <pre>Switch(config)# interface GigabitEthernet 1 Switch(config-if)# authentication port-control auto Switch#show authentication interface GigabitEthernet1</pre>  <pre> 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-- </pre>	

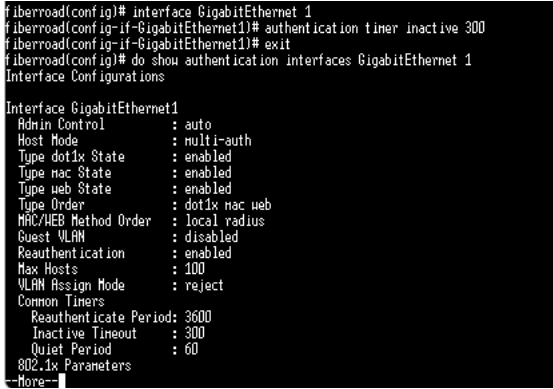
2.4.12 authentication radius-attribution vlan

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. <pre> Switch(config) # interface GigabitEthernet 1 Switch(config-if) # authentication radius-attributes vlan reject Switch# show authentication interface GigabitEthernet 1 </pre>  <pre> fiberroad(config)# interface GigabitEthernet 1 fiberroad(config-if)# 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 web 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 </pre>	

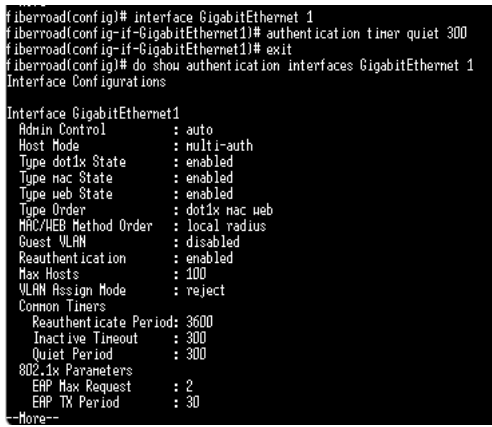
2.4.13 authentication reauth

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. <pre>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--</pre>

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. <pre>Switch(config) # interface GigabitEthernet 1 Switch(config-if) # authentication timer inactive 300 Switch#show authentication interface GigabitEthernet 1</pre>  <pre> 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 none </pre>

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. <pre>Switch(config) # interface GigabitEthernet 1 Switch(config-if) # authentication timer quiet 300 Switch#show authentication interface GigabitEthernet 1</pre>  <pre>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 web 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--</pre>

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
ERP Max Request     : 2
ERP 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	Encrypted password.
	CRYPT-PASSWORD	
	PASSWORD	Un-encrypted password.
	vlan <1-4094>	Assigned VLAN of this local account
	reauth-period <300-4294967294>	Reauthentication period of this local account
Default	inactive-timeout <60-65535>	Inactive timeout of this local account
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.

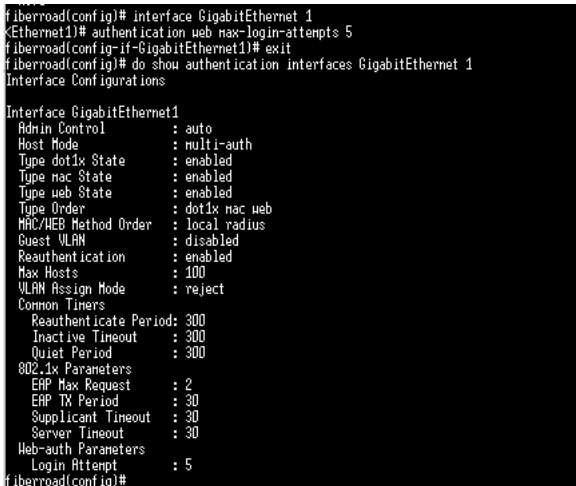
```
Switch(config)# authentication web local username
acct1 password acct1 vlan 3 reauth-period 301
inactive-timeout 61
Switch# show authentication
```

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

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

Web-auth Local Entry :
User Name VLAN Reauth Period Inactive 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. <pre>Switch(config) # interface GigabitEthernet 1 Switch(config-if) # authentication web max-login-attempts 5 Switch# show authentication interface GigabitEthernet 1</pre>  <pre>fiberroad(config)# interface GigabitEthernet 1 GigabitEthernet1# 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 f fiberroad(config)#</pre>	

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	Clear sessions on specific interface
	IF_PORTS	
	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. <pre>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#</pre>	

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. <pre>Switch(config)# dot1x Switch# show authentication fiberroad(config)# dot1x fiberroad(config)# do show authentication Authentication dot1x state : enabled Authentication mac state : enabled Authentication web state : enabled Guest VLAN : enabled (3) Mac-auth Radius User ID Format: XX:XX:XX:XX:XX:XX --More--</pre>

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. <pre>fiberroad(config)# vlan 3 fiberroad(config-vlan)# exit fiberroad(config)# dot1x guest-vlan 3 fiberroad(config)# exit fiberroad# show authentication Authentication dot1x state : enabled Authentication mac state : enabled Authentication web state : enabled Guest VLAN : enabled (3) Mac-auth Radius User ID Format: XX:XX:XX:XX:XX:XX</pre>

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), <u>the authentication process is restarted.</u>
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.

