

CERIO Corporation

CS-2424G-24P A5

**PoE CS-2000 Series - 24 Port 10/100/1000M Gigabit Web Managed
PoE+ Switch with 4 Combo Gigabit Ports
(450Watt Power)**

Command Line Interface
Managed Switch Software

Rev. 1.1

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1. AAA

aaa authentication

Syntax

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

Parameter	Description
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 Tacacs+ server to authenticate.

Radius: Use remote Radius server to authenticate.

None: Do nothing and just make user to be authenticated.

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

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

Example

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

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

This example shows how to show existing login authentication lists

```
Switch# show aaa authentication login lists  
Login List Name | Authentication Method List  
-----+-----  
                default | local  
                test1  | tacacs+ radius local
```

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

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

This example shows how to show existing enable authentication lists

```
Switch# show aaa authentication login lists  
Enable List Name | Authentication Method List  
-----+-----  
                default | enable  
                test2  | tacacs+ radius enable
```

login authentication

Syntax

login authentication *LISTNAME*
no login authentication

Parameter

LISTNAME Specify the login authentication list name to use.

Default

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

Mode

Line Configuration

Usage

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

Use no form to bind the “default” list back.

Example

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

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

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

This example shows how to show line binding lists.

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

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

enable authentication

Syntax

enable authentication *LISTNAME*
no enable authentication

Parameter

LISTNAME Specify the enable authentication list name to use.

Default

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

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
-----+-----+-----

```

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

```

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	<p>This example shows how to show line binding lists.</p> <pre>Switch# show line lists</pre> <table border="1"> <thead> <tr> <th>Line Type</th> <th>AAA Type</th> <th>List Name</th> </tr> </thead> <tbody> <tr> <td rowspan="4">console</td> <td>login</td> <td>default</td> </tr> <tr> <td>enable</td> <td>default</td> </tr> <tr> <td>exec</td> <td>default</td> </tr> <tr> <td>commands</td> <td>default</td> </tr> <tr> <td rowspan="4">telnet</td> <td>accounting-exec</td> <td>default</td> </tr> <tr> <td>login</td> <td>default</td> </tr> <tr> <td>enable</td> <td>default</td> </tr> <tr> <td>exec</td> <td>default</td> </tr> <tr> <td rowspan="4">ssh</td> <td>commands</td> <td>default</td> </tr> <tr> <td>accounting-exec</td> <td>default</td> </tr> <tr> <td>login</td> <td>default</td> </tr> <tr> <td>enable</td> <td>default</td> </tr> <tr> <td rowspan="2">http</td> <td>exec</td> <td>default</td> </tr> <tr> <td>commands</td> <td>default</td> </tr> <tr> <td rowspan="2">https</td> <td>accounting-exec</td> <td>default</td> </tr> <tr> <td>login</td> <td>default</td> </tr> </tbody> </table>	Line Type	AAA Type	List Name	console	login	default	enable	default	exec	default	commands	default	telnet	accounting-exec	default	login	default	enable	default	exec	default	ssh	commands	default	accounting-exec	default	login	default	enable	default	http	exec	default	commands	default	https	accounting-exec	default	login	default
Line Type	AAA Type	List Name																																							
console	login	default																																							
	enable	default																																							
	exec	default																																							
	commands	default																																							
telnet	accounting-exec	default																																							
	login	default																																							
	enable	default																																							
	exec	default																																							
ssh	commands	default																																							
	accounting-exec	default																																							
	login	default																																							
	enable	default																																							
http	exec	default																																							
	commands	default																																							
https	accounting-exec	default																																							
	login	default																																							

tacacs default-config

Syntax	tacacs default-config [key <i>TACACSKEY</i>] [timeout <1-30>]				
Parameter	<table border="1"> <tr> <td>key <i>TACACSKEY</i></td> <td>Specify default tacacs+ server key string</td> </tr> <tr> <td>timeout <1-30></td> <td>Specify default tacacs+ server timeout value</td> </tr> </table>	key <i>TACACSKEY</i>	Specify default tacacs+ server key string	timeout <1-30>	Specify default tacacs+ server timeout value
key <i>TACACSKEY</i>	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	<p>This example shows how modify default tacacs+ configuration</p> <pre>Switch(config)# tacacs default-config timeout 20 Switch(config)# tacacs default-config key tackey</pre> <p>This example shows how to show default tacacs+ configurations.</p> <pre>Switch# show tacacs default-config Timeout Key -----+----- 10 tackey</pre> <p>This example shows how to create a new tacacs+ server with above default config and show results.</p> <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>
----------------	---

tacacs host

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

Parameter	<table border="1" style="width: 100%;"> <tr> <td style="width: 30%;">host <i>HOSTNAME</i></td> <td>Specify tacacs+ server host name, both IP address and domain name are available.</td> </tr> <tr> <td>port <0-65535></td> <td>Specify tacacs+ server udp port</td> </tr> <tr> <td>key <i>TACPLUSKEY</i></td> <td>Specify tacacs+ server key string</td> </tr> <tr> <td>priority <0-65535></td> <td>Specify tacacs+ server priority</td> </tr> <tr> <td>timeout <1-30></td> <td>Specify tacacs+ server timeout value</td> </tr> </table>	host <i>HOSTNAME</i>	Specify tacacs+ server host name, both IP address and domain name are available.	port <0-65535>	Specify tacacs+ server udp port	key <i>TACPLUSKEY</i>	Specify tacacs+ server key string	priority <0-65535>	Specify tacacs+ server priority	timeout <1-30>	Specify tacacs+ server timeout value
host <i>HOSTNAME</i>	Specify tacacs+ server host name, both IP address and domain name are available.										
port <0-65535>	Specify tacacs+ server udp port										
key <i>TACPLUSKEY</i>	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
Prio  | Timeout |      IP Address      |  Port  |
Key
-----+-----+-----+-----+-----
---
   100 |    10   |  192.168.1.111     | 12345  |
tacacs+
```

show tacacs default-config

Syntax **show tacacs default-config**

Parameter

Default No default value for this command

Mode Privileged EXEC

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**
Timeout | Key
-----+-----
 10 | tackey

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	<p>This example shows how to show existing tacacs+ server.</p> <pre>Switch# show tacacs Prio Timeout IP Address Port Key -----+-----+-----+-----+-----+----- --- 100 10 192.168.1.111 12345 tacacs+</pre>

show default-config

Syntax	radius default-config [key <i>RADIUSKEY</i>] [retransmit <1-10>] [timeout <1-30>]						
Parameter	<table border="1"> <tr> <td>key <i>RADIUSKEY</i></td> <td>Specify default radius server key string</td> </tr> <tr> <td>retransmit <1-10></td> <td>Specify default radius server retransmit value</td> </tr> <tr> <td>timeout <1-30></td> <td>Specify default radius server timeout value</td> </tr> </table>	key <i>RADIUSKEY</i>	Specify default radius server key string	retransmit <1-10>	Specify default radius server retransmit value	timeout <1-30>	Specify default radius server timeout value
key <i>RADIUSKEY</i>	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 seconds.						
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**

```
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
  Prio |      IP Address      | Auth-Port|
Retries| Timeout| Usage-Type| Key
-----+-----+-----+-----+-----
--+-----+-----+-----+-----+-----
      1 | 192.168.1.111 | 1812     | 5 |
      20 | All | radiuskey
```

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 <i>HOSTNAME</i>	Specify radius server host name, both IP address and domain name are available.
auth-port <0-65535>	Specify radius server udp port
key <i>RADIUSKEY</i>	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	Usage type of this server
login	Use for login
802.1X	Use for 802.1X authentication
all	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
Prio | IP Address | Auth-Port | Retries |
Timeout | Usage-Type | Key
-----+-----+-----+-----+-----
+-----+-----+-----+-----+-----
 100 | 192.168.1.111 | 12345 | 5 | 10
| All | radiuskey
```

show radius default-config

Syntax

show radius default-config

Parameter

Default

No default value for this command

Mode

Privileged EXEC

Usage

Use “**show radius default-config**” command to show radius default configurations.

Example

This example shows how to show default radius configurations.

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

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	<p>This example shows how to show existing radius server.</p> <pre>Switch# show radius Prio IP Address Auth-Port Retries Timeout Usage-Type Key -----+-----+-----+-----+----- +-----+-----+-----+-----+----- 100 192.168.1.111 12345 5 10 All radiuskey</pre>

2. ACL

mac acl

Syntax	mac acl NAME no mac acl NAME
Parameter	NAME Specify the name of MAC ACL
Default	No default is defined
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	<p>The example shows how to create a mac acl. You can verify settings by the following show acl command</p> <pre>Switch334455(config)# mac acl test Switch334455(mac-al)# show acl MAC access list test</pre>

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>]
[ethype <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.
	[ethertype <0x0600-0xFFFF>]	(Optional) Specify Ethernet protocol number of packet

Default No default is defined.

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

```
Switch334455(config)# mac acl test
Switch334455(mac-al)# sequence 999 permit
22:33:44:55:66:77/FF:FF:FF:FF:FF:FF any vlan 3 ethtype 0x2800
Switch334455(mac-al)# 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
```

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>]
[ethertype <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.
[ethertype <0x0600-0xFFFF>]	(Optional) Specify Ethernet protocol number of packet
[shutdown]	(Optional) Shutdown interface while ACE hit
Default	No default is defined.
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	<p>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</p> <pre>Switch334455(config)# mac acl test Switch334455(mac-al)# sequence 30 permit any any Switch334455(mac-al)# deny any aa:bb:cc:00:00:00/FF:FF:FF:00:00:00 vlan 9 shutdown Switch334455(mac-al)# show acl MAC access list test sequence 30 permit any any sequence 50 deny any AA:BB:CC:00:00:00/FF:FF:FF:00:00:00 vlan 9 shutdown</pre>

ip acl

Syntax	ip acl NAME no ip acl NAME
Parameter	NAME Specify the name of IPv4 ACL
Default	No default is defined
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 Switch334455(config)# ip acl iptest Switch334455(ip-al)# show acl IP access list iptest

permit (IP)

Syntax

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

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

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

65535>|echo|discard|daytime|ftp-
data|ftp|telnet|smtp|time|hostname|whois|
tacacs-
ds|domain|www|pop2|pop3|syslog|talk|klogin|kshell|sunrpc|dri
p|PORT_RANGE|any)
[match-all TCP_FLAG] [(dscp|precedence) VALUE]

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

no sequence <1-2147483647>

Parameter	
<1-2147483647>	(Optional) Specify sequence index of ACE, the sequence index represent the priority of an ACE in ACL.
(A.B.C.D/A.B.C.D any)	Specify the source IPv4 address and mask of packet or any IPv4 address.
(A.B.C.D/A.B.C.D any)	Specify the destination IPv4 address and mask of packet or any IPv4 address.
[dscp VALUE]	(Optional) Specify the DSCP of packet.
[precedence VLAUE]	(Optional) Specify the IP precedence of packet.
icmp-type	Specify ICMP message type for filtering ICMP packet. Enter a type name of list or a number of ICMP message type.
icmp-code	Specify ICMP message code for filtering ICMP packet.
l4-source-port	Specify TCP/UDP source port of for filtering TCP/UDP packet. Enter a port name of list or a number of TCP/UDP port.
l4-destination-port	Specify TCP/UDP destination port of for filtering TCP/UDP packet. Enter a port name of list or a number of TCP/UDP port.
match-all	Specify tcp flag for TCP packet. If a flag should be set it is prefixed by '+' .If a flag should be unset it is prefixed by '- . Available 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 is defined.