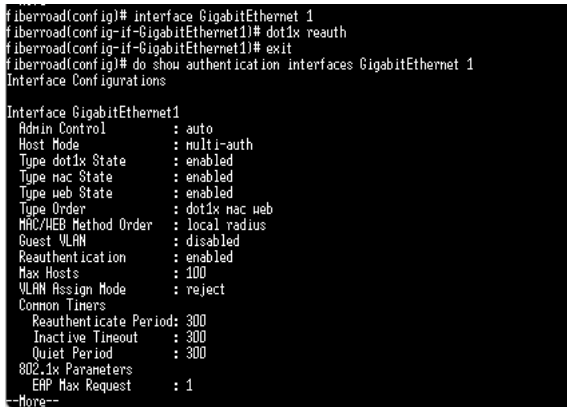
```
Switch(config)# interface GigabitEthernet 1
Switch(config-if)# dot1x max-req 1
Switch# show authentication interface
GigabitEthernet 1
```

```
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. <pre>Switch(config)# interface fa1 Switch(config-if)# dot1x port-control auto Switch# show authentication interface fa1</pre>  <pre>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</pre>	

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. <pre>Switch(config) # interface GigabitEthernet 1 Switch(config-if) # dot1x reauth Switch# show authentication interface GigabitEthernet 1</pre> 

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 timeout 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

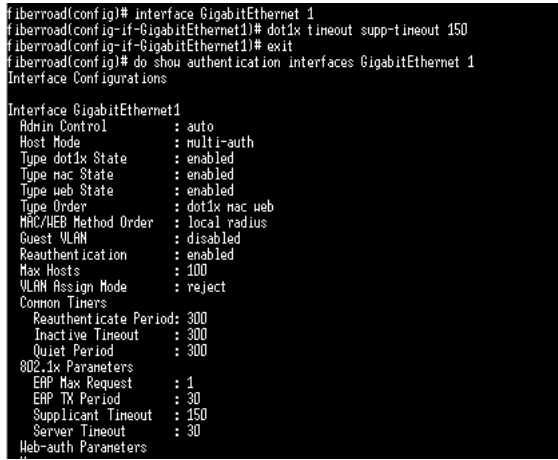
Syntax	dot1x timeout quiet-period <0-65535> no dot1x timeout quiet-period
Parameter	<0-65535> Interval in seconds to wait following a failed authentication exchange
Default	Default quiet period is 60 seconds.
Mode	Interface Configuration
Usage	Use “dot1x timeout quiet-period” command to configure the 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 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. <pre>Switch(config) # interface GigabitEthernet 1 Switch(config-if) # dot1x timeout supp-timeout 150 Switch# show authentication interface GigabitEthernet 1</pre>  <pre> 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 </pre>

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. <pre>Switch(config)# interface GigabitEthernet Switch(config-if)# dot1x timeout supp-timeout 120 Switch# show authentication interface GigabitEthernet 1</pre> <pre>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</pre>

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 response 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. <pre>Switch(config)# interface GigabitEthernet 1 Switch(config-if)# dot1x timeout tx-period 10 Switch# show authentication interface GigabitEthernet 1</pre> <pre> 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 </pre>

2.4.30 show authentication

Syntax	show authentication show authentication interfaces IF_PORTS	
Parameter	interfaces	Specify port list to show port configurations. IF_PORTS
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
Authentication dot1x state : enabled
Authentication mac state : enabled
Authentication web state : enabled
Guest VLAN : enabled (3)
Mac-auth Radius User ID Format: XX:XX:XX:XX:XX:XX

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

Web-auth Local Entry :
User Name VLAN Reauth Period Inactive 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 Privileged 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 Privilege 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. <pre> 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) </pre>	

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. <pre> 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 Vlan : 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 Vlan : 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)# </pre>

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 ethernet-source-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)# exit
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. <pre> fiberroad(config-if-gi1)# ip dhcp snooping rate-limit 30 fiberroad(config-if-gi1)# 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 </pre>

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 show ip dhcp snooping interface statistics command. <pre> 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 With Option82 Dropped Invalid Drop -----+-----+-----+-----+-----+-----+-----+-----+ gi1 0 0 0 0 0 0 0 </pre>

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. <pre>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)</pre>

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. <pre>switch# show ip dhcp snooping interface g 1 switch# show ip dhcp snooping interfaces g1 statistics</pre> <pre> Interfaces Trust State Rate (pps) hwaddr Check Insert Option82 ----- ----- ----- ----- ----- g1 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 ----- ----- ----- ----- ----- ----- g1 0 0 0 0 0 Switch#</pre>

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. <pre> switch# show ip dhcp snooping binding Bind Table: Maximum Binding Entry Number 192<sup>4</sup> Port VID MAC Address IP Type Lease Time<sup>4</sup> -----+-----+-----+-----+-----+----- fa1 1 48:5B:39:C7:12:62 192.168.1.100(255.255.255.255) DHCP Snooping 86400<sup>4</sup> </pre>

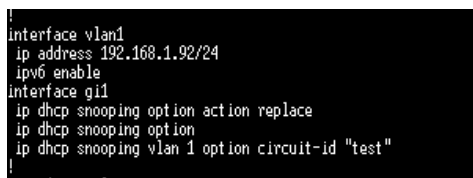
2.6.10 ip dhcp snooping option

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. <pre> 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: ZLLDP-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 </pre>

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. <pre>switch(config)# interface gil switch(config-if)# ip dhcp snooping option action replace</pre> <pre>interface vlan1 ip address 192.168.1.92/24 ipv6 enable interface gil ip dhcp snooping option action replace ip dhcp snooping option !</pre>	

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 <pre>switch(config)# interface gi1 switch(config-if)# ip dhcp snooping vlan 1 option circuit-id test</pre>  <pre>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"</pre>	

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 <pre>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</pre>

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 <pre>switch(config)# do show ip dhcp snooping option remote-id</pre>

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 show 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 Succeeded 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. <pre> 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 Succeeded 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 </pre>	

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 Succeeded 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 database.

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 Succeeded 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 show 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 Succeeded 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: Maximum 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 Succeeded 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-sport1024-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|xmas-deny|nullscan-deny|syn-sport1024-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-sport1024-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. <pre>Switch(config)# dos ipv6-min-frag-size-length 1024 Switch(config)# dos ipv6-min-frag-size-check</pre>	

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. <pre>Switch(config)# interface g 1 Switch(config-if)# dos</pre>

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 Privileged EXEC mode.
Example	The following example shows the global DoS protection configuration. <pre>Switch(config)# do show dos interfaces g 1 Port DoS Protection ----- gi1 enabled</pre> <pre>Switch(config)# do show dos Type State (Length) ----- DHMAC 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) Snurf 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</pre>

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. <pre>switch(config)# ip arp inspection switch(config)# ip arp inspection vlan 1 switch(config)# show ip arp inspection</pre>

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. <pre>switch(config)# interface g 1 switch(config)# ip arp inspection rate-limit 30 switch(config)# do show ip arp inspection interface g 1</pre>	

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. <pre>switch# clear ip arp inspection interfaces gil statistics switch# show ip arp inspection interfaces gil statistics</pre>	

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 <code>switch(config)# show ip arp inspection</code>

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	<code>switch# show ip arp inspection interface g 1</code> <code>switch# show ip arp inspection interfaces g 1 statistics</code>

2.9 GVRP

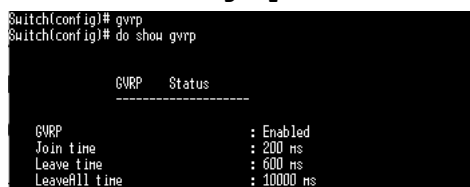
2.9.1 gvrp(Global)

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 gil
```

```
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: 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. <pre>Switch(config)# interface g 1 Switch(config-if)# gvrp registration-mode fixed Switch# show gvrp configuration interfaces g 1</pre> <pre>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</pre>

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	<table> <tr> <td>(error-statistics statistics)</td><td>Error-statistics: error gvrp packet statistics Statistics: gvrp event message</td></tr> <tr> <td>[interfaces IF_PORTS]</td><td>statistics Specifies posts to clear statistics</td></tr> </table>	(error-statistics statistics)	Error-statistics: error gvrp packet statistics Statistics: gvrp event message	[interfaces IF_PORTS]	statistics Specifies posts to clear statistics
(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				

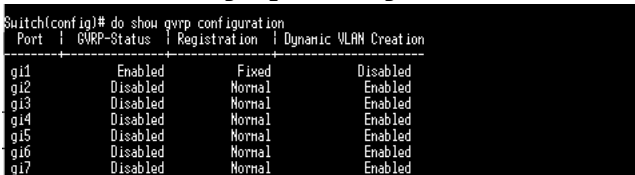
2.9.6 show gvrp statistics

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. <pre>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 JoinEmpty TX : 0 JoinIn TX : 0 Empty TX : 0 LeaveIn TX : 0 LeaveEmpty TX : 0 LeaveAll TX : 0 --More--</pre> <pre>Switch# show gvrp error-statistics Switch(config)# show gvrp error-statistics Legend: INVPROT : Invalid protocol Id INVATYP : Invalid Attribute Type INVLEN : Invalid Attribute Length INVVAL : Invalid Attribute Value INNEVENT: Invalid Event Port INVPROT INVATYP INVLEN INVVAL INNEVENT 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--</pre>	

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. <pre>Switch# show gvrp Switch(config)# do show gvrp</pre>  <pre> GVRP Status ----- GVRP : Enabled Join time : 200 ms Leave time : 600 ms LeaveAll time : 10000 ms </pre>

2.9.8 show gvrp configuration

Syntax	show gvrp configuration [interface IF_PORTS]				
Parameter	<table> <tr> <td>none</td><td>Display all ports configuration</td></tr> <tr> <td>(statistics error-statistics)</td><td>Display Specifies posts configuration</td></tr> </table>	none	Display all ports configuration	(statistics error-statistics)	Display Specifies posts configuration
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. <pre>Switch# show gvrp configuration Switch(config)# do show gvrp configuration</pre>  <pre> 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 </pre>				

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-suppression 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. <pre>Switch(config)# ip igmp snooping Switch(config)# ip igmp snooping unknown-multicast action router-port</pre>	

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	<table><tr><td>VLAN-LIST</td><td>specifies VLAN ID list to set</td></tr><tr><td>last-member-query-count <1-7></td><td>specifies last member query count to set.</td></tr></table>	VLAN-LIST	specifies VLAN ID list to set	last-member-query-count <1-7>	specifies last member query count to set.
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.

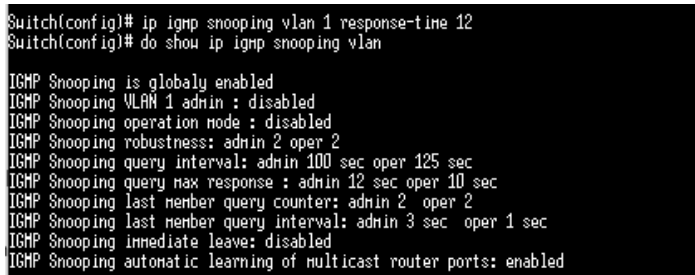
```
Switch(config)# ip igmp snooping vlan 1 last-member-query-interval 3
```

```
Switch(config)# do show ip igmp snooping vlan
IGMP Snooping is globally 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
```

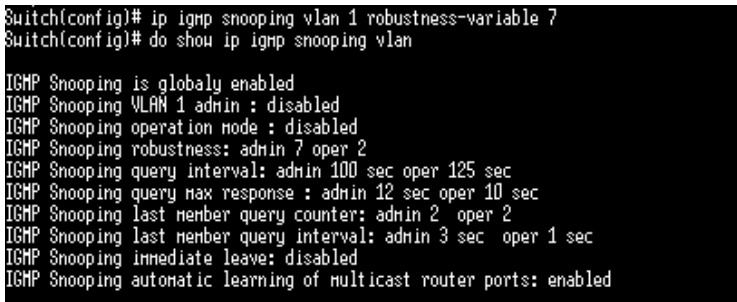
2.10.10 ip igmp snooping vlan query-interval

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. <pre>Switch(config)# ip igmp snooping vlan 1 query-interval 100 Switch(config)# do show ip igmp snooping vlan IGMP Snooping is globally 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</pre>	

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 	

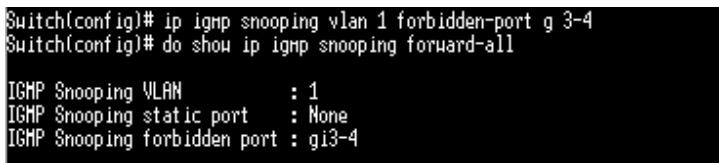
2.10.12 ip igmp snooping vlan robustness-variable

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. <pre>Switch(config)# ip igmp snooping vlan 1 robustness-variable</pre>  <pre>Switch(config)# ip igmp snooping vlan 1 robustness-variable 7 Switch(config)# do show ip igmp snooping vlan IGMP Snooping is globally 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</pre>	

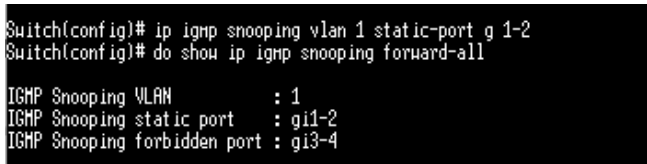
2.10.13 ip igmp snooping vlan router

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. <pre>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 globally 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</pre>

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. <pre>Switch(config)# ip igmp snooping vlan 1 forbidden-port g 3-4</pre>  <pre>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</pre>	

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. <pre>Switch(config)# ip igmp snooping vlan 1 static-port g 1-2</pre>  <pre>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</pre>	

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

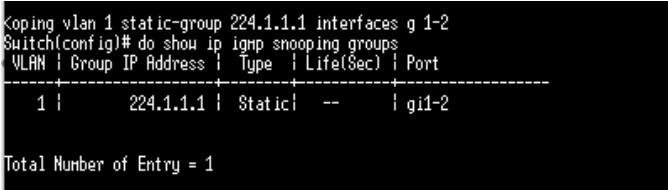
Total Entry 1
```