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.
Switch334455(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.
Switch334455(ip-al)# **permit icmp any any echo-request any**

This command shows how to permit any IP address HTTP packets with DSCP 5.
Switch334455(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.
Switch334455(ip-al)# **permit udp any any 192.168.1.1/255.255.255.255 snmp**

Switch334455(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

deny (IP)

Syntax

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

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

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

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

no sequence <1-2147483647>

Parameter

<1-2147483647>	(Optional) Specify sequence index of ACE, the sequence index represent the priority of an ACE in ACL.
(A.B.C.D/A.B.C.D any)	Specify the source IPv4 address and mask of packet or any IPv4 address.
(A.B.C.D/A.B.C.D any)	Specify the destination IPv4 address and mask of packet or any IPv4 address.
[dscp VALUE]	(Optional) Specify the DSCP of

	packet.
[precedence VLAUE]	(Optional) Specify the IP precedence of packet.
icmp-type	Specify ICMP message type for filtering ICMP packet. Enter a type name of list or a number of ICMP message type.
icmp-code	Specify ICMP message code for filtering ICMP packet.
l4-source-port	Specify TCP/UDP source port of for filtering TCP/UDP packet. Enter a port name of list or a number of TCP/UDP port.
l4-destination-port	Specify TCP/UDP destination port of for filtering TCP/UDP packet. Enter a port name of list or a number of TCP/UDP port.
match-all	Specify tcp flag for TCP packet. If a flag should be set it is prefixed by "+". If a flag should be unset it is prefixed by "-". Available 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 is defined.

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

```
Switch334455(config)# ip acl iptest
Switch334455(ip-al)# deny ip 192.168.1.80/255.255.255.255 any
```

```
Switch334455(ip-al)# show acl
```

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

ipv6 acl

Syntax

```
ipv6 acl NAME
no ipv6 acl NAME
```

Parameter

NAME	Specify the name of IPv6 ACL
------	------------------------------

Default

No default is defined

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

```
Switch334455(config)#ipv6 acl ipv6test
Switch334455(ipv6-al)# show acl
IPv6 access list iptest
```

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|sys
log|
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|an
y) [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|dom
ain| bootps|bootpc|tftp|sunrpc|ntp|netbios-
ns|snmp|snmptrap|who|syslog|
talk|rip|PORT_RANGE|any) (X:X::X:X/<0-128>|any)
(<0-
65535>|echo|discard|time|nameserver|tacacs-ds|domain
| bootps|bootpc|tftp|sunrpc|ntp|netbios-ns|
snmp|snmptrap|who|syslog|PORT_RANGE|any)
[(dscp|precedence) VALUE]

no sequence <1-2147483647>

Parameter

<1-2147483647>	(Optional) Specify sequence index of ACE, the sequence index represent the priority of an ACE in ACL.
(X:X::X:X/<0-128> any)	Specify the source IPv6 address and prefix of packet or any IPv6 address.
(X:X::X:X/<0-128> any)	Specify the destination IPv6 address and prefix of packet or any IPv6 address.
[dscp VALUE]	(Optional) Specify the DSCP of packet.
[precedence VLAUE]	(Optional) Specify the IP precedence of packet.
icmp-type	Specify ICMP message type for filtering ICMP packet. Enter a type name of list or a number of ICMP message type.
icmp-code	Specify ICMP message code for filtering ICMP packet.
l4-source-port	Specify TCP/UDP source port of for filtering TCP/UDP packet. Enter a port name of list or a number of TCP/UDP port.

l4-destination-port

Specify TCP/UDP destination port of for filtering TCP/UDP packet. Enter a port name of list or a number of TCP/UDP port.

match-all Specify tcp flag for TCP packet. If a flag should be set it is prefixed by '+' and if a flag should be unset it is prefixed by '-'. Available options are +urg, +ack, +psh, +rst, +syn, +fin, -urg, -ack, -psh, -rst, -syn and -fin. To define more than 1 flag - enter additional flags one after another without a space (example +syn-ack).

Default No default is defined.

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.
Switch334455(ipv6-al)# **permit permit ipv6 fe80:1122:3344:5566::1/64 any**

```
Switch334455(ipv6-al)# show acl  
IPv6 access list ipv6test  
sequence 1 permit ipv6 fe80:1122:3344:5566::1/64 any
```

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

	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 is defined.

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

```
Switch334455(config)# ipv6 acl ipv6test
Switch334455(ip-al)# deny ipv6 any
fe80::abcd/128 Switch334455(ip-al)# show acl
```

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

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 is defined

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
interface fa1
mac acl test
```

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 is defined

Mode	Global Configuration Context Configuration
Usage	Use the show acl command to show created ACLs. You can specify mac or 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. Switch334455(config)# show ip acl IP access list iptest sequence 1 deny ip 192.168.1.80/255.255.255.255 any

show acl utilization

Syntax	show acl utilization
Parameter	None
Default	No default is defined
Mode	Global Configuration
Usage	Use the show acl utilization command to show the usage of PIE of ASIC. When an ACL bind to interface, it needs ASIC resource to help to filter packet. An ASIC has limited resource. This command help user to know the PIE usage of AISC.
Example	The example shows how to show utilization Switch(config-if)# do show acl utilization Type: sys usage: 128 Type: mac ACL usage: 128 Type: IPv4 ACL usage: 128 Type: IPv6 ACL usage: 128

3. Administration

configure

Syntax	configure
---------------	------------------

Parameter

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)#

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**

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. <pre>Switch# clear telnet</pre>

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. <pre>Switch> enable Switch# show privilege Current CLI Username:</pre>

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
```

end

Syntax

end

Parameter

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#
```

exit

Syntax

exit

Parameter

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>
```

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
Console =====
      Session Timeout : 10 (minutes)
```

```
History Count      :  
100 Password Retry  
                  :  
3  
Silent Time       : 0 (seconds)  
Telnet  
=====
```

```
Telnet Server      : disabled  
Session Timeout   : 10 (minutes)  
History Count     : 150  
Password Retry    : 3  
Silent Time       : 0 (seconds)  
SSH =====
```

```
SSH Server        : disabled  
Session Timeout   : 10 (minutes)  
History Count     : 200  
Password Retry    : 3  
Silent Time       : 0 (seconds)
```

This example shows how show history commands.

```
Switch# show history  
Maximun History Count: 100
```

```
-----  
1. enable  
2. configure  
3. line console  
4. exit  
5. show history  
6. line  
7. exit  
8. show history  
9. configure  
10. line  
11. line console  
12. exit  
13. line console  
14. history 100  
15. exit  
16. show history  
17. exit  
18. show history
```

hostname

Syntax

```
___ hostname WORD
```

Parameter

```
WORD Specify the hostname of the switch.
```

Default

Default name string is "Switch".

Mode

Global Configuration

Usage

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

Example	This example shows how to modify contact information Switch(config) # hostname myname myname(config) #
----------------	---

interface

Syntax	interface <i>IF_PORTS</i> interface range <i>IF_PORTS</i>
---------------	--

Parameter	<i>IF_PORTS</i>	Specify the port to select. This parameter allows partial port name and ignore case. For Example: fa1 FastEthernet3 Gigabit4 If port range is specified, the list format is also available. For Example: fa1,3,5 fa2,gi1-3
------------------	-----------------	--

Default	No default value for this command.
----------------	------------------------------------

Mode	Global Configuration
-------------	----------------------

Usage	Some configurations are port based. In order to configure these configurations, we need to enter Interface Configuration mode to configure them. Use “ interface ” command to enter the Interface Configuration mode and select the port to be configured.
--------------	---

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

Example	This example shows how to enter Interface Configuration mode Switch# configure Switch(config) # interface fa1 Switch(config-if) #
----------------	--

ip address

Syntax	ip address <i>A.B.C.D</i> [mask <i>A.B.C.D</i>]
---------------	---

Parameter	address <i>A.B.C.D</i> Specify IPv4 address for switch mask <i>A.B.C.D</i> Specify net mask address for switch
Default	Default IP address is 192.168.1.1 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	<p>This example shows how to modify the ipv4 address of the switch.</p> <pre>Switch(config)# ip address 192.168.1.200 mask 255.255.255.0</pre> <p>This example shows how to show current ipv4 address of the switch.</p> <pre>Switch# show ip IP Address: 192.168.1.200 Subnet Netmask: 255.255.255.0 Default Gateway: 192.168.1.254</pre>

ip default-gateway

Syntax	ip default-gateway <i>A.B.C.D</i> no ip default-gateway
Parameter	<i>A.B.C.D</i> 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	<p>This example shows how to modify the ipv4 address of the switch.</p> <pre>Switch(config)# ip default-gateway 192.168.1.100</pre> <p>This example shows how to show current ipv4 default gateway of the switch.</p> <pre>Switch# show ip IP Address: 192.168.1.1 Subnet Netmask: 255.255.255.0 Default Gateway: 192.168.1.100</pre>

ip dhcp

Syntax	ip dhcp no ip dhcp
Parameter	
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	<p>This example shows how to enable dhcp client.</p> <pre>Switch(config)# ip dhcp</pre> <p>This example shows how to show current dhcp client state of the switch.</p> <pre>Switch# show ip dhcp DHCP Status : enabled</pre>

ip dns

Syntax	ip dns A.B.C.D [A.B.C.D] no ip dns [A.B.C.D]
Parameter	<i>A.B.C.D</i> 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	<p>This example shows how to modify the DNS server of the switch.</p> <pre>Switch(config)# ip dns 111.111.111.111 222.222.222.222</pre>

This example shows current DNS server of the switch.

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

ip dns lookup

Syntax

```
ip dns lookup  
no ip dns lookup
```

Parameter

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
```

ipv6 autoconfig

Syntax

```
ipv6 autoconfig  
no ipv6 autoconfig
```

Parameter

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:fe1:4b3c/128
IPv6 static Gateway Address  : ::
IPv6 in use Address           : fe80::dcad:beff:feef:102/64
IPv6 in use Gateway Address  : ::
```

ipv6 address

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

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

Default No default ipv6 address on the switch.

Mode Global Configuration

Usage Use “**ipv6 address**” command to specify static IPv6 address.

Example This example shows how to add static ipv6 address of the switch.
Switch(config)# **ipv6 address fe80::20e:2eff:fe1:4b3c prefix 128**

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

```
Switch# show ipv6
IPv6 DHCP Configuration      : Disabled
IPv6 DHCP DUID                :
IPv6 Auto Configuration      : Enabled
IPv6 Link Local Address      : fe80::dcad:beff:feef:102/64
IPv6 static Address          : fe80::20e:2eff:fe1:4b3c/128
IPv6 static Gateway Address  : ::
IPv6 in use Address           : fe80::dcad:beff:feef:102/64
IPv6 in use Gateway Address  : ::
```

ipv6 default-gateway

Syntax	ipv6 default-gateway <i>X:X::X:X</i>
Parameter	<i>X:X::X:X</i> 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	<p>This example shows how to modify the ipv6 default gateway address of the switch.</p> <pre>Switch(config)# ipv6 default-gateway fe80::dcad:beff:feef:103</pre> <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>

ipv6 dhcp

Syntax	ipv6 dhcp no ipv6 dhcp
Parameter	
Default	Default DHCPv6 client is disabled.
Mode	Global Configuration
Usage	<p>Use “ipv6 dhcp” command to enabled dhcpv6 client to get IP address from remote DHCPv6 server.</p> <p>Use “no ipv6 dhcp” command to disabled dhcpv6 client and use static ipv6</p>

address or ipv6 auto config address.

Example

This example shows how to enable dhcp client.