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
```



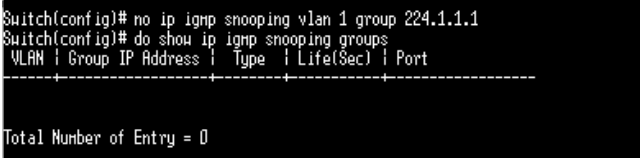
```

Koping 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. <pre>Switch(config) # no ip igmp snooping vlan 1 group 224.1.1.1</pre>  <pre>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</pre>	

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. <pre>Switch(config) # ip igmp profile 1 Switch(config-igmp-profile) # profile range ip 224.1.1.1 224.1.1.8 action permit</pre>	

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 profile 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 g1 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		
	<table> <tr> <td><0-1024></td><td>The maximum number of IGMP groups that an interface can join</td></tr> </table>	<0-1024>	The maximum number of IGMP groups that an interface can join
<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. <pre>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</pre>		

2.10.24 ip igmp 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. <code>Switch(config-if) #ip igmp max-groups action replace</code>	

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. <code>Switch# clear ip igmp snooping groups</code> <code>Switch# show ip igmp snooping groups</code>	

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

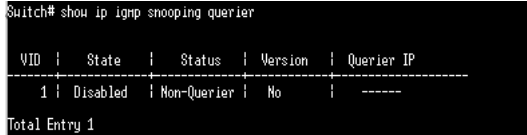
2.10.27 show ip igmp snooping groups

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. <pre>Switch# show ip igmp snooping router</pre>  <pre>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</pre>	

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. <pre>Switch# show ip igmp snooping querier</pre> 

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. <pre>Switch# show ip igmp snooping</pre> 

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.	
	<pre>Switch# show ip igmp snooping vlan 1 Switch# show ip igmp snooping vlan 1 IGMP Snooping is globally 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</pre>	

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.	
	<pre>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</pre>	

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-gi1)# ip igmp max-groups action replace
Switch(config-if-gi1)# 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

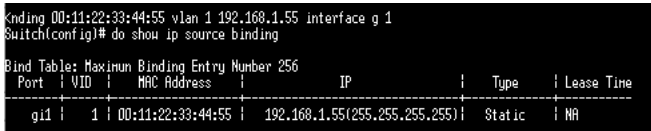
```

2.11 IP Source Guard

2.11.1 ip source verify

Syntax	ip source verify [mac-and-ip] / no ip source verify
Parameter	<u>mac-and-ip</u> 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. <pre>Switch(config)# interface g 1 switch(config-if)# ip source verify</pre> The example shows how to enable IP Source Guard with source IP and MAC address filtering on interface g 2. <pre>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</pre> <pre>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</pre>

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. <pre>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</pre>  <pre>Binding 00:11:22:33:44:55 vlan 1 192.168.1.55 interface g 1 Switch(config)# do show ip source binding</pre> <table><tr><th colspan="6">Bind Table: Maximum Binding Entry Number 256</th></tr><tr><th>Port</th><th>VID</th><th>MAC Address</th><th>IP</th><th>Type</th><th>Lease Time</th></tr><tr><td>gi1</td><td>1</td><td>00:11:22:33:44:55</td><td>192.168.1.55(255.255.255.255)</td><td>Static</td><td>NA</td></tr></table>			Bind Table: Maximum 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
Bind Table: Maximum 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 <pre>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</pre>

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. <pre>switch# show ip source binding Switch(config)# do show ip source binding Bind Table: Maximum 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</pre>

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: g1-3
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 HJEyHzJmHjk3VTU3YTVhNzQzODk0VVBINGE4MDFhYzZM=

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 00:00:1E "Pingtel"
voice-vlan oui-table 00:01:E3 "Siemens"
voice-vlan oui-table 00:60:89 "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 LACP 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)# no 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: $TTL = (tx\text{-}interval * holdtime\text{-}multiplier)$. 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. <pre>Switch(config)# lldp holdtime-multiplier 3 Switch# show lldp Switch(config)# lldp holdtime-multiplier 3 Switch(config)# do show lldp State: Enabled Timer: 40 Seconds Hold multiplier: 3 Reinit delay: 5 Seconds Tx delay: 2 Seconds LLDP packet handling: Flooding</pre>

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 disabled, 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 MED is 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. <pre>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</pre>

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 ADDR	Location type to be configured. "ecs-elin" is abbreviation of emergency call service – emergency location identifier number 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	Default 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
112233445566778899AABBCCDDEEFF00
Switch(config-if)# lldp med location civic-address
112233445566
Switch(config-if)# lldp med location ecs-elin
112233445566778899AA
Switch# show lldp interfaces g 1 med
Switch(config)# int g 1
Med 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
g1	Yes	Yes	No	No	N/A

```

Port ID: g1
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	Specify the network policy application type.
	video-conferencing	
	streaming-video	
	video-signaling	
	<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
```

```

Network-policy 1 app voice-signaling vlan 2 vlan-type tag priority 3 dscp 4
Network-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	lldp 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. <pre> Switch (config) # lldp med network-policy auto Switch (config) # no lldp med network-policy auto </pre>
----------------	---

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
Switch(config-if)# 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 “ldp tlv-select” command to attach selected TLV in PDU. The configuration could be shown by “show 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. <pre>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</pre>		

2.13.15 lldp tlv-select pvid

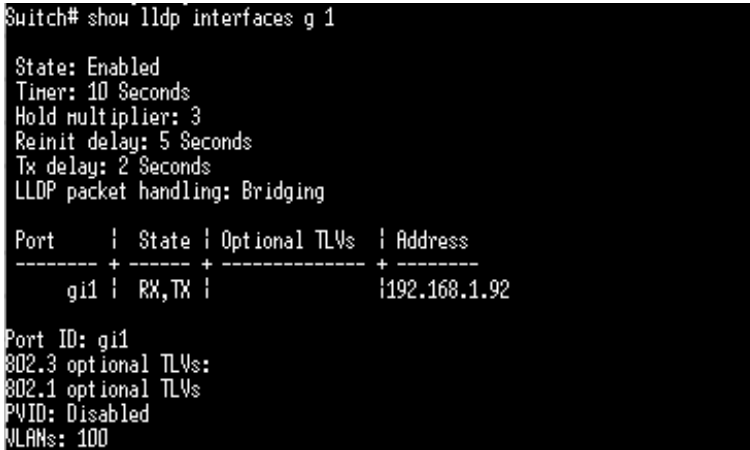
Syntax	lldp tlv-select pvid (disable enable) no lldp tlv-select pvid	
Parameter	disable	Disable LLDP 802.1 PVID TLV attach state
	enable	Enable LLDP 802.1 PVID TLV attach state
Default	Default is enabled	
Mode	Port Configuration	
Usage	Use “ lldp tlv-select pvid ” command to configure the 802.1 PVID 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. <pre> 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 </pre>	

2.13.16 lldp tlv-select vlan-name

Syntax	lldp tlv-select vlan-name (add remove) VLAN-LIST
Parameter	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. add VLAN-LIST 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 I 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. <pre>Switch(config)# lldp tx-delay 10 Switch# show lldp</pre>

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
OSCP: 4
LLDP-MED Network policy
Application type: Video Conferencing
Flags: Defined
VLAN ID: 5
Layer 2 priority: 1
OSCP: 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
MLAN ID: 2 tagged
Layer 2 priority: 3
DSCP: 4

Network policy 32
-----
Application type: Conferencing
MLAN 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	20:98:E6:12:39:18	20:98:E6:12:39:18			3146
gi24	28:80:23:08:68:7F	28:80:23:08:68:7F			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:8D:4A	64:51:06:9F:8D: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
```

Port	Tx Frames Total	Total	Rx Frames Discarded	Errors	Discarded	Rx TLVs Unrecognized	Rx Ageouts 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:
```

Port	Tx Frames Total	Total	Rx Frames Discarded	Errors	Discarded	Rx TLVs Unrecognized	Rx Ageouts 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. <pre>Switch# clear logging buffered Switch# clear logging file</pre>

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. <pre>Switch(config)# no logging Switch(config)# logging</pre>

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. <pre>Switch(config)# logging host 1.2.3.4 Switch(config)# logging host SYSLOG</pre>	

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	Privileged 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-SVSTINFO_CHKSUM_ERROR: partition checksum error
*Jan 01 2022 09:43:22: SYSTEM-3-SVSTINFO_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# 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	Delete all dynamic addresses learned on the specific interface.
	IF_PORTS	
	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 Privileged 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		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.
	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 aging 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 unicast 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	Display the MAC addresses entries for a specific
	IF_PORTS	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 Privileged EXEC mode.

Example The following example displays the entire 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:F8:AC	Management	CPU
1	00:20:68:66:50:00	Dynamic	gi24
1	00:EO:4C:36:01:AA	Dynamic	gi24
1	00:EO: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:44:32:30:60:3A	Dynamic	gi24
1	20:98:E6:12:39:18	Dynamic	gi24
1	28:80:23:08:68:7F	Dynamic	gi24
1	30:80:99:15: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:D9:0A	Dynamic	gi24
1	3C:A8:2A:86:98:B1	Dynamic	gi24
1	50:9A:4C:3E:08:3F	Dynamic	gi24
1	50:E5:49:19:10:87	Dynamic	gi24
1	50:FA:84:CD:94:E9	Dynamic	gi24
1	54:E1:AD:AB:63:ED	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
VlID | 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 address table, use the command show mac address-table counters in the Privileged EXEC mode.
Example	The following example displays 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 Privileged 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	<table> <tr> <td><1-2147483647></td><td>Specify the group ID</td></tr> <tr> <td>Mac-address</td><td>Specify the MAC address to be mapped.</td></tr> <tr> <td><9-48></td><td>Specify the mask length of MAC address.</td></tr> </table>	<1-2147483647>	Specify the group ID	Mac-address	Specify the MAC address to be mapped.	<9-48>	Specify the mask length of MAC address.
<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. <pre>Switch(config)# Interface g 1 Switch(config-if)# vlan mac-vlan group 333 VLAN 100</pre>	

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. <pre>Switch# show vlan mac-vlan groups</pre>

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 <pre>Switch# show vlan mac-vlan interfaces g 1</pre>	

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" <pre>Switch(config)# management access-list test</pre>	

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" <pre>Switch(config) # management access-list test</pre>	

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. <pre>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</pre>

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_PORTSservice (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. <pre>Switch(config)# mirror session 1 destination interface g 1 Switch# show mirror session 1 Session 1 Configuration Source RX</pre>	

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 <code>Switch(config) # show mirror</code>	

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. <code>Switch(config) # ipv6 mld snooping</code>	

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. <pre>Switch(config) # ipv6 mld snooping unknown-multicast action router-port</pre>	

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. <pre>Switch(config) # ipv6 mld snooping vlan 1</pre>	

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	<table> <tr> <td>VLAN-LIST</td><td>specifies VLAN ID list to set</td></tr> <tr> <td>last-member-query-count <1-7></td><td>specifies last member query count to set. Default is 2</td></tr> <tr> <td>last-member-query-interval <1-60></td><td>specifies last member query interval to set. Default is 1</td></tr> <tr> <td>query-interval <30-18000></td><td>specifies query interval to set. Default is 125</td></tr> <tr> <td>response-time <5-20></td><td>specifies a response time to set. default is 10</td></tr> <tr> <td>robustness-variable <1-7></td><td>specifies a robustness value to set, default is 2</td></tr> </table>	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 is 125	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
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 is 125												
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. <pre>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</pre>												

```

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 globally 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. <pre>Switch(config) # ipv6 mld snooping vlan 1 fastleave</pre>

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	<table><tr><td><i>VLAN-LIST</i></td><td>specifies VLAN ID list to set</td></tr><tr><td><i>last-member-query-count</i> <1-7></td><td>specifies last member query count to set</td></tr></table>		<i>VLAN-LIST</i>	specifies VLAN ID list to set	<i>last-member-query-count</i> <1-7>	specifies last member query count to set
<i>VLAN-LIST</i>	specifies VLAN ID list to set					
<i>last-member-query-count</i> <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 specifies last member query interval to set <1-60>	
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 globally 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 globally 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. <pre>Switch(config) # ipv6 mld snooping vlan 1 query-interval 100</pre>	

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	<i>VLAN-LIST</i>	specifies VLAN ID list to set
	<i>Response-time</i> <i><5-20></i>	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	<i>VLAN-LIST</i>	specifies VLAN ID list to set
	<i>robustness-variable</i> <i><1-7></i>	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	<i>VLAN-LIST</i> 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	<i>VLAN-LIST</i> specifies VLAN ID list to set <i>IF_PORTS</i> 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	<i>VLAN-LIST</i>	specifies VLAN ID list to set
	<i>IF_PORTS</i>	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. <pre>Switch(config) # ipv6 mld snooping vlan 1 forbidden router-port gi2</pre>	

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	<i>VLAN-LIST</i>	specifies VLAN ID list to set
	<i>IF_PORTS</i>	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. <pre>Switch(config) # ipv6 mld snooping vlan 1 static-router-port gi1-2</pre>	

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	<i>VLAN-LIST</i>	specifies VLAN ID list to set
	<i>Ipv6-addr</i>	specifies multicast group ipv6 address
	<i>IF_PORTS</i>	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. <pre>Switch(config) # ipv6 mld snooping vlan 1 static-group ff13::1 interfaces gil-2</pre>	

2.19.18 ipv6 mld snooping vlan group

Syntax	no ipv6 mld snooping vlan <VLAN-LIST> group <ipv6-addr>	
Parameter	<i>VLAN-LIST</i>	specifies VLAN ID list to set
	<i>Ipv6-addr</i>	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. <pre>Switch(config) # no ip igmp snooping vlan 1 group ff13::1</pre>	

2.19.19 profile range

Syntax	profile range ipv6 <ipv6-addr> [ipv6-addr] action (permit deny)	
Parameter	<i><ipv6-addr></i>	Start ipv6 multicast address
	<i>[ipv6-addr]</i>	End ipv6 multicast address
	<i>(permit deny)</i>	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	<i><1-128></i>	specifies profile ID
Default	No profile 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
	[<i>interfaces</i> <i>IF_PORTS</i>]	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. <pre>Switch(config)# interface gil Switch(config-if)# ipv6 mld filter 1</pre>	

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. <pre>Switch(config)# interface gil Switch(config-if)# ipv6 mld max-groups 10</pre>	

2.19.23 ip igmp max-groups action

Syntax	ipv6 mld max-groups action (deny replace)	
Parameter		Deny: current port igmp group arrived max-groups, don't add group.
	(deny replace)	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. <pre>Switch(config-if) #ipv6 mld max-groups action replace</pre>	

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. <pre>Switch# clear ipv6 mld snooping groups static</pre>	

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. <pre>Switch# show ipv6 mld snooping vlan 1 Switch# show ipv6 mld snooping vlan 1 MLD Snooping is globally 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</pre>	

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. <pre>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</pre>	

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	

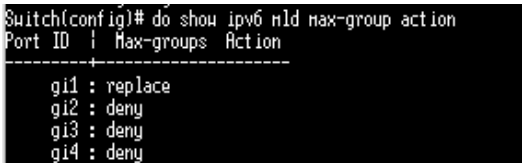
2.19.33 show ipv6 mld filter

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. <pre>Switch(config-if) # ipv6 mld max-groups 50 Switch# show ipv6 mld max-group</pre>	

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. <pre>Switch(config-if) # ipv6 mld max-groups action replace Switch# show ipv6 mld max-group action</pre>  <pre>Switch(config)# do show ipv6 mld max-group action Port ID Max-groups Action ----- ----- gi1 : replace gi2 : deny gi3 : deny gi4 : deny</pre>	

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. <pre>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</pre>

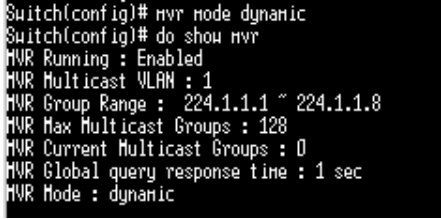
2.20.2 mvr vlan

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. <pre>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</pre>

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. <pre>Switch(config)# mvr Switch(config)# mvr group 224.1.1.1 8</pre> The operation will delete the MVR VLAN groups include static MVR groups.Continue? [yes/no]:y <pre>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</pre>	

2.20.4 mvr mode

Syntax	mvr mode (dynamic compatible)
Parameter	dynamic: Allows dynamic MVR membership on source ports (dynamic compatible) 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  <pre>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</pre>

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. <pre>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</pre>	

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. <pre>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</pre>	

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) <pre>Switch(config)# interface gi2 Switch(config-if)#mvr immediate Switch(config-if)#exit Switch(config)# exit Switch# show mvr interface</pre>

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) <pre>Switch(config) # mvr vlan 2 group 224.1.1.1 interfaces gi2 Switch# show mvr members</pre>	

2.20.9 clear mvr members

Syntax	clear mvr members [dynamic static]	
Parameter	dynamic	specifies MVR dynamic group
	static	specifies MVR static group
Default	Clear all of mvr group	
Mode	Privileged EXEC	
Usage	This command will clear the mvr groups for selected type.	
Example	The following example specifies that clear all mvr groups test. Switch# clear mvr members	

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. <pre>Switch(config) # interface g 1 Switch(config-if) # no back-pressure</pre> This example shows how to show current jumbo-frame size <pre>Switch# show running-config interface g 1</pre> <pre>! interface vlan1 ip address 192.168.1.92/24 ipv6 enable interface gi1 no back-pressure !</pre>

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. <pre>Switch(config)# clear interfaces g 1 counters</pre> This example shows how to show current counters <pre>Switch# show interfaces g 1</pre>

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. <pre>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"</pre> <pre>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</pre>

2.21.4 duplex

Syntax	duplex (auto full half)						
Parameter	<table> <tr> <td>auto</td><td>Specify port duplex to auto negotiation.</td></tr> <tr> <td>full</td><td>Specify port duplex to force full duplex</td></tr> <tr> <td>half</td><td>Specify port duplex to force half duplex</td></tr> </table>	auto	Specify port duplex to auto negotiation.	full	Specify port duplex to force full duplex	half	Specify port duplex to force half duplex
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. <pre>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" !</pre> This example shows how to show current interface link speed <pre>Switch# show interfaces g 1-2 status</pre> <pre>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</pre>						

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. <pre>Switch(config) # interface g 1 Switch(config-if) # eee</pre> This example shows how to show current jumbo-frame size <pre>Switch# show running-config interface g 1</pre> <pre>Switch(config)# do show running-config interfaces g 1 interface gi1 eee duplex full no back-pressure description "userport"</pre>

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-frame 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 protected	
Parameter	IF_PORTS	Specify 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# <code>show interfaces g 1</code> 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	<table border="1"> <tr> <td>10</td><td>Specify port speed to force 10Mbps/s or auto with 10Mbps/s ability.</td></tr> <tr> <td>100</td><td>Specify port speed to force 100Mbps/s or auto with 100Mbps/s ability.</td></tr> <tr> <td>1000</td><td>Specify port speed to force 1000Mbps/s or auto with 1000Mbps/s ability.</td></tr> <tr> <td>10/100</td><td>Specify port speed to auto with 10Mbps/s and 100Mbps/s</td></tr> </table>	10	Specify port speed to force 10Mbps/s or auto with 10Mbps/s ability.	100	Specify port speed to force 100Mbps/s or auto with 100Mbps/s ability.	1000	Specify port speed to force 1000Mbps/s or auto with 1000Mbps/s ability.	10/100	Specify port speed to auto with 10Mbps/s and 100Mbps/s
10	Specify port speed to force 10Mbps/s or auto with 10Mbps/s ability.								
100	Specify port speed to force 100Mbps/s or auto with 100Mbps/s ability.								
1000	Specify port speed to force 1000Mbps/s or auto with 1000Mbps/s ability.								
10/100	Specify port speed to auto with 10Mbps/s and 100Mbps/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
!
  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. <pre>Switch(config)# interface g 1 Switch(config-if)# shutdown</pre> This example shows how to show current admin state configuration <pre>Switch# show running-config interfaces g 1</pre>

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 flooding 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-loop cause. <pre>Switch(config) # errdisable recovery cause bpduguard Switch(config) # errdisable recovery cause selfloop</pre>	

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 valid 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 recovery interval in the Global Configuration mode.	
Example	The following example set the aging time to 500 seconds.	
	<pre>Switch(config) # errdisable recovery interval 60</pre>	

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.	
	<pre>Switch# show errdisable recovery</pre>	