```
Switch(config)# ipv6 dhcp
```

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

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

ip service

Syntax

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

Parameter

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

Default

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

Mode

Global Configuration

Usage

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

Example

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

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

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

```
Switch(config)# ip https
```

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

ip session-timeout

Syntax `ip (http | https) session-timeout <0-86400>`

Parameter	http	Specify session timeout for http service.
	https	Specify session timeout for https service.
	<0-86400>	Specify session timeout minutes. 0 means never timeout.

Default Default session timeout for http and https is 10 minutes.

Mode Global Configuration

Usage Use “**ip session-timeout**” command to specify the session timeout value for http or https service. When user login into WEBUI and do not do any action after session timeout will be logged out.

Example This example shows how to change http session timeout to 15min and https session timeout to 20min

```
Switch(config)# ip http session-timeout 15
Switch(config)# ip https session-timeout 20
```

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

```
Switch# show ip http
    HTTPS daemon : enabled
    Session Timeout : 15 (minutes)
Switch# show ip https
    HTTPS daemon : disabled
    Session Timeout : 20 (minutes)
```

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
  File Name           File Size           Modified
  -----
  startup-config      1913                2000-01-01 08:29:10
  rsa1                976                 2000-01-05 23:28:38
  ssl_cert            875                 2000-01-05 23:03:20
  image0 (active)    4856825             2014-04-02 15:17:34
```

```
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
  File Name           File Size           Modified
  -----
  startup-config      1913                2000-01-01 08:29:10
  rsa1                976                 2000-01-05 23:28:38
  rsa2                1675                2000-01-05 23:34:43
  dsa2                668                 2000-01-05 23:34:58
  ssl_cert            875                 2000-01-05 23:03:20
  image0 (active)    4856825             2014-04-02 15:17:34
```

line

Syntax line (console | telnet | ssh)

Parameter	Description
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	<p>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.</p> <p>In Line Configuration mode, the prompt will show as “Switch(config-line)#”</p>
Example	<p>This example shows how to enter Interface Configuration mode</p> <pre>Switch# configure Switch(config)# line console Switch(config-line)#</pre>

reboot

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

enable password

Syntax	enable [privilege <1-15>] (password <i>UNENCRYPY-PASSWORD</i> secret <i>UNENCRYPY-PASSWORD</i> secret encrypted <i>ENCRYPT-PASSWORD</i>) 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 <i>UNENCRYPY-</i>	Specify password string and make it not encrypted.

PASSWORD

secret Specify password string and make it encrypted.
UNENCRYPT-
PASSWORD

secret encrypted 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).
ENCRYPT-
PASSWORD

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**

exec-timeout

Syntax **exec-timeout** <0-65535>

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

Default Default session timeout for all lines are 10 minutes.

Mode Line Configuration

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

Example

This example shows how to change console session timeout to 15min ,telnet session timeout to 20min and ssh session timeout to 25min.
Switch(config)# **line console**

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

This example shows how show line information.

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

password-thresh

Syntax

password-thresh <0-120>

Parameter

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

Default

Default password fail retry number is 3.

Mode

Line Configuration

Usage

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

Example

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

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

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

This example shows how show line information.

```
Switch# show line
Console =====
  Session Timeout : 10
  (minutes) History Count :
  128
  Password Retry : 4
  Silent Time : 0 (seconds)
Telnet
=====
  Telnet Server : disabled
  Session Timeout : 10
  (minutes) History Count :
  128
  Password Retry : 5
  Silent Time : 0 (seconds)
SSH =====
  SSH Server : disabled
  Session Timeout : 10
  (minutes) History Count :
  128
  Password Retry : 6
  Silent Time : 0 (seconds)
```

ping

Syntax

ping *HOSTNAME* [**count** <1-999999999>]

Parameter

<i>HOSTNAME</i>	Specify IPv4/IPv6 address or domain name to ping.
count <1-999999999>	Specify how many times to ping.

Default

No default value for this command.

Mode

User EXEC
Privileged EXEC

Usage

Use “**ping**” command to do network ping diagnostic.

Example

This example shows how to ping remote host 192.168.1.111.

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

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

traceroute

Syntax	<code>traceroute A.B.C.D [max_hop <2-255>]</code>				
Parameter	<table><tr><td><code>A.B.C.D</code></td><td>Specify IPv4 to trace.</td></tr><tr><td><code>max_hop <2-255></code></td><td>Specify maximum hop to trace.</td></tr></table>	<code>A.B.C.D</code>	Specify IPv4 to trace.	<code>max_hop <2-255></code>	Specify maximum hop to trace.
<code>A.B.C.D</code>	Specify IPv4 to trace.				
<code>max_hop <2-255></code>	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	<pre>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</pre>				

show arp

Syntax	<code>show arp</code>
Parameter	
Default	No default value for this command.
Mode	User EXEC Privileged EXEC
Usage	Use “ show arp ” command to show all arp entries.
Example	<pre>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</pre>

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	<p>This example shows how to show current CPU utilization.</p> <pre>Switch# show cpu utilization CPU utilization ----- Current: 30%</pre>

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

This example shows how show history commands.

```
Switch# show history
```

```
Maximun History Count: 100
```

-
1. enable
 2. configure
 3. line console
-

```
4. exit
5. show history
6. line
7. exit
8. show history
9. configure
10. line
11. line console
12. exit
13. line console
14. history 100
15. exit
16. show history
17. exit
18. show history
```

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

This example shows how to show system version.

```
Switch# show info
System Name       : Switch
System Location   : Default Location
System Contact    : Default Contact
MAC Address       : DE:AD:BE:EF:01:02
IP Address        : 192.168.1.1
Subnet Mask       : 255.255.255.0
Loader Version    : 1.3.0.26225
Loader Date       : Thu May 17 15:19:42 CST 2012
Firmware Version  : 2.5.0-beta.32811
Firmware Date     : Mon Sep 24 19:33:42 CST 2012
System Object ID  : 1.3.6.1.4.1.27282.3.2.10
System Up Time    : 0 days, 1 hours, 49 mins, 29 secs
```

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	<hr/> <p>This example shows how to show current ipv4 address of the switch.</p> <pre>Switch# show ip IP Address: 192.168.1.200 Subnet Netmask: 255.255.255.0 Default Gateway: 192.168.1.254</pre> <hr/>

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	<hr/> <p>This example shows how to show current dhcp client state of the switch.</p> <pre>Switch# show ip dhcp DHCP Status : enabled</pre> <hr/>

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	<hr/> <p>This example shows how to show current ipv4 address of the switch.</p> <pre>Switch# show ip dns DNS lookup is enabled DNS Server 1 : 168.95.1.1 DNS Server 2 : 168.95.192.1</pre> <hr/>

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	<hr/> <p>This example shows how to show current ipv4 address of the switch.</p> <pre>Switch# show ip http HTTP daemon : enabled Session Timeout : 10 (minutes) Switch# show ip https HTTPS daemon : enabled Session Timeout : 10 (minutes)</pre> <hr/>

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	<p>This example shows how to show current ipv6 address of the switch.</p> <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:feef:14b3c/128 IPv6 static Gateway Address : :: IPv6 in use Address : fe80::dcad:beff:feef:102/64 IPv6 in use Gateway Address : ::</pre>

show ipv6 dhcp

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

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 : 15 (minutes)
  History Count   : 128
  Password Retry  : 3
  Silent Time     : 0 (seconds)
Telnet =====
  Telnet Server   : disabled
  Session Timeout : 20 (minutes)
  History Count   : 128
  Password Retry  : 3
  Silent Time     : 0 (seconds)
SSH =====
  SSH Server      : disabled
  Session Timeout : 25 (minutes)
  History Count   : 128
  Password Retry  : 3
  Silent Time     : 0 (seconds)
```

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:                62408          56424          5984              0          1320          19328
-/+ buffers/cache:      35776          26632
Swap:                 0           0           0
```

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 arp entries.

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

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 existing user accounts.

```
Switch# show username
```

Priv	Type	User Name	Password
01	secret		dnXencJRwflV6
15	secret	admin	FzjrGO6vfbERY
15	secret	test	7p57T9yMkViSUS

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
admin	telnet	192.168.1.111
admin	ssh	192.168.1.111

show version

Syntax **show version**

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	<p>This example shows how to show system version.</p> <pre>Switch# show version Loader Version : 1.3.0.26225 Loader Date : Thu May 17 15:19:42 CST 2012 Firmware Version : 2.5.0-beta.32811 Firmware Date : Mon Sep 24 19:33:42 CST 2012</pre>

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	<p>This example shows how to change console silent time to 10, telnet silent time to 15 and ssh silent time to 20.</p> <pre>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</pre> <p>This example shows how show line information.</p> <pre>Switch# show line Console ===== Session Timeout : 10 (minutes)</pre>

ssl

```

History Count      :
128 Password Retry
                  :
3
Silent Time       : 10 (seconds)
Telnet
=====
Telnet Server     : disabled
Session Timeout  : 10
(minutes) History Count :
128
Password Retry   : 3
Silent Time      : 15 (seconds)
SSH
=====
SSH Server        : disabled
Session Timeout  : 10
(minutes) History Count :
128
Password Retry   : 3
Silent Time      : 20 (seconds)

```

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	1191	2000-01-01 00:00:23
backup-config	1607	2000-01-01 08:36:23
rsa1	974	2000-01-01 00:00:18
rsa2	1675	2000-01-01 00:00:18
dsa2	668	2000-01-01 00:00:18
ssl_cert	993	2000-01-01 00:00:18
image0 (active)	4372401	2012-09-24 01:57:29
image1 (backup)	0	

system name

Syntax

system name *NAME*

Parameter	<i>NAME</i> 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	<p>This example shows how to modify contact information</p> <pre>Switch(config)# system name myname myname(config)#</pre> <p>This example shows how to show system name information</p> <pre>Switch# show info System Name : myname System Location : Default Location System Contact : Default Contact MAC Address : DE:AD:BE:EF:01:02 IP Address : 192.168.1.1 Subnet Mask : 255.255.255.0 Loader Version : 1.3.0.26225 Loader Date : Thu May 17 15:19:42 CST 2012 Firmware Version : 2.5.0-beta.32811 Firmware Date : Mon Sep 24 19:33:42 CST 2012 System Object ID : 1.3.6.1.4.1.27282.3.2.10 System Up Time : 0 days, 0 hours, 2 mins, 37 secs</pre>

system contact

Syntax	system contact <i>CONTACT</i>
Parameter	<i>CONTACT</i> 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 callme**