```
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

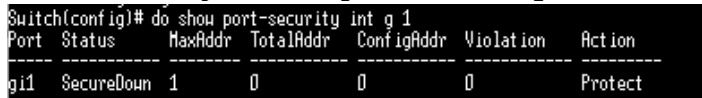
Interfaces that will be enabled at the next timeout:
Port | Error Disable Reason    | Time Left
```

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 <i>show port-security</i> 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 

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 show 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. <pre> 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 </pre>	

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	<table> <tr> <td><1-8></td><td>Specify protocol vlan group to configure</td></tr> <tr> <td>(ethernet_ii llc_other snap_1042)</td><td>Specify protocol based frame type</td></tr> <tr> <td>VALUE</td><td>Specify protocol value to configure</td></tr> </table>	<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
<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
Kvlan group 1 frame-type ethernet_ii protocol-value 0x806
Kol-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	<table> <tr> <td>IF_PORTS</td><td>Specify interfaces protocol vlan to display</td></tr> </table>	IF_PORTS	Specify interfaces protocol vlan to display
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 <pre>Switch# show vlan protocol-vlan interfaces g 1</pre>		

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. <pre>Switch(config)# qos</pre> This example shows how to check current qos mode. <pre>Switch# show qos Switch(config)# qos Switch(config)# do show qos QoS Mode: basic Basic trust: cos</pre>

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 the 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 qos remark” command to disable it.	
Example	This example shows how to enable remarking features on interface fa1. <pre>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</pre>	

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. <pre>Switch(config) # qos trust cos Switch(config) # qos trust cos-dscp Switch(config) # qos trust dscp Switch(config) # qos trust precedence</pre> This example shows how to check current qos trust type. <pre>Switch# show qos</pre>	

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. <pre>Switch(config)# interface GigabitEthernet 1 Switch(config-if)# no qos trust Switch(config-if)# end Switch# show qos interface GigabitEthernet 1</pre>

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. <pre>Switch# show qos</pre>

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 “ show 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 g1 Switch(config-if) # rate-limit egress 2048 Switch# show running-config interfaces g1 

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 show running-config interfaces command.	
Example	The following example show how to configure ingress port rate limit and egress port shaper. <pre> Switch(config) # interfaces gil Switch(config-if) # rate-limit egress queue 3 2048 Switch# show running-config interfaces gil Switch(config)# do show running-config interfaces g 1 interface gil rate-limit egress 2048 rate-limit egress queue 3 2048 </pre>	

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. <pre> Switch(config) # interfaces gil Switch(config-if) # rate-limit ingress 128 Switch# show running-config interfaces gil Switch(config)# show running-config int g 1 interface gil rate-limit ingress 128 rate-limit egress 2048 rate-limit egress queue 3 2048 </pre>	

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 event 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. <pre>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</pre>	

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 etherStat statistics of interface.
Example	The example shows how to show RMON etherStat statistics of interface gi1. <pre>switch(config)# show rmon interfaces gi1 statistics</pre>

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. <pre>switch(config)# rmon event 1 log trap public description test owner admin switch(config)# show rmon event 1</pre> <pre>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</pre>

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 gil 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 : gil
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. <pre>switch(config)# rmon history 1 interface gi1 interval 30 owner admin switch(config)# show rmon history 1</pre>  <pre>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</pre>	

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 <pre>switch(config)# show rmon history 1 statistics</pre>	

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 engineid 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. <pre>Switch# show snmp host</pre>

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. <pre>Switch# show snmp trap</pre>  <pre>Switch# show snmp trap SNMP auth failed trap : Enable SNMP linkUpDown trap : Enable SNMP cold-start trap : Enable SNMP warm-start trap : Enable</pre>

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. <pre>Switch# show snmp view</pre>

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. <pre>Switch# show snmp user</pre>

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 <pre>Switch(config)# snmp engineid 00036D001122</pre>	

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 <pre>Switch(config)# snmp engineid remote 192.168.1.11 00036D10000A</pre>	

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	<table><tr><td>group-name</td><td>Specify SNMP group name, and the maximum length is 30 characters.</td></tr><tr><td>(1 2c 3)</td><td>Specify the SNMP version.</td></tr><tr><td>noauth</td><td>Specify that no packet authentication is performed.</td></tr><tr><td>auth</td><td>Specify that no packet authentication without entryption is performed. It is applicable only to the SNMPv3 security mode.</td></tr><tr><td>priv</td><td>Specify that no packet authentication with entryption is performed. It is applicable only to the SNMPv3 security mode.</td></tr><tr><td>read-view read- view</td><td>Set the view name that enables configuring the agent, and its maximum length is 30 characters.</td></tr><tr><td>write-view write- view</td><td>Set the view name that enables viewing only, and its maximum length is 30 characters.</td></tr><tr><td>notify-view notify- view</td><td>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</td></tr></table>	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	
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 mapped to the SNMP views defined in this command. The security level for SNMP v1 or v2 is always noauth.																	
Example	The following example adds SNMPv3 group <pre>Switch(config)# snmp group v3 version 3 auth read-view all write-view all notify-view all</pre>																	

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 address of recipient.
	ipv6-addr	The IPv6 address of recipient.
	hostname	The host name of recipient.
	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 encryption is performed. It is applicable only to the SNMPv3 security mode.
	priv	Specify that no packet authentication with encryption 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 notifications, 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 recipient 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 <code>snmp user</code> in the Global Configuration mode; and use the <code>no</code> form to delete the SNMP user.	
Example	The following example adds SNMP user v3 into the group v3 by the MD5 authentication. <pre>Switch(config)# snmp user v3 v3 auth md5 12345678</pre>	

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 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 <code>snmp view</code> in the Global Configuration mode; and use the <code>no</code> 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 explicitly configured to an MSTP instance are mapped to the CIST instance (instance 0).	
	For two or more switches in the same MSTP region, 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 range 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 its 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. <pre>Switch# show spanning-tree</pre>

2.29.5 show spanning-tree interface

Syntax	show spanning-tree interface IF_PORTS [statistic]						
Parameter	<table><tr><td>interface</td><td>An interface ID or the list of interface IDs.</td></tr><tr><td>IF_PORTS</td><td></td></tr><tr><td>statistic</td><td>Display the STP statistic for an interface.</td></tr></table>	interface	An interface ID or the list of interface IDs.	IF_PORTS		statistic	Display the STP statistic for an interface.
interface	An interface ID or the list of interface IDs.						
IF_PORTS							
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. <pre>Switch# show spanning-tree interfaces g 23</pre> The following example shows the STP statistic for the interface fa23. <pre>Switch# show spanning-tree interfaces g 23 statistic</pre>						

2.29.6 show spanning-tree mst

Syntax	show spanning-tree mst instance-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 disabled.
	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) handling 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 filter 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. <pre>Switch(config)# interface gi1 Switch(config-if)# spanning-tree bpdu-guard</pre>

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 2000000000; 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). <table><tr><th>Interface</th><th>Long</th><th>Short</th></tr><tr><td>Gigabit Ethernet (1000Mbps)</td><td>20000</td><td>4</td></tr><tr><td>Fast Ethernet (100Mbps)</td><td>200000</td><td>19</td></tr><tr><td>Ethernet (10Mbps)</td><td>2000000</td><td>100</td></tr></table>			Interface	Long	Short	Gigabit Ethernet (1000Mbps)	20000	4	Fast Ethernet (100Mbps)	200000	19	Ethernet (10Mbps)	2000000	100
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 g1  
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 should be maintained:

$$2 * (\text{forward-time} - 1) \geq \text{Max-Age}$$

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	seconds STP hello time in second. Its valid range is from 1 to 10 seconds.
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: $\text{Max-Age} \geq 2 * (\text{hello-time} + 1)$
Example	The following example configures BPDU hello time to 4. <pre>Switch(config) # spanning-tree hello-time 4</pre>

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. <pre>Switch(config) # interface g 1 Switch(config-if) # spanning-tree edge</pre>

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.	
	<pre>Switch(config)# interface g 1 Switch(config-if)# spanning-tree link-type point-to-point</pre>	

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: $2 * (\text{forward-time} - 1) \geq \text{Max-Age} \geq 2 * (\text{hello-time} + 1)$	

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 forcibly 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. <pre>Switch(config)# spanning-tree mst configuration Switch(config-mst)# instance 1 vlan 10-20 Switch(config-mst)# name fiberroad Switch(config-mst)# revision 1</pre>

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). <table> <tr> <th>Interface</th><th>Long</th><th>Short</th></tr> <tr> <td>Gigabit Ethernet (1000Mbps)</td><td>20000</td><td>4</td></tr> <tr> <td>Fast Ethernet (100Mbps)</td><td>200000</td><td>19</td></tr> <tr> <td>Ethernet (10Mbps)</td><td>2000000</td><td>100</td></tr> </table>		Interface	Long	Short	Gigabit Ethernet (1000Mbps)	20000	4	Fast Ethernet (100Mbps)	200000	19	Ethernet (10Mbps)	2000000	100
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 <code>spanning-tree mst cost</code> 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 <code>no</code> form of the command. When configuring the path cost on the CIST (instance 0), it is equal to the command <code>spanning-tree cost</code> in the Interface Configuration mode.
Example	The following example configures the path cost of interface fa1 on the instance 1 to 30000 <pre>Switch(config)# interface gi1 Switch(config-if)# spanning-tree mst 1 cost 30000</pre>

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 <code>spanning-tree mst port-priority</code> in the Interface Configuration mode. For the default configuration, use the <code>no</code> 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 <code>spanning-tree port-priority</code> 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 <pre>Switch(config)# interface gi1 Switch(config-if)# spanning-tree mst 1 port-priority 144 Switch(config-if)# spanning-tree mst 0 port-priority 96</pre>	

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 probability 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. <pre>Switch(config)# spanning-tree mst 0 priority 4096 Switch(config)# spanning-tree mst 1 priority 4096</pre>	

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 through 65535; Otherwise, it calculates the path cost in the range 1 to 200000000.	
Example	The following example modifies path cost method to short.	
	<pre>Switch(config)# spanning-tree pathcost method short</pre>	

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 .	
	<pre>Switch(config)# interface gi2 Switch(config-if)# spanning-tree port-priority 96</pre>	

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 ensures the probability 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 switches 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. <pre>Switch(config) # spanning-tree priority 4096</pre>	

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. <pre>Switch(config) # spanning-tree tx-hold-count 4</pre>	

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
-----|-----|-----|-----|-----|-----
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	<table> <tr> <td>broadcast</td><td>Select broadcast storm control type</td></tr> <tr> <td>unknown-unicast</td><td>Select unknown unicast storm control type</td></tr> <tr> <td>unknown-multicast</td><td>Select unknown multicast storm control type</td></tr> </table>	broadcast	Select broadcast storm control type	unknown-unicast	Select unknown unicast storm control type	unknown-multicast	Select unknown multicast storm control type
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. <pre>Switch(config) # interface gi1 Switch(config-if) # storm-control</pre> This example shows how to enable broadcast storm control and configure broadcast storm control rate to 200. <pre>Switch(config) # interface gi1 Switch(config-if) # storm-control broadcast</pre> 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 kbps	Unkown-Multicast kbps	Unkown-Unicast kbps	Action
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. <pre>Switch(config)# interface gi1 Switch(config-if)# storm-control action shutdown</pre> This example shows how to show storm control action on interface gi1. <pre>Switch# show storm-control interfaces gi1</pre> <pre>Switch(config)# do show storm-control int g 1</pre> <table><tr><th>Port</th><th>State</th><th>Broadcast kbps</th><th>Unkown-Multicast kbps</th><th>Unkown-Unicast kbps</th><th>Action</th></tr><tr><td>gi1</td><td>enable</td><td>Off(10000)</td><td>Off(10000)</td><td>Off(10000)</td><td>Shutdown</td></tr></table>	Port	State	Broadcast kbps	Unkown-Multicast kbps	Unkown-Unicast kbps	Action	gi1	enable	Off(10000)	Off(10000)	Off(10000)	Shutdown
Port	State	Broadcast kbps	Unkown-Multicast kbps	Unkown-Unicast kbps	Action								
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					
	<pre>Switch(config)# storm-control ifg include Switch(config)# do show storm-control Storm control preamble and IFG: Included Storm control unit: bps</pre>					
	Port	State	Broadcast kbps	Unkown-Multicast kbps	Unkown-Unicast kbps	Action
	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-gi1)# storm-control broadcast level 200
```

```
Switch(config-if-gi1)# exit
```

```
Switch(config)# eint
```

```
Incomplete command
```

```
Switch(config)# show storm-control int g 1
```

Port	State	Broadcast kbps	Unkown-Multicast kbps	Unknown-Unicast kbps	Action
gi1	enable	200	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	<table> <tr> <td>image0</td><td>Boot from flash image partition 0</td></tr> <tr> <td>image1</td><td>Boot from flash image partition 1</td></tr> </table>	image0	Boot from flash image partition 0	image1	Boot from flash image partition 1
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. <pre>Switch(config)# boot system image1</pre> Select "image1" Success This example shows how to show active image partition. <pre>Switch# show flash</pre>				

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 (running-config startup-config) backup-config
	Specify the file stored in flash to operation. Available files are: <pre>flash://startup-config flash://backup-config flash://rsa1 flash://rsa2 flash://dsa2 flash://image0 flash://image1 flash://ram.log flash://flash.log</pre>

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. <pre>Switch# copy running-config startupst-config</pre> This example shows how to backup running configuration to remote tftp server 192.168.1.111 with file name test1.cfg. <pre>Switch# copy running-config tftp://192.168.1.111/test1.cfg</pre> 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. <pre>Switch# copy tftp://192.168.1.111/test2.cfg startup-config</pre> 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. <pre>Switch# copy flash://dsa2 tftp://192.168.1.111/dsa2</pre>	

```
Uploading file...Please Wait...
Uploading Done
```

2.31.3 delete

Syntax	delete (startup-config backup-config flash://) delete system (image0 image1)										
Parameter	<table> <tr> <td>flash://</td><td>Specify the configuration file stored in flash to delete. Available files are: flash://startup-config flash://backup-config</td></tr> <tr> <td>startup-config</td><td>Delete startup configuration file</td></tr> <tr> <td>backup-config</td><td>Delete backup configuration file</td></tr> <tr> <td>image0</td><td>Delete flash image0.</td></tr> <tr> <td>image1</td><td>Delete flash image1.</td></tr> </table>	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.
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. <pre>Switch# delete backup-config</pre> This example shows how to delete backup firmware image from flash. <pre>Switch# delete system image1</pre> This example shows how to show file status in flash. <pre>Switch# show flash</pre>										

2.31.4 restore-defaults

Syntax	restore-defaults [interfaces IF_PORTS]	
Parameter	interfaces IF_PORTS	Specify port to restore its' running 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 startup-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' running 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 configuration 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.