This example shows how to show system contact information

```
Switch# show info  
System Name      : Switch  
System Location  : Default Location  
System Contact   : callme  
MAC Address      : DE:AD:BE:EF:01:02  
IP Address       : 192.168.1.1  
Subnet Mask      : 255.255.255.0  
Loader Version   : 1.3.0.26225  
Loader Date      : Thu May 17 15:19:42 CST 2012  
Firmware Version : 2.5.0-beta.32811  
Firmware Date    : Mon Sep 24 19:33:42 CST 2012  
System Object ID : 1.3.6.1.4.1.27282.3.2.10  
System Up Time   : 0 days, 0 hours, 2 mins, 37 secs
```

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

```
Switch# show info  
System Name      : SwitchEF0102  
System Location  : home  
System Contact   : Default Contact  
MAC Address      : DE:AD:BE:EF:01:02  
IP Address       : 192.168.1.1  
Subnet Mask      : 255.255.255.0  
Loader Version   : 1.3.0.26225  
Loader Date      : Thu May 17 15:19:42 CST 2012  
Firmware Version : 2.5.0-beta.32811  
Firmware Date    : Mon Sep 24 19:33:42 CST 2012  
System Object ID : 1.3.6.1.4.1.27282.3.2.10  
System Up Time   : 0 days, 0 hours, 2 mins, 37 secs
```

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. Switch# terminal length 3 Switch# show running-config SYSTEM CONFIG FILE ::= BEGIN ! System Description: RTK RTL8380-24FE-4GEC Switch ! System Version: v3.0.4.46766 --More--

username

Syntax	username <i>WORD</i> <0-32> [privilege (admin user <0-15>)] (nopassword password <i>UNENCRYPY-PASSWORD</i> secret <i>UNENCRYPY-PASSWORD</i> secret encrypted <i>ENCRYPT-PASSWORD</i>)
	no username <i>WORD</i> <0-32>
Parameter	username <i>WORD</i> <0-32> Specify user name to add/delete/edit.
	privilege admin Specify privilege level to be admin (privilege 15)
	privilege user Specify privilege level to be user (privilege 1)
	privilege <0-15> Specify custom privilege level
	password <i>UNENCRYPY-PASSWORD</i> Specify password string and make it not encrypted.
	secret <i>UNENCRYPY-PASSWORD</i> Specify password string and make it encrypted.
	secret encrypted <i>ENCRYPT-PASSWORD</i> 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.

Switch# **show username**

Priv	Type	User Name	Password
01	secret		dnXencJRwflV6
15	secret	admin	FzjrGO6vfbERY
15	secret	test	7p57T9yMkViSUS

4. Authentication Manager

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.
Switch(config)# **authentication dot1x**

```
Switch(config)# authentication mac
Switch(config)# authentication web
Switch# show authentication
Authentication dot1x state      :
enabled Authentication mac state:
enabled Authentication web state:
enabled
Guest VLAN                      : enabled (3)
Mac-auth Radius User ID Format:
XXXXXXXXXXXXXXXXX
.....
```

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

Example

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

```
Switch(config)# interface fa1
Switch(config-if)# authentication dot1x
Switch(config-if)# authentication mac
Switch(config-if)# authentication web
Switch# show authentication interface fa1
Interface FastEthernet1
  Admin Control      : disable
  Host Mode          : multi-auth
  Type dot1x State   : enabled
  Type mac State     : enabled
  Type web State     : enabled
.....
```

authentication mac radius

Syntax

authentication mac radius [mac-case (lower|upper)] [mac-delimiter

(colon|dot|hyphen|none) [gap (2|4|6)]

Parameter	<p>mac-case (lower upper) Select radius user id to be upper case or lower case.</p> <p>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: XXXXXXXXXXXXX</p> <p>gap (2 4 6) Select delimiter gap 2: XX-XX-XX-XX-XX-XX 4: XXXX-XXXX-XXXX 6: XXXXXX-XXXXXX</p>
------------------	--

Default Default radius id format is upper case with none delimiter.

Mode Global Configuration

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

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

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

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	<p><i>mac-addr</i> MAC Authentication local MAC address</p> <p>control auth Host with this MAC address will be authorized</p>
------------------	--

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

Default Default is no local MAC Authentication entry.

Mode Global Configuration

Usage Use “**authentication mac local**” command to add local MAC authentication hosts in database. This local host database is used when MAC authentication method is configured as “local”. The MAC authentication module will find host in this local database and authenticated it. Use the **no** form of this command to delete local host from database.

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

```
Switch(config)# authentication mac local 00:11:22:33:00:01
control auth vlan 3 reauth-period 500 inactive-timeout 300
Switch# show authentication
.....
Mac-auth Local Entry          :
MAC Address                   Control      VLAN      Reauth      Inactive
-----
00:11:22:33:00:01    Authorized    3         500         300
.....
```

authentication guest-vlan

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

Parameter <1-4094> Guest VLAN ID

Default Default guest VLAN is disabled

Mode Global Configuration

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

Example The following example shows how to create guest VLAN.

```
Switch(config)# vlan 3  
Switch(config-vlan)# exit  
Switch(config)# authentication guest-vlan 3  
Switch# show authentication  
Authentication dot1x state      : enabled  
Authentication mac state       : disabled  
Authentication web state       : disabled  
Guest VLAN                      : enabled (3)  
Mac-auth Radius User ID Format: XXXXXXXXXXXXX
```

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 fa1  
Switch(config-if)# authentication guest-vlan
```

authentication host-mode

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

Parameter **multi-auth** Multiple Authentication Mode. In this

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

Default Default is multi-auth mode.

Mode Interface Configuration

Usage Use “**authentication host-mode**” command to configure the port authentication host mode.
Use the **no** form of this command to restore default value.

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

```
Switch(config)# interface fa1
Switch(config-if)# authentication host-mode multi-host
Switch# show authentication interface fa1
Interface FastEthernet1
  Admin Control           : auto
  Host Mode               : multi-host
  Type dot1x State       : disabled
  Type mac State          : disabled
  Type web State          : disabled
.....
```

authentication max-hosts

Syntax **authentication max-hosts** <1-256>
no authentication max-hosts

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

Default Default max host number is 256

Mode Interface Configuration

Usage Use “**authentication max-hosts**” command to configure the port max hosts number for multi-auth mode. The host exceed the max host number is not allowed to create authentication session and do authenticating. Use **no** form of this command to restore default value.

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

```
Switch(config)# interface fal
Switch(config-if)# authentication max-hosts 100
Switch# show mac-auth interface fal
Interface FastEthernet1
  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
.....
```

authentication method

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

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

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

Mode Interface Configuration

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

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

```
Switch(config)# interface fal
Switch(config-if)# authentication method local radius
Switch# show authentication interface fal
Interface FastEthernet1
  Admin Control           : auto
  Host Mode                : multi-host
  Type dot1x State       : disabled
  Type mac State          : disabled
  Type web State          : disabled
```

```
Type Order           : dot1x mac
web MAC/WEB Method Order : local
radius
```

authentication order

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

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

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

Mode Interface Configuration

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

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

```
Switch(config)# interface fa1
Switch(config-if)# authentication order dot1x mac web
Switch# show authentication interface fa1
Interface FastEthernet1
  Admin Control           : auto
  Host Mode               : multi-host
  Type dot1x State       : disabled
  Type mac State         : disabled
  Type web State         : disabled
  Type Order              : dot1x mac web
```

authentication port-control

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

Parameter	auto	force-auth
	Need passing authentication procedure to get network accessibility	Port is force authorized and all clients have network accessibility.

force-unauth

Port is force unauthorized and all clients

have no network accessibility.

Default

Default is disabled.

Mode

Interface Configuration

Usage

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

Example

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

```
Switch(config)# interface fa1
Switch(config-if)# authentication port-control auto
Switch# show authentication interface fa1
Interface FastEthernet1
  Admin Control           : auto
  Host Mode               : multi-auth
  Type dot1x State       : disabled
  Type mac State          : disabled
  Type web State          : disabled
.....
```

authentication radius-attributes vlan

Syntax

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

Parameter

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

Default

Default radius attributes VLAN assign mode is static.

Mode

Interface Configuration

Usage

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

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

```
Switch(config)# interface fa1
Switch(config-if)# authentication radius-attributes vlan
reject
Switch# show authentication interface fa1
Interface FastEthernet1
  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              : 256
  VLAN Assign Mode      : reject
.....
```

authentication reauth

Syntax **authentication reauth**
no authentication reauth

Parameter

Default Default is disabled.

Mode Interface Configuration

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

Example The following example shows how to enable port reauthentication.

```
Switch(config)# interface fa1
Switch(config-if)# authentication reauth
Switch# show authentication interface fa1
Interface FastEthernet1
  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      : enabled
.....
```

authentication timer inactive

Syntax	authentication timer inactive <60-65535> no authentication timer inactive
Parameter	<60-65535> Interval in seconds after which if there is no activity from the client then it will be unauthorized
Default	Default inactive timeout is 60 seconds.
Mode	Interface Configuration
Usage	Use “ authentication timer inactive ” command to configure the port inactive timeout value. Sometimes, we may assign a long aging time for a host, but in fact, it is not active. This inactive timeout will detect the host is active or not. If the host is inactive exceed this timeout, it should be removed. Use no form of this command to restore default value.
Example	The following example shows how to configure port inactive period. Switch(config)# interface fal Switch(config-if)# authentication timer inactive 300 Switch# show authentication interface fal Interface FastEthernet1 Common Timers Reauthenticate Period: 300 Inactive Timeout : 300 Quiet Period : 60 802.1x Parameters EAP Max Request : 2 EAP TX Period : 30 Supplicant Timeout : 30 Server Timeout : 30 Web-auth Parameters Login Attempt : 3

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	<p>Use “authentication timer quiet” command to configure the port quiet period value.</p> <p>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.</p> <p>Use no form of this command to restore default value.</p>
Example	<p>The following example shows how to configure port quiet period.</p> <pre>Switch(config)# interface fa1 Switch(config-if)# authentication timer quiet 300 Switch# show authentication interface fa1 Interface FastEthernet1 Common Timers Reauthenticate Period: 300 Inactive Timeout : 300 Quiet Period : 300 802.1x Parameters EAP Max Request : 2 EAP TX Period : 30 Supplicant Timeout : 30 Server Timeout : 30 Web-auth Parameters Login Attempt : 3</pre>

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	<p>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</p>

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 fa1
Switch(config-if)# authentication timer reauth 300
Switch# show authentication interface fa1 Interface
FastEthernet1
.....
Common Timers
  Reauthenticate Period: 300
  Inactive Timeout      : 60
  Quiet Period         : 60
802.1x Parameters
  EAP Max Request      : 2
  EAP TX Period       : 30
  Supplicant Timeout   : 30
  Server Timeout      : 30
Web-auth Parameters
  Login Attempt       : 3
```

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

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

Default

Default is no local authentication entry.

Mode

Global Configuration

Usage

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

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

Example

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

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

```
.....
Web-auth Local Entry          :
User Name                      VLAN      Reauth   Inactive
-----
acct1                          3        301     61
.....
```

authentication web max-login-attempts

Syntax

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

Parameter

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

Default

Default max login attempt number is 3.

Mode

Interface Configuration

Usage

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

Example

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

```
Switch(config)# interface fa1
Switch(config-if)# authentication web max-login-attempts 5
Switch# show authentication interface fa1
```

```
Interface FastEthernet1
.....
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       : 150
Web-auth Parameters
```

Login Attempt : 5

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 <i>IF_PORTS</i>		Clear sessions on specific interface
mac <i>mac-addr</i>		Clear session with specific MAC address
session-id <i>WORD</i>		Clear session with specific session ID
type (dot1x mac web)		Clear session with specific authentication type

Default Default is no local authentication entry.

Mode Privileged EXEC

Usage Use “clear authentication sessions” command to delete existing authentication sessions. If no parameter is specified, all sessions will be deleted.
After authentication session is deleted, host need to do authentication procedure again.

Example The following example shows how to clear all authentication sessions.

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

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	<p>The following example shows how to enable 802.1x authentication.</p> <pre>Switch(config)# dot1x Switch# show authentication Authentication dot1x state : enabled Authentication mac state : disabled Authentication web state : disabled Guest VLAN : enabled (3) Mac-auth Radius User ID Format: XXXXXXXXXXXXX </pre>

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	<p>The following example shows how to create guest VLAN.</p> <pre>Switch(config)# vlan 3 Switch(config-vlan)# exit Switch(config)# dot1x guest-vlan 3 Switch# show authentication Authentication dot1x state : enabled Authentication mac state : disabled Authentication web state : disabled Guest VLAN : enabled (3) Mac-auth Radius User ID Format: XXXXXXXXXXXXX</pre>

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	<p>The following example shows how to configure port 802.1x EAP TX period.</p> <pre>Switch(config)# interface fa1 Switch(config-if)# dot1x max-req 1 Switch# show authentication interface fa1 Interface FastEthernet1 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 : 150 Web-auth Parameters Login Attempt : 3</pre>

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	force-auth	Port is force authorized and all clients have network accessibility.
force-unauth	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	<p>The following example shows how to configure port control to auto mode.</p> <pre>Switch(config)# interface fa1 Switch(config-if)# dot1x port-control auto Switch# show authentication interface fa1 Interface FastEthernet1 Admin Control : auto Host Mode : multi-auth Type dot1x State : enabled Type mac State : disabled Type web State : disabled</pre>	

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	<p>The following example shows how to enable port reauthentication.</p> <pre>Switch(config)# interface fa1 Switch(config-if)# dot1x reauth Switch# show authentication interface fa1 Interface FastEthernet1 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 : enabled</pre>
----------------	--

dot1x timeout reauth-period

Syntax	<pre>dot1x timeout reauth-period <300-4294967294> no dot1x timeout reauth-period</pre>		
Parameter	<table border="1"> <tr> <td><300-4294967294></td> <td>Time in seconds after which an automatic re-authentication should be initiated</td> </tr> </table>	<300-4294967294>	Time in seconds after which an automatic re-authentication should be initiated
<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	<p>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.</p> <p>Use no form of this command to restore default value.</p>		
Example	<p>The following example shows how to configure port 802.1x reauthentication period.</p> <pre>Switch(config)# interface fa1 Switch(config-if)# dot1x timeout reauth-period 300 Switch# show authentication interface fa1 Interface FastEthernet1 Common Timers Reauthenticate Period: 300 Inactive Timeout : 60 Quiet Period : 60</pre>		

```

802.1x Parameters
  EAP Max Request      : 2
  EAP TX Period       : 30
  Supplicant Timeout  : 30
  Server Timeout      : 30
Web-auth Parameters
  Login Attempt       : 3
  
```

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 fa1
Switch(config-if)# dot1x timeout quiet-period 300
Switch# show authentication interface fa1 Interface
FastEthernet1
.....
Common Timers
  Reauthenticate Period: 300
  Inactive Timeout : 300 Quiet
  Period : 300
802.1x Parameters
  EAP Max Request      : 2
  EAP TX Period       : 30
  Supplicant Timeout  : 30
  Server Timeout      : 30
Web-auth Parameters
  Login Attempt       : 3
  
```

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	<p>The following example shows how to configure port 802.1x server timeout.</p> <pre>Switch(config)# interface fa1 Switch(config-if)# dot1x timeout supp-timeout 150 Switch# show authentication interface fa1 Interface FastEthernet1 Common Timers Reauthenticate Period: 300 Inactive Timeout : 300 Quiet Period : 300 802.1x Parameters EAP Max Request : 2 EAP TX Period : 30 Supplicant Timeout : 120 Server Timeout : 150 Web-auth Parameters Login Attempt : 3</pre>	

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	<p>The following example shows how to configure port 802.1x supplicant timeout.</p> <pre>Switch(config)# interface fa1 Switch(config-if)# dot1x timeout supp-timeout 120 Switch# show authentication interface fa1 Interface FastEthernet1 Common Timers Reauthenticate Period: 300 Inactive Timeout : 300 Quiet Period : 300 802.1x Parameters EAP Max Request : 2 EAP TX Period : 30 Supplicant Timeout : 120 Server Timeout : 30 Web-auth Parameters Login Attempt : 3</pre>

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	<p>The following example shows how to configure port 802.1x EAP TX period.</p> <pre>Switch(config)# interface fa1 Switch(config-if)# dot1x timeout tx-period 10</pre>

```
Switch# show authentication interface fal
Interface FastEthernet1
.....
Common Timers
  Reauthenticate Period:
  300 Inactive Timeout :
  300 Quiet Period : 300
802.1x Parameters
  EAP Max Request      : 2
  EAP TX Period        :
  10 Supplicant Timeout:
  120 Server Timeout   :
  150
Web-auth Parameters
  Login Attempt        : 3
```

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 fa1.

```
Switch# show authentication Authentication
dot1x state           : enabled
Authentication mac state : disabled
Authentication web state : disabled
Guest VLAN           : disabled
Mac-auth Radius User ID Format: XXXXXXXXXXXXX

Mac-auth Local Entry      :
MAC Address              Control          VLAN    Reauth    Inactive
-----
00:11:22:33:44:55      Authorized          3      30000     123

Web-auth Local Entry      :
User Name                VLAN    Reauth    Inactive
-----
acctl                    5      12345     333
```

```
Interface
Configurations

Interface

FastEthernet1
  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          : 256
  VLAN Assign Mode   :
  static Common Timers
    Reauthenticate Period:
    3600 Inactive Timeout:
    60
    Quiet Period        :
  60 802.1x Parameters
    EAP Max Request     : 2
    EAP TX Period      : 30
    Supplicant Timeout  :
    30 Server Timeout  : 30
  Web-auth Parameters
    Login Attempt      : 3
```

```
Switch# show authentication interface fa7
Interface Configurations
```

```
Interface
FastEthernet7 Admin
Control      :
auto
Host Mode   :
multi-auth Type dot1x State
              : enabled
Type mac State : disabled
Type web State : disabled
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 Inactive Timeout
  60
  Quiet Period        60
802.1x Parameters
  EAP Max Request     2
  EAP TX Period       30
  Supplicant Timeout  30
  Server Timeout      :
65535 Web-auth
Parameters
  Login Attempt      : 3
```

show authentication sessions

Syntax	show authentication sessions [detail] show authentication sessions interface <i>IF_PORTS</i> show authentication sessions session-id <i>WORD</i> show authentication session type (dot1x mac web)
---------------	--

Parameter	detail Show session detail information.
	interface Show session detail information of specific

	<i>IF_PORTS</i>	port
	session-id <i>WORD</i>	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	<p>This example shows how to show current authentication session brief and detail information.</p> <pre>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</pre>	

5. Diagnostic

show cable-diag

Syntax	show cable-diag interfaces <i>IF_NMLPORTS</i>	
Parameter	interfaces <i>IF_NMLPORTS</i>	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	<p>The following example shows the result of cable diagnostic for the interface fa1 and fa2.</p> <pre>Switch# show cable-diag interfaces fa1-2 Port Speed Local pair Pair length Pair status -----+-----+-----+-----+----- fa1 auto Pair A 0.88 Open Pair B 0.82 Open Pair C 0.80 Open Pair D 0.78 Open fa2 auto Pair A 0.81 Open Pair B 0.81 Open Pair C 0.77 Open Pair D 0.81 Open</pre>
----------------	--

show fiber-transceiver

Syntax	show fiber-transceiver interfaces <i>IF_NMLPORTS</i>				
Parameter	<table border="1" style="width: 100%;"> <tr> <td style="width: 30%;">interfaces</td> <td>Display the diagnostic information of the fiber transceiver for an interface ID or a list of interface IDs.</td> </tr> <tr> <td><i>IF_NMLPORTS</i></td> <td></td> </tr> </table>	interfaces	Display the diagnostic information of the fiber transceiver for an interface ID or a list of interface IDs.	<i>IF_NMLPORTS</i>	
interfaces	Display the diagnostic information of the fiber transceiver for an interface ID or a list of interface IDs.				
<i>IF_NMLPORTS</i>					
Default	N/A				
Mode	Privileged EXEC				
Usage	To show the diagnostic information of the fiber transceiver use the command show fiber-transceiver in the Privileged EXEC mode.				

Example The following example shows the diagnostic information for the interface gi1 and gi2, wherer the int fiber media ports with the transceiver inserted.

```
Switch# show fiber-transceiver interfaces gi1-2
Port      | Temperature | Voltage      | Current      | Output power | Input power |
          | [C]         | [Volt]       | [mA]         | [mWatt]      | [mWatt]     |
=====
gi1       | N/S        | N/S         | N/S          | N/S          | Insert     |
gi2       | N/S        | N/S         | N/S          | N/S          | Insert     |
```

Temp - Internally measured transceiver
 temperature Voltage - Internally measured supply voltage
 Current - Measured TX bias current
 Output Power - Measured TX output power in milliWatts
 Input Power - Measured RX received power in milliWatts
 OE-Present - SFP Presetn or Not Present
 LOS - Loss of signal
 N/A - Not Available, N/S - Not Supported, W - Warning, E - Error

6. DHCP Snooping

ip dhcp snooping

Syntax	ip dhcp snooping no ip dhcp snooping
Parameter	None
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>switch(config)# ip dhcp snooping switch(config)# ip dhcp snooping vlan 1 switch(config)# show ip dhcp snooping DHCP Snooping : enabled Enable on following Vlans 1 circuit-id default format : vlan-port remote-id : 00:11:22:33:44:55 (Switch Mac in Byte Order)</pre>

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	<p>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.</p> <pre>switch(config)# vlan 1-100 switch(config)# exit switch(config)# ip dhcp snooping switch(config)# ip dhcp snooping vlan 1-100 switch(config)# show ip dhcp snooping DHCP Snooping : enabled Enable on following Vlans : 1-100 circuit-id default format : vlan-port remote-id: 00:11:22:33:44:55 (Switch Mac in Byte Order) switch(config)# no ip dhcp snooping vlan 30-40 switch(config)# show ip dhcp snooping DHCP Snooping : enabled Enable on following Vlans : 1-29,41-100 circuit-id default format : vlan-port remote-id : 00:11:22:33:44:55 (Switch Mac in Byte Order)</pre>

ip dhcp snooping trust

Syntax	ip dhcp snooping trust no ip dhcp snooping trust
Parameter	None
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.

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

ip dhcp snooping verify

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

Parameter None

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.