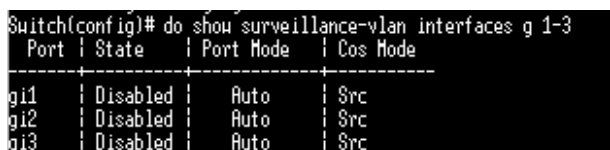
Example The following example shows how to enable Surveillance VLAN.

```
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
Administrative Surveillance VLAN state : disabled
Surveillance VLAN ID : none (disable)
Surveillance VLAN Aging : 1440 minutes
Surveillance VLAN CoS : 6
Surveillance VLAN Ip 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 <pre>Switch(config)#interface range g 1-3 Switch(config-if)#surveillance-vlan Switch# show surveillance-vlan interfaces g 1-3</pre>  <table><tr><th>Port</th><th>State</th><th>Port Mode</th><th>Cos Mode</th></tr><tr><td>gi1</td><td>Disabled</td><td>Auto</td><td>Src</td></tr><tr><td>gi2</td><td>Disabled</td><td>Auto</td><td>Src</td></tr><tr><td>gi3</td><td>Disabled</td><td>Auto</td><td>Src</td></tr></table>	Port	State	Port Mode	Cos Mode	gi1	Disabled	Auto	Src	gi2	Disabled	Auto	Src	gi3	Disabled	Auto	Src
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	<table> <tr> <td>A:B:C</td><td>Specify OUI Mac address to add or remove</td></tr> <tr> <td>startup-config</td><td>Specify description of the specified MAC address to the surveillance VLAN OUI table</td></tr> </table>	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
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 <pre>Switch(config)#interface range fa1-3 Switch(config-if)#surveillance-vlan mode manual Switch# show surveillance-vlan interfaces g 1-3</pre>

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 HOUR-OFFSET Minutes <1-59>	Specify acronym name of time zone Specify hour offset of time zone 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 ntp)	
Parameter	local	Specify to use static time
	ntp	Specify to use ntp time
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. <pre>switch(config)# clock source ntp switch(config)# show clock detail</pre>	

2.33.4 clock summer-time

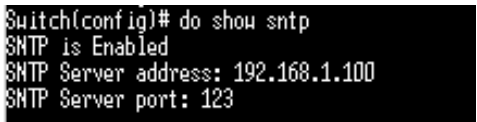
Syntax	clock summer-time ACRONYM date (jan feb mar apr may jun jul aug sep oct nov dec) <1-31> <2000-2037> HH:MM (jan feb mar apr may jun jul aug sep oct nov dec) <1-31> <2000-2037> HH:MM [<1-1440>] clock summer-time ACRONYM recurring (usa eu) [<1-1440>] clock summer-time ACRONYM recurring (<1-5> first 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	
	ACRONYM	Specify acronym name of time zone
	(jan feb mar apr may jun jul aug sep oct nov dec) <1-31> <2000-2037> HH:MM	Specify non-recurring daylight saving time duration.
	(jan feb mar apr may jun jul aug sep oct nov dec) <1-31> <2000-2037> HH:MM	

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 no v 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. <pre>switch(config)# clock summer-time test recurring usa switch(config)# show clock detail</pre>	

2.33.5 show clock

Syntax	show clock [detail]		
Parameter	<table> <tr> <td>detail</td><td>Show more detail information of clock</td></tr> </table>	detail	Show more detail information of clock
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. <pre>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</pre>		

2.33.6 sntp

Syntax	sntp host HOSTNAME [port <1-65535>] no sntp				
Parameter	<table> <tr> <td>HOSTNAME</td><td>Specify ip address or hostname of sntp server</td></tr> <tr> <td>sntp</td><td>Specify server port of sntp server</td></tr> </table>	HOSTNAME	Specify ip address or hostname of sntp server	sntp	Specify server port of sntp server
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. <pre>switch(config)# clock source sntp switch(config)# sntp host 192.168.1.100 switch(config)# show sntp</pre> 				

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 uddl

Syntax	uddl no uddl
Parameter	N/A
Default	UDLD is disabled by default.
Mode	Interface Configuration
Usage	Use the uddl 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 uddl interface Privileged EXEC command.
Example	The example shows how to enable UniDirectional Link Detection (UDLD) normal mode in interface gi 1. <pre>switch(config)# interface gi1 switch(config-if)# uddl</pre>

2.34.3 uddl aggressive

Syntax	uddl / aggressive no / uddl / aggressive
Parameter	N/A
Default	UDLD aggressive mode is disabled by default.
Mode	Interface Configuration
Usage	Use the uddl 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 uddl interface Privileged EXEC command.
Example	The example shows how to enable uddl aggressive mode in interface gi1. <pre>switch(config)# interface gi1 switch(config-if)# uddl</pre>

2.34.3 udd message time

Syntax	udd 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 udd 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. <code>switch(config)# udd message time 30</code>	

2.34.4 udd reset

Syntax	udd reset	
Parameter	N/A	
Default	No default is defined	
Mode	Privileged EXEC	
Usage	Use the udd 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 <code>Switch# udd reset</code>	

2.34.5 show udd

Syntax	show udd show udd interfaces IF_NMLPORTS	
Parameter	IF_NMLPORTS	Specify the normal interfaces to display udd information
Default	No default is defined	
Mode	Privileged EXEC	
Usage	Use the show udd 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 udd 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). <pre>Switch# configure Switch (config)# vlan 100 Switch# show vlan</pre>

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`. <pre>Switch(config)# vlan 100 Switch(config-vlan)# name VLAN-fiberroad Switch# show vlan</pre>

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. <pre>Switch(config) # interface g 12 Switch(config-if) # switchport mode access Switch# show interfaces switchport g12</pre>	

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 pvid is 1.	
Mode	Port Configuration	
Usage	Use the switch hybrid pvid 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 hybrid 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. <pre>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</pre>	

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. <pre>Switch(config)# interface g 10 Switch(config-if)# switchport mode access Switch(config-if)# switchport access vlan 100 Switch# show interfaces switchport g 10</pre>

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. <pre>Switch(config)# interface fa10 Switch(config-if)# switchport mode tunnel Switch(config-if)# switchport tunnel vlan 100 Switch# show interfaces switchport</pre>

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. <pre>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</pre>	

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 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 switchport Privileged EXEC command.	
Example	This example sets Trunk port g10 to add the allowed VLAN 100. <pre>Switch(config)# interface g 10 Switch(config-if)# switchport trunk allowed vlan add 100 Switch# show interfaces switchport g 10</pre>	

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 switchport Privileged EXEC command.	
Example	This example sets Trunk port fa10 to add the allowed VLAN 100. <pre>Switch(config)# interface g 10 Switch(config-if)# switchport trunk allowed vlan add 100 Switch# show interfaces switchport g 10</pre>	

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. <pre>Switch(config)# interface g 10 Switch(config-if)# switchport default-vlan tagged Switch# show interfaces switchport g 10</pre>	

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. <pre>Switch(config)# interface g 10 Switch(config-if)# switchport forbidden default- vlan Switch# show interfaces switchport g 10</pre>

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. <pre>Switch(config)# interface g 10 Switch (config-if)# switchport forbidden vlan add 100 Switch# show interfaces switchport g 10</pre>

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. <pre>Switch(config)# interface fa10 Switch(config-if)# switchport vlan tpid 0x9100</pre>

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 <pre>Switch(config)# management-vlan vlan 2</pre> (2) The following example specifies that management-vlan is restored to be default VLAN. <pre>Switch(config)# no management-vlan</pre>

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 <pre>Switch# show vlan</pre>	

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. <pre>Switch# show vlan 100 interfaces fa10 membership</pre>	

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. <pre>Switch(config) # interface g 10 Switch(config-if) # switchport trunk allowed vlan add 100 Switch# show interfaces switchport fa10</pre>	

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-status 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 <pre>Switch(config)#interface range g 1-3 Switch(config-if)#voice-vlan Switch# show voice-vlan interfaces g 1-3</pre>

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. <pre>Switch(config)# voice-vlan vlan 128 Switch# show voice-vlan</pre>

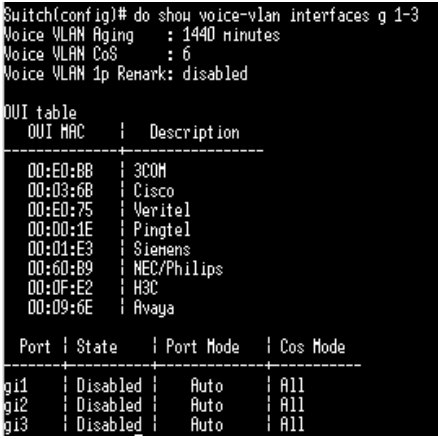
2.36.4 voice-vlan oui-table

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 show 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 show voice-vlan interfaces Privileged EXEC command	
Example	The following example how to configure voice packet QoS attributes on an interface <pre>Switch(config)#interface range g 1-3 Switch(config-if)#voice-vlan cos all Switch# show voice-vlan interfaces g 1-3</pre>  <pre>Switch(config)# do show voice-vlan interfaces g 1-3 Voice VLAN Aging : 1440 minutes Voice VLAN CoS : 6 Voice VLAN Ip Remark: disabled OUI table ----- OUI MAC Description ----- 00:E0:BB 3COM 00:03:68 Cisco 00:E0:75 Veritel 00:00:1E Pingtel 00:01:E3 Siemens 00:60:89 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</pre>	

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 <pre>Switch(config)#interface range g 1-3 Switch(config-if)#voice-vlan mode manual Switch# show voice-vlan interfaces g 1-3</pre>  <pre>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 00:00:1E Pingtel 00:01:E3 Siemens 00:60:89 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</pre>	

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. <pre>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</pre>	

2.36.9 show voice-vlan

Syntax	show voice-vlan show voice-vlan interfaces [IF_PORTS]	
Parameter	IF_PORTS	Specifies interfaces 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 <pre>Switch# show voice-vlan</pre>	

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. <pre>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</pre> <table><tr><th>IP Address</th><th>I/F</th><th>I/F Status</th><th>Type</th><th>Status</th><th>Roles</th></tr><tr><th></th><th></th><th>admin/oper</th><th></th><th></th><th></th></tr><tr><td>192.168.3.1/24</td><td>VLAN 2</td><td>UP/DOWN</td><td>Static</td><td>Valid</td><td>primary</td></tr></table>						IP Address	I/F	I/F Status	Type	Status	Roles			admin/oper				192.168.3.1/24	VLAN 2	UP/DOWN	Static	Valid	primary
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. <pre>Switch(config) # arp 192.168.3.22 00:00:11:11:11:11 vlan 2 Switch# show arp</pre>	

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. <pre>Switch(config) # interface vlan 2 Switch(config-if) # ipv6 enable Switch# show ipv6 interface vlan 2</pre>	

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. <pre>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 (TEN 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</pre>	

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. <pre>Switch(config)# ipv6 route 2002:01::01:01/96 2001:01::01:02 Switch# show ipv6 route static</pre>	

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. <pre>Switch(config)# ipv6 neighbor 2001:01::01:11 vlan 2 00:00:00:11:11:12 Switch# show ipv6 neighbors</pre>	

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 <pre>Switch# show erps instance all Erps status : enable Erps instance : 1 Erps ring status :disable Erps mel :0 Erps control vlan : 0 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</pre>

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. <pre>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 nel :0 Erps control vlan : 2 Erps HTR time : 5 min Erps guard time : 500 ms Erps work-node :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</pre>	

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 <pre>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</pre>	

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 HTR 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
```

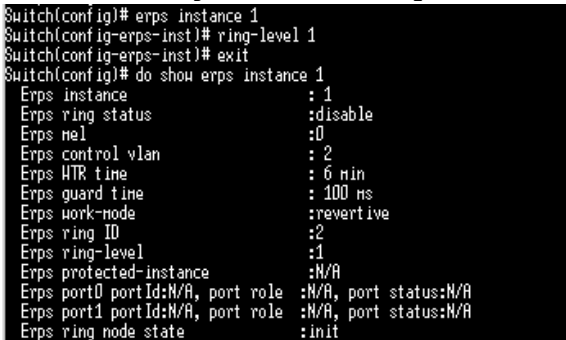
2.38.6 work-mode

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. <pre>Switch(config)# erps instance 1 Switch(config-erps-inst)# word-mode revertive Switch(config)# do show erps instance 1</pre>  <pre>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 HTR 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</pre>