```
switch(config)# interface gi1
switch(config-if)# ip dhcp snooping verify mac-address
switch(config-if)# do show ip dhcp snooping interface gi1
Interfaces | Trust State | Rate (pps) | hwaddr Check | Insert Option82 |
-----+-----+-----+-----+-----+
gi1 | Untrusted | None | disabled | disabled |
```

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	<p>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.</p> <pre> switch(config)# interface gi1 switch(config-if)# ip dhcp snooping rate-limit 30 switch(config-if)# do show ip dhcp snooping interfaces gi1 Interfaces Trust State Rate (pps) hwaddr Check Insert Option82 -----+-----+-----+-----+-----+ gi1 Untrusted 30 disabled disabled </pre>

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.

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

show ip dhcp snooping

Syntax	<code>show ip dhcp snooping</code>
Parameter	None
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>switch(config)# show ip dhcp snooping DHCP Snooping : enabled Enable on following Vlans : 1 circuit-id default format: vlan-port remote-id: : 00:11:22:33:44:55 (Switch Mac in Byte Order)</pre>

show ip dhcp snooping interface

Syntax	<code>show ip dhcp snooping interfaces IF_PORTS</code> <code>show ip dhcp snooping interfaces IF_PORTS statistics</code>
Parameter	<code>IF_PORTS</code> 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 gi1.

```
switch# show ip dhcp snooping interface gi1
Interfaces | Trust State | Rate (pps) | hwaddr Check | Insert Option82 |
-----+-----+-----+-----+-----+
gi1 | Untrusted | None | enabled | disabled |
```

The example shows how to show statistics of interface gi1.

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

show ip dhcp snooping binding

Syntax **show ip dhcp snooping binding**

Parameter None

Default No default is defined

Mode Privileged EXEC

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

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

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

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	<p>The example shows how to enable option82 insertion. You can verify settings by the following show ip dhcp snooping interface command.</p> <pre>switch(config)# interface gi1 switch(config-if)# ip dhcp snooping option switch(config-if)# do show ip dhcp snooping interfaces gi1 Interfaces Trust State Rate (pps) hwaddr Check Insert Option82 -----+-----+-----+-----+-----+ gi1 Untrusted None disabled enabled </pre>

ip dhcp snooping option action

Syntax	ip dhcp snooping option action (drop keep replace) no ip dhcp snooping option action						
Parameter	<table border="1"> <tr> <td>Drop</td> <td>Drop packets with option82 that are received from un trusted port</td> </tr> <tr> <td>Keep</td> <td>Keep original option82 content in packet</td> </tr> <tr> <td>Replace</td> <td>Replace option82 content by switch setting</td> </tr> </table>	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
Drop	Drop packets with option82 that are received from un trusted port						
Keep	Keep original option82 content in packet						
Replace	Replace option82 content by switch setting						
Default	DHCP snooping option82 is drop						
Mode	Interface Configuration						
Usage	Use the ip dhcp snooping option action command to set the action when receive packets that with option82 content. Use the no form of this command to default setting.						
Example	The example shows how to set action to replace option82 content. You can verify settings by the following show running-config command.						


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

ip dhcp snooping option circuit-id

Syntax

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

Parameter

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

Default

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

Mode

Interface Configuration

Usage

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

Example

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

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

ip dhcp snooping option remote-id

Syntax

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

Parameter

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

Default

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

Mode

Global Configuration

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

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

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

show ip dhcp snooping option

Syntax show ip dhcp snooping option remote-id

Parameter None

Default No default is defined

Mode Privileged EXEC

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

Example The example shows how to show remote-id string

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

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
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 : 299
```

```
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
```

ip dhcp snooping database write-delay

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

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

Default DHCP snooping database write-delay is 300 seconds

Mode Global Configuration

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

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

```
switch(config)# ip dhcp snooping database write-delay 60
switch(config)# do show ip dhcp snooping database
Type : tftp: 192.168.1.50
FileName : backup_file
Write delay Timer : 60 seconds
Abort Timer : 300 seconds
```

```
Agent Running : Running
Delay Timer Expiry : 300 seconds
Abort Timer Expiry : 299
```

```
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
```

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	<p>The example shows how to set timeout timer to 60 seconds. You can verify settings by the following show ip dhcp snooping database command.</p> <pre>switch(config)# ip dhcp snooping database timeout 60 switch(config)# do show ip dhcp snooping database Type : tftp: 192.168.1.50 FileName : backup_file Write delay Timer : 300 seconds Abort Timer : 60 seconds Agent Running : Running Delay Timer Expiry : 300 seconds Abort Timer Expiry : 299 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>

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

```
Agent Running : Running
Delay Timer Expiry : 300 seconds
Abort Timer Expiry : 299
```

```
Last Succeeded Time : None
Last Failed Time : None
Last Failed Reason : No failure recorded.
```

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

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
```

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

```
Agent Running : Running  
Delay Timer Expiry : 300 seconds  
Abort Timer Expiry : 299
```

```
Last Succeeded Time : None  
Last Failed Time : None  
Last Failed Reason : No failure recorded.
```

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

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

```
Bind Table: Maximun Binding Entry Number 192
```

```
Port | VID | MAC Address | IP | Type | Lease Time  
-----+-----+-----+-----+-----+-----  
fa1 | 1 | 48:5B:39:C7:12:62 | 192.168.1.100(255.255.255.255)|DHCP Snooping | 86400
```

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
```

```
Type : tftp: 192.168.1.50
```

```
FileName : backup_file
```

```
Write delay Timer : 300 seconds
```

```
Abort Timer : 60 seconds
```

```
Agent Running : Running
```

```
Delay Timer Expiry : 300 seconds
```

```
Abort Timer Expiry : 299
```

```
Last Succeeded Time : None
```

```
Last Failed Time : None
```

```
Last Failed Reason : No failure recorded.
```

```
Total Attempts      : 1
```

```
Successful Transfers : 1  Failed Transfers :
```

```
0 Successful Reads  : 1
```

```
Failed Reads        : 0 Successful Writes :
```

```
0 Failed Writes    : 0
```

7. DoS

dos

Syntax

```
dos (daeqlsa-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-sport11024-deny|synfin-deny|synrst-deny|tcp-frag-off-min-check|tcpblat-deny|tcphdr-min-check|udpblat-deny|xmas-deny)
```

```
dos icmp-ping-max-length MAX_LEN
```

```
dos ipv6-min-frag-size-length MIN_LEN
```

```
dos smurf-netmask MASK
```

```
dos tcphdr-min-length HDR_MIN_LEN
```

```
no dos (tcp-frag-off-min-check|synrst-deny|synfin-deny|xma-deny|nullscan-deny|syn-sport11024-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|daeqlsa-deny)
```

Parameter

daeqlsa-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 <i>MAX_LEN</i> .
------------------------------	---

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 <i>MAX_LEN</i> .
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 <i>MIN_LEN</i> .
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 <i>HDR_MIN_LEN</i> .
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 <i>MAX_LEN</i>	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 <i>MIN_LEN</i>	Specify the minimum size of IPv6 fragments. The valid range is from 0 to 65535 bytes, and default value is 1240 bytes.
smurf-netmask <i>MASK</i>	Specify the netmask of smurf attack. The length range is from 0 to 323 bytes, and default length is 0 bytes.
tcphdr-min-length <i>HDR_MIN_LEN</i>	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	<p>The following example sets the minimum fragment size to 1024 bytes, and enables the minimum size of IPv6 fragments validation.</p> <pre>Switch(config)# dos ipv6-min-frag-size-length 1024 Switch(config)# dos ipv6-min-frag-size-check</pre>

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	<p>The following example enables the DoS on the interface fa1.</p> <pre>Switch(config)# interface fa1 Switch(config-if)# dos</pre>

show dos

Syntax	show dos show dos interface <i>IF_PORTS</i>
Parameter	interface An interface ID or the list of interface IDs. <u><i>IF_PORTS</i></u>
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.

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

```
Switch# show dos
```

The following example shows the status of DoS protection on the interface fa1.

```
Switch# show dos interfaces fa1
  Port   | DoS Protection
-----+-----
fa1     | disabled
```

8. Dynamic ARP Inspection

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	<p>The example shows how to enable Dynamic Arp Inspection on VLAN 1. You can verify settings by the following show ip arp inspection command.</p> <pre>switch(config)# ip arp inspection switch(config)# ip arp inspection vlan 1 switch(config)# show ip arp inspection Dynamic ARP Inspection : enabled Enable on Vlans : 1</pre>

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	<p>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.</p> <pre>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 Dynamic ARP Inspection : enabled Enable on Vlans : 1-100 switch(config)# no ip arp inspection vlan 30-40 switch(config)# show ip arp inspection Dynamic ARP Inspection : enabled Enable on Vlans : 1-29,41-100</pre>

ip arp inspection trust

Syntax

ip arp inspection trust

no ip arp inspection trust

Parameter

None

Default

Dynamic Arp inspection trust 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 gi1
switch(config)# ip arp inspection trust
switch(config)# do show ip arp inspection interface gi1
Interfaces | Trust State | Rate (pps) | SMAC Check | DMAC Check | IP Check/Allow Zero
|-----+-----+-----+-----+-----+-----+
gi1      | Trusted   | None      | disabled  | disabled  | disabled/disabled
```

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 gi1
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 gi1
Interfaces | Trust State | Rate (pps) | SMAC Check | DMAC Check | IP Check/Allow Zero
|
-----+-----+-----+-----+-----+-----+
gi1 | Untrusted | None | enabled | enabled | enabled/ enabled
```

ip arp inspection rate-limit

Syntax

ip arp inspection rate-limit
<1-50> [no] ip arp inspection
rate-limit

Parameter

<1-50> Set 1 to 50 PPS of DHCP packet rate limitation

Default

Default is un-limited of ARP packet

Mode

Interface Configuration

Usage

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

Example

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

```
switch(config)# interface gi1
switch(config)# ip arp inspection rate-limit 30
switch(config)# do show ip arp inspection interface gi1
Interfaces | Trust State | Rate (pps) | SMAC Check | DMAC Check | IP Check/Allow Zero
|
-----+-----+-----+-----+-----+-----+
gi1 | Untrusted | 30 | disabled | disabled | disabled/disabled
```

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 clear statistics on interface gi1. You can verify settings by the following **show ip arp inspection interface statistics** command.

```
switch# clear ip arp inspection interfaces gi1 statistics
switch# show ip arp inspection interfaces gi1 statistics
Port| Forward |Source MAC Failures|Dest MAC Failures|
SIP Validation Failures|DIP Validation Failures|IP-MAC Mismatch Failures
-----+-----+-----+-----+-----+-----+-----+-----
gi1| 0 | 0 | 0 | 0 | 0 | 0
```

show ip arp inspection

Syntax	show ip dhcp snooping
---------------	------------------------------

Parameter	None
------------------	-------------

Default	No default is defined
----------------	-----------------------

Mode	Privileged EXEC
-------------	-----------------

Usage	Use the show ip arp inspection command to show settings of Dynamic Arp Inspection
--------------	--

Example The example shows how to show settings of Dynamic Arp Inspection

```
switch(config)# show ip arp inspection
Dynamic ARP Inspection : enabled
Enable on Vlans       1
```

show ip arp inspeciton 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	<p>The example shows how to show settings of interface gi1.</p> <pre>switch# show ip arp inspection interface gi1 Interfaces Trust State Rate (pps) SMAC Check DMAC Check IP Check/Allow Zero -----+-----+-----+-----+-----+-----+ gi1 Trusted None disabled disabled disabled/disabled</pre> <p>The example shows how to show statistics of interface gi1.</p> <pre>switch# show ip arp inspection interfaces gi1 statistics Port Forward Source MAC Failures Dest MAC Failures SIP Validation Failures DIP Validation Failures IP-MAC Mismatch Failures -----+-----+-----+-----+-----+ gi1 0 0 0 0 0 0</pre>

9. GVRP

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

GVRP Status

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

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	<p>The following example specifies that set port gvrp test. The port gvrp enable must set port mode is trunk firstly.</p> <pre>Switch(config)#interface gi1 Switch(config-if)# switchport mode trunk Switch(config)#gvrp Switch# show gvrp configuration interfaces gi1 Port GVRP-Status Registration Dynamic VLAN Creation -----+-----+-----+----- gi1 Enabled Normal Disabled</pre>

gvrp registration-mode

Syntax	gvrp registration-mode (normal fixed forbidden)		
Parameter	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; vertical-align: top;">(normal fixed forbidden)</td> <td style="vertical-align: top;"> 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. </td> </tr> </table>	(normal fixed forbidden)	normal: register dynamic vlan, and transmit all vlan attribute. fixed: do not register dynamic vlan, and only transmit static vlan attribute. forbidden: do not register dynamic vlan, and only transmit default vlan attribute.
(normal fixed forbidden)	normal: register dynamic vlan, and transmit all vlan attribute. fixed: do not register dynamic vlan, and only transmit static vlan attribute. forbidden: do not register dynamic vlan, and only transmit default vlan attribute.		

Default	Default is Normal
Mode	Interface mode
Usage	When set registration-mode is fixed or forbidden, will remove the port from vlan witch is dynamic port. And do not learning vlan.
Example	<p>The following example specifies that set gvrp registration mode test.</p> <pre>Switch(config)# interface gi1 Switch(config-if)# gvrp registration-mode fixed Switch# show gvrp configuration interfaces gi1 Port GVRP-Status Registration Dynamic VLAN Creation -----+-----+-----+----- gi1 Enabled Fixed Disabled</pre>

gvrp vlan-create-forbid

Syntax	gvrp vlan-creation-forbid no gvrp vlan-creation-forbid
Parameter	none
Default	Default is disabled.
Mode	Interface mode
Usage	‘gvrp vlan-creation-forbid’ will not remove dynamic port from vlan immediate.
Example	<p>The following example specifies that set port gvrp vlan-creation-forbid test.</p> <pre>Switch(config)#interface gi1 Switch(config-if)# gvrp vlan-creation-forbid Switch(config-if)#exit Switch# show gvrp configuration interfaces gi1 Port GVRP-Status Registration Dynamic VLAN Creation -----+-----+-----+----- gi1 Enabled Normal Enabled</pre>

clear gvrp statistics

Syntax	clear gvrp (error-statistics statistics) [interfaces IF_PORTS]	
Parameter	(error-statistics statistics) [interfaces IF_PORTS]	Error-statistics: error gvrp packet statistics Statistics: gvrp event message statistics Specifies posts to clear statistics
Default	none	
Mode	Privileged EXEC	
Usage	This command will clear the ports error statistics or statistics info.	
Example	<p>The following example specifies that clear gvrp error statistics and statistics test.</p> <pre>Switch# clear gvrp statistics Switch# clear gvrp error-statistics</pre>	

show gvrp statistics

Syntax	show gvrp (statistics error-statistics) [interfaces IF_PORTS]	
Parameter	none (statistics error-statistics) [interfaces IF_PORTS]	Display all ports statistics – GVRP statistics error-statistics GVRP error statistics Specifies posts
Default	Display all ports statistics info	
Mode	Privileged EXEC	
Usage	This command will display the ports error statistics or statistics info.	

Example

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

Switch# **show gvrp statistics**

```
Port id      : fa1
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      : fa2
Total RX     : 0
JoinEmpty RX : 0
JoinIn RX    : 0
Empty RX     : 0
LeaveIn RX    : 0
LeaveEmpty RX :
              0
LeaveAll RX   : 0
Total TX     : 0
...
```

Switch# **show gvrp error-statistics**

```
INVPROT : Invalid protocol Id
INVATYP  : Invalid Attribute Type
INVALEN  : Invalid Attribute Length
INVAVAL  : Invalid Attribute Value
INVEVENT : Invalid Event
Port | INVPROT | INVATYP | INVALEN | INVAVAL | INVEVENT
gi1   | 0         | 0         | 0         | 0         | 0
gi2   | 0         | 0         | 0         | 0         | 0
gi3   | 0         | 0         | 0         | 0         | 0
gi4   | 0         | 0         | 0         | 0         | 0
gi5   | 0         | 0         | 0         | 0         | 0
gi6   | 0         | 0         | 0         | 0         | 0
```

show gvrp

Syntax `show gvrp`

Parameter	none
------------------	------

Default	None
Mode	Privileged EXEC
Usage	This command will display the gvrp global info.
Example	<p>The following example specifies that display gvrp test.</p> <pre>Switch# show gvrp GVRP Status ----- GVRP : Disabled Join time : 200 ms Leave time : 600 ms LeaveAll time : 10000 ms</pre>

show gvrp configuration

Syntax	show gvrp configuration [interface IF_PORTS]				
Parameter	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">none</td> <td style="padding: 2px;">Display all ports configuration</td> </tr> <tr> <td style="padding: 2px;">[interfaces IF_PORTS]</td> <td style="padding: 2px;">Display Specifies posts configuration</td> </tr> </table>	none	Display all ports configuration	[interfaces IF_PORTS]	Display Specifies posts configuration
none	Display all ports configuration				
[interfaces IF_PORTS]	Display Specifies posts configuration				
Default	Display all ports configuration info				
Mode	Privileged EXEC				
Usage	This command will display the ports configuration info.				
Example	<p>The following example specifies that display gvrp port configuration test.</p> <pre>Switch# show gvrp configuration Port GVRP-Status Registration Dynamic VLAN Creation -----+-----+-----+----- gi1 Disabled Normal Enabled gi 2 Disabled Normal Enabled</pre>				

gi 3	Disabled	Normal	Enabled
gi 4	Disabled	Normal	Enabled
gi 5	Disabled	Normal	Enabled
gi 6	Disabled	Normal	Enabled
gi 7	Disabled	Normal	Enabled
--More--			

10. IGMP Snooping

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

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.

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(config)# **ip igmp snooping version 3**

ip igmp snooping unknown-multicast action

Syntax **ip igmp snooping unknown-multicast action (drop | flood |router-port)**
no ip igmp snooping unknown-multicast action

Parameter (drop | flood | router-port) Drop 、 flood in vlan or forward to router port of unknown multicast packet

Default Default is flood.

Mode Global Configuration

Usage When igmp and mld snooping disabled, it can't set action router-port. When disable igmp snooping & mld snooping, it set unknown multicast action flood. When action is router-port to flood or drop, it will delete the unknown multicast group entry.

Use the **ip igmp snooping unknown-multicast action** command to change action.

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

You can verify settings by the **show ip igmp snooping** command.

Example The following example specifies that set ip igmp unknown multicast action router-port test.
Switch(config)# **ip igmp snooping**
Switch(config)# **ip igmp snooping unknown-multicast action router-port**