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. <pre>Switch(config)# erps instance 1 Switch(config-erps-inst)# ring 2 Switch(config)# do show erps instance 1</pre>  <pre>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</pre>

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. <pre>Switch(config)# erps instance 1 Switch(config-erps-inst)# ring-level 1 Switch(config)# do show erps instance 1</pre>  <pre>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 HTR 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</pre>	

2.38.9 port

Syntax	port0 IF_PORTS (owner neighbour next-neighbour) port1 IF_PORTS (owner neighbour next-neighbour)
Parameter	IF_PORTS Specify the port number.
Default	Default is port1
Mode	erps configuration
Usage	Use the port0 IF_PORTS (owner neighbour 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 hel                : 0
Erps control vlan       : 2
Erps HTR 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. <pre>Switch(config)# erps instance 1 Switch(config-erps-inst)# mel 2 Switch(config)# do show erps instance 1</pre>  <pre>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</pre>

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 HTR 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

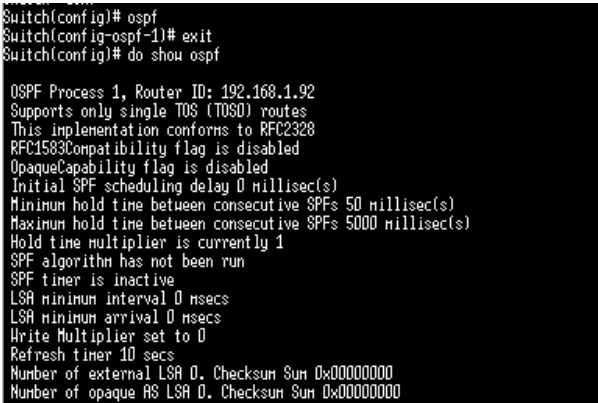
Syntax	show erps instance (all <0-15>)
Parameter	(all <0-15>) Specify the erps instance number
Default	N/A
Mode	erps configuration
Usage	Use the show erps instance command to show the specific erps instance
Example	The following example shows how to configure to show the erps instance.

Switch# show erps instance 1

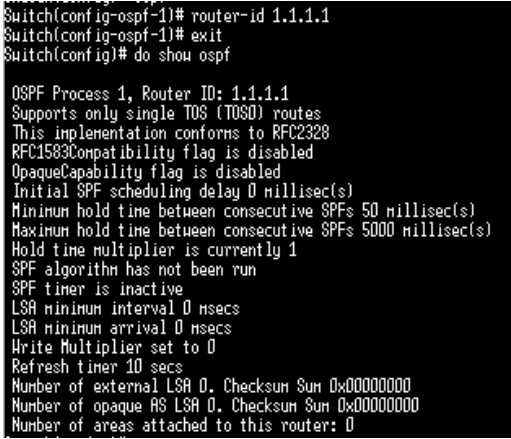
```
Switch# show erps instance 1
Erps instance           : 1
Erps ring status        :enable
Erps mel                :2
Erps control vlan       : 2
Erps WTR time           : 6 min
Erps guard time         : 100 ms
Erps work-mode          :revertive
Erps ring ID            :2
Erps ring-level         :1
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

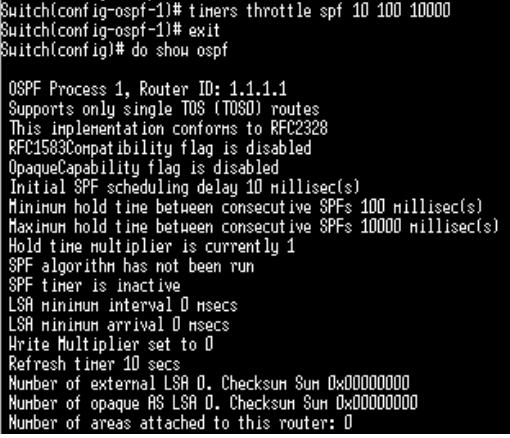
2.39.1 ospf(global)

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. <pre>Switch(config)# ospf Switch(config-ospf-1)# Switch# show ospf</pre> 

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 OSPF 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. <pre>Switch(config)# ospf Switch(config-ospf-1)# router-id 1.1.1.1 Switch# show ospf</pre>  <pre>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 millsec(s) Minimum hold time between consecutive SPF's 50 millsec(s) Maximum hold time between consecutive SPF's 5000 millsec(s) Hold time multiplier is currently 1 SPF algorithm has not been run SPF timer is inactive LSA minimum interval 0 msec LSA minimum arrival 0 msec 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</pre>	

2.39.3 timers throttle spf

Syntax	timers throttle spf <0-600000> <0-600000> <0-600000> no timers throttle spf						
Parameter	<table> <tr> <td>Delay time <0-60000></td><td>Initial SPF scheduling delay</td></tr> <tr> <td>Hold time <0-60000></td><td>Minimum hold time between consecutive SPF's</td></tr> <tr> <td>Max hold time <0-60000></td><td>Maximum hold time between consecutive SPF's</td></tr> </table>	Delay time <0-60000>	Initial SPF scheduling delay	Hold time <0-60000>	Minimum hold time between consecutive SPF's	Max hold time <0-60000>	Maximum hold time between consecutive SPF's
Delay time <0-60000>	Initial SPF scheduling delay						
Hold time <0-60000>	Minimum hold time between consecutive SPF's						
Max hold time <0-60000>	Maximum hold time between consecutive SPF's						
Default	delay time 0, hold time 50, max hold time 5000						
Mode	OSPF Process Configuration Mode						
Usage	Use the timers throttle spf 10 100 10000 command to configure OSPF 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. <pre>Switch(config)# ospf Switch(config-ospf-1)# timers throttle spf 10 100 10000 Switch# show ospf</pre>  <pre>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 millsec(s) Minimum hold time between consecutive SPF's 100 millsec(s) Maximum hold time between consecutive SPF's 10000 millsec(s) Hold time multiplier is currently 1 SPF algorithm has not been run SPF timer is inactive LSA minimum interval 0 msec LSA minimum arrival 0 msec 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</pre>						

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 OSPF 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 millsec(s)
Minimum hold time between consecutive SPF's 100 millsec(s)
Maximum hold time between consecutive SPF's 10000 millsec(s)
Hold time multiplier is currently 1
SPF algorithm has not been run
SPF timer is inactive
LSA minimum interval 0 msec
LSA minimum arrival 0 msec
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 OSPF 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 OSPF 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
```

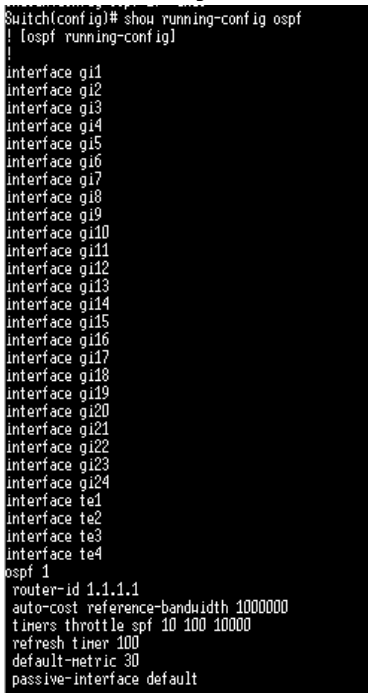
2.39.7 passive-interface vlan-interface

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
```

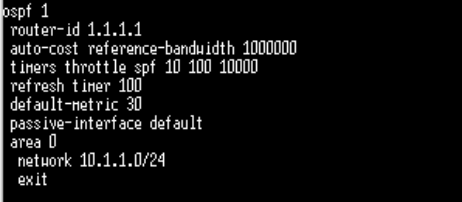
2.39.8 passive-interface default

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. <pre>Switch(config) # ospf Switch(config-ospf-1) # passive-interface default Switch(config) # do show running-config ospf</pre>  <pre>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</pre>

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. <pre>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)#</pre> Switch(config) # do show running-config ospf <pre>auto-cost reference-bandwidth 1000000 timers throttle spf 10 100 10000 refresh timer 100 default-metric 30 passive-interface default area 0 exit</pre>	

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. <pre>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</pre> 	

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 <pre>Switch(config)# ospf Switch(config-ospf-1) #area 1 Switch(config-ospf-1-area-0.0.0.1) #default-cost 10</pre>

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. <pre>Switch(config)# ospf Switch(config-ospf-1) #area 0 Switch(config-ospf-1-area-0.0.0.0) #authentication message-digest</pre> <pre>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</pre>

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 <i>ospf authentication</i> 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 authentication-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. <pre>Switch(config) # interface vlan 1 Switch(config-if-vlan1) # ospf retransmit-interval 10</pre>	

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. <pre>Switch(config) # interface vlan 1 Switch(config-if-vlan1) # ospf transmit-delay 2</pre>	

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. <pre>Switch(config) # interface vlan 1 Switch(config-if-vlan1) # ospf network point-to-point</pre>	

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. <pre>Switch(config) # interface vlan 1 Switch(config-if-vlan1) # ospf mtu-ignore</pre>	

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. <pre>Switch(config)# rip Switch(config-rip)# distance 150 Switch(config-rip)# exit</pre>	

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:
  intf0 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	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: <pre>switch(config)# router rip switch(config-rip)# network 192.168.1.88/24 switch(config-rip)# exit</pre>	

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	<table> <tr> <td>days</td><td>Port poe power supply days</td></tr> <tr> <td>hours</td><td>Port poe power supply hours</td></tr> </table>	days	Port poe power supply days	hours	Port poe power supply hours
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.