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**

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
```

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

ip igmp snooping vlan last-member-query-count

Syntax	ip igmp snooping vlan <VLAN-LIST> last-member-query-count <1-7> no ip igmp snooping vlan <VLAN-LIST> last-member-query-count
Parameter	VLAN-LIST specifies VLAN ID list to set last-member-query-count <1-7> specifies last member query count to set.
Default	Default is 2
Mode	Global Configuration
Usage	Use the ip igmp snooping vlan last-member-query-count command to change how many query packets will send. Use the no form of this command to restore to default. You can verify settings by the show ip igmp snooping vlan command
Example	The following example specifies that set ip igmp snooping vlan last-member-query-count test. Switch(config)# ip igmp snooping vlan 1 last-member-query-count 5

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**

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 <30-18000>	specifies query interval to set

Default

Default is 125

Mode

Global Configuration

Usage

Use the **ip igmp snooping vlan query-interval** command to set interval between each query.
Use the **no** form of this command to restore to default
You can verify settings by the **show ip igmp snooping vlan** command

Example

The following example specifies that set **ip igmp snooping vlan query-interval** test.
Switch(config)# **ip igmp snooping vlan 1 query-interval 100**

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

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 specifies a robustness value to set <1-7>
Default	Default is 2
Mode	Global Configuration
Usage	Use the ip igmp snooping vlan robustness-variable command to times to retry. Use the no form of this command to restore to default You can verify settings by the show ip igmp snooping vlan command
Example	The following example specifies that set ip igmp snooping vlan parameters test. Switch(config)# ip igmp snooping vlan 1 robustness-variable

ip igmp snooping vlan router

Syntax	ip igmp snooping vlan VLAN-LIST router learn pim-dvmrp no ip igmp snooping vlan VLAN-LIST router learn pim-dvmrp
---------------	---

Parameter	VLAN-LIST specifies VLAN ID list to set
Default	Default is enabled
Mode	Global Configuration
Usage	Use the ip igmp snooping vlan router command to enable learning router port by routing protocol packets such as PIM/PIMv2, DVMRP, MOSPF. Use the no form of this command to disable. You can verify settings by the show ip igmp snooping vlan command
Example	The following example specifies that set ip igmp snooping vlan router test . Switch(config)# ip igmp snooping vlan 99 router

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	<p>‘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’.</p> <p>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.</p>

Example The following example specifies that set ip igmp snooping static/forbidden port test.
Switch(config)# **ip igmp snooping vlan 1 forbidden -port gi3-4**

ip igmp snooping vlan static-port

Syntax **ip igmp snooping vlan <VLAN-LIST> static-port IF_PORTS**
no ip igmp snooping vlan <VLAN-LIST> static-port IF_PORTS

Parameter	VLAN-LIST	specifies VLAN ID list to set
	IF_PORTS	specifies a port list to set or remove

Default No static port by default

Mode Global Configuration

Usage

Use the **ip igmp snooping vlan static-port** command to add static forwarding port, all known vlan 1 ipv4 group will add the static ports.
Use the **no** form of this command to delete static port.
You can verify settings by the **show ip igmp snooping forward-all** command.

Example The following example specifies that set ip igmp snooping static port test.
Switch(config)# **ip igmp snooping vlan 1 static -port gi1-2**

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 gi2**

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 gi1-2**

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-addr	specifies multicast group ipv4 address
	IF_PORTS	specifies port list to set or remove
Default	No static group by default	
Mode	Global Configuration	
Usage	<p>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.</p> <p>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.</p> <p>You can verify settings by the show ip igmp snooping group command.</p>	
Example	<p>The following example specifies that set ip igmp snooping static group test.</p> <pre>Switch(config)# ip igmp snooping vlan 1 static-group 224.1.1.1 interfaces gi1-2</pre>	

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-addr	specifies multicast group ipv4 address
Default	None	
Mode	Global Configuration	
Usage	<p>Use the no ip igmp snooping vlan group command to delete a group which could be static or dynamic.</p> <p>You can verify settings by the show ip igmp snooping group command.</p>	
Example	<p>The following example specifies that set ip igmp snooping static group test.</p> <pre>Switch(config)# no ip igmp snooping vlan 1 group 224.1.1.1</pre>	

profile range

Syntax `profile range ip <ip-addr> [ip-addr] action (permit | deny)`

<ip-addr>	Start ipv4 multicast address
[ip-addr]	End ipv4 multicast address
(permit deny)	Permit: allow Multicast address range ip address learning deny: do not allow Multicast address range ip address learning

Default None

Mode igmp profile configuration mode

Usage Use the **profile** command to generate IGMP profile.
You can verify settings by the **show ip igmp profile** command

Example The following example specifies that set ip igmp profile test.
Switch(config)# **ip igmp profile 1**
Switch(config-igmp-profile)# **profile range ip 224.1.1.1 224.1.1.8 action permit**

ip igmp profile

Syntax `ip igmp profile <1-128>`
`no ip igmp profile <1-128>`

Parameter <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

ip igmp filter

Syntax	ip igmp filter <1-128> [no] ip igmp filter
Parameter	<1-128> specifies profile ID
Default	None
Mode	Port Configuration
Usage	Use the ip igmp filter command to bind a profile for port. When the port bind a profile. Then the port learning group will update, if the group is not match the profile rule it will remove the port from the group. Static group is excluded. Use the no form of this command to delete profile You can verify settings by the show ip igmp filter command
Example	The following example specifies that set ip igmp filter test. Switch(config)# interface gi1 Switch(config-if)# ip igmp filter 1

ip igmp max-groups

Syntax	ip igmp max-groups <0-1024> no ip igmp max-groups
---------------	--

Parameter	<0-1024>	The maximum number of IGMP groups that an interface can join.
Default	Default is 1024	
Mode	Port Configuration	
Usage	<p>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.</p> <p>Use the no form of this command to restore to default You can verify settings by the show ip igmp max-groups command.</p>	
Example	The following example specifies that set ip igmp max-groups test. Switch(config-if)# ip igmp max-groups 10	

ip igmp max-groups action

Syntax	ip igmp max-groups action (deny replace)	
Parameter	(deny replace)	Deny: current port igmp group arrived max-groups, don't add group. Replace: current port igmp group arrived max-groups, remove port for rand group, and add port to new group.
Default	Default action is deny	
Mode	Port Configuration	
Usage	<p>Use the ip igmp max-groups action command to set the action when the numbers of groups reach the limitation.</p> <p>Use the no form of this command to restore to default You can verify settings by the show ip igmp max-groups command.</p>	
Example	The following example specifies that set action replace test. Switch(config-if)# ip igmp max-groups action replace	

clear ip igmp snooping groups

Syntax	clear ip igmp snooping groups [(dynamic static)]				
Parameter	<table border="1"> <tr> <td>none</td> <td>Clear ip igmp groups include dynamic and static</td> </tr> <tr> <td>(dynamic static)</td> <td>Ip igmp group type is dynamic or static</td> </tr> </table>	none	Clear ip igmp groups include dynamic and static	(dynamic static)	Ip igmp group type is dynamic or 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	<p>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.</p>				
Example	<p>The following example specifies that clear ip igmp snooping groups test.</p> <pre>Switch# clear ip igmp snooping groups Switch# show ip igmp snooping groups VLAN Group IP Address Type Life(Sec) Port -----+-----+-----+-----+----- Total Number of Entry = 0</pre>				

clear ip igmp snooping statistics

Syntax	clear ip igmp snooping statistics
Parameter	none
Default	None
Mode	Privileged EXEC
Usage	<p>This command will clear the igmp statistics. You can verify settings by the show ip igmp snooping command.</p>

Example The following example specifies that clear ip igmp snooping statistics test.
 Switch# **clear ip igmp snooping statistics**
 Switch# **show ip igmp snooping**
 IGMP Snooping Status

```

Snooping                : Enabled
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
Leave TX                 : 0
Report TX               : 0
General Query TX        : 0
Specail Group Query TX  : 0
Specail Group & Source Query TX : 0
  
```

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	<p>The following example specifies that display ip igmp snooping group counter test.</p> <p>Switch# show ip igmp snooping group counters</p>

Total ip igmp snooping group number: 2
Total ip igmp snooping static mac number: 0

show ip igmp snooping groups

Syntax	show ip igmp snooping groups [(dynamic static)]				
Parameter	<table border="1"> <tr> <td>none</td> <td>Show ip igmp groups include dynamic and static</td> </tr> <tr> <td>(dynamic static)</td> <td>Display Ip igmp group type is dynamic or static</td> </tr> </table>	none	Show ip igmp groups include dynamic and static	(dynamic static)	Display Ip igmp group type is dynamic or static
none	Show 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	<p>The following example specifies that show ip igmp snooping groups.</p> <p>Switch# show ip igmp snooping groups</p> <p>VLAN Group IP Address Type Life(Sec) Port</p> <pre>-----+-----+-----+-----+----- 1 224.1.2.3 Static -- fa9 1 224.1.2.4 Static -- fa10</pre> <p>Total Number of Entry = 2</p>				

show ip igmp snooping router

Syntax	show ip igmp snooping router [(dynamic forbidden static)]				
Parameter	<table border="1"> <tr> <td>none</td> <td>Show ip igmp router include dynamic and static and forbidden</td> </tr> <tr> <td>(dynamic forbidden static)</td> <td>Display Ip igmp router info for different type</td> </tr> </table>	none	Show ip igmp router include dynamic and static and forbidden	(dynamic forbidden static)	Display Ip igmp router info for different type
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	<p>The following example specifies that show ip igmp snooping router.</p> <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 fa4 Total Entry 1 Forbidden Router Table VID Port Mask -----+----- 1 fa8 Total Entry 1 </pre>

show ip igmp snooping querier

Syntax	show ip igmp snooping querier
Parameter	none Show all vlan ip igmp querier info.
Default	None
Mode	Privileged EXEC
Usage	This command will display all of the static vlan ip igmp querier info.

Example The following example specifies that show ip igmp snooping querier test.

```
Switch# show ip igmp snooping querier
  VID | State | Status | Version | Querier IP
-----+-----+-----+-----+-----
   1 | Disabled | Non-Querier | No | -----

Total Entry 1
```

show ip igmp snooping

Syntax show ip igmp snooping

Parameter None

Default None

Mode Privileged EXEC

Usage This command will display ip igmp snooping global info.

Example The following example specifies that show ip igmp snooping test.

```
Switch# show ip igmp snooping
  IGMP Snooping Status
  -----

Snooping                : Enabled
Report Suppression      : Enabled
Operation Version       : v2
Forward Method          : mac
Unknown 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

show ip igmp snooping vlan

Syntax	show ip igmp snooping vlan [VLAN-LIST]				
Parameter	<table border="1"> <tr> <td>none</td> <td>Show all ip igmp snooping vlan info</td> </tr> <tr> <td>[VLAN-LIST]</td> <td>Show specifies vlan ip igmp snooping info</td> </tr> </table>	none	Show all ip igmp snooping vlan info	[VLAN-LIST]	Show specifies vlan ip igmp snooping info
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	<p>The following example specifies that show ip igmp snooping vlan test.</p> <pre>Switch# show ip igmp snooping vlan 1 IGMP Snooping is globaly enabled IGMP Snooping VLAN 1 admin : disabled IGMP Snooping operation mode : disabled IGMP Snooping robustness: admin 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 1 sec oper 1 sec IGMP Snooping last immediate leave: disabled IGMP Snooping automatic learning of multicast router ports: enabled</pre>				

show ip igmp snooping forward-all

Syntax	show ip igmp snooping forward-all [vlan VLAN-LIST]				
Parameter	<table border="1"> <tr> <td>none</td> <td>Show all ip igmp snooping vlan forward-all info</td> </tr> <tr> <td>[vlan VLAN-LIST]</td> <td>Show specifies vlan of ip igmp forward info.</td> </tr> </table>	none	Show all ip igmp snooping vlan forward-all info	[vlan VLAN-LIST]	Show specifies vlan of ip igmp forward info.
none	Show all ip igmp snooping vlan forward-all info				
[vlan 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	<p>The following example specifies that show ip igmp snooping forward-all test.</p> <pre>Switch# show ip igmp snooping forward-all 1 IGMP Snooping VLAN 1 IGMP Snooping static port : None IGMP Snooping forbidden port : None</pre>

show ip igmp profile

Syntax	show ip igmp profile [<1-128>]				
Parameter	<table border="1"> <tr> <td>none</td> <td>Show all ip igmp snooping profile info</td> </tr> <tr> <td>[<1-128>]</td> <td>Show specifies index profile info</td> </tr> </table>	none	Show all ip igmp snooping profile info	[<1-128>]	Show specifies index profile info
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	<p>The following example specifies that show ip igmp profile test.</p> <pre>Switch# show ip igmp profile IP igmp profile index: 1 IP igmp profile action: permit Range low ip: 224.1.1.1 Range high ip: 224.1.1.8 IP igmp profile index: 2 IP igmp profile action: deny Range low ip: 225.1.1.0 Range high ip: 225.1.2.1</pre>				

show ip igmp filter

Syntax	show ip igmp filter [interfaces IF_PORTS]		
Parameter	<table border="1"> <tr> <td>none</td> <td>Show all port filter</td> </tr> </table>	none	Show all port filter
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	<p>The following example specifies that show ip igmp filter test.</p> <pre>Switch# show ip igmp filter Port ID Profile ID -----+----- gi1 : 1 gi2 : None gi3 : None gi4 : None gi5 : None --More--</pre>	

show ip igmp max-group

Syntax	show ip igmp 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 ip igmp port max-group.	
Example	<p>The following example specifies that show ip igmp max-group test.</p> <pre>Switch(config-if)#ip igmp max-groups 50 Switch# show ip igmp max-group</pre>	

```
Port ID | Max Group
```

```
-----+-----
```

```
gi1 : 50
gi2 : 256
gi3 : 256
gi4 : 256
gi5 : 256
```

```
--More--
```

show ip igmp max-group action

Syntax	<code>show ip igmp max-group action [interfaces IF_PORTS]</code>				
Parameter	<table border="1"> <tr> <td>none</td> <td>Show all port max-group action</td> </tr> <tr> <td>[interfaces IF_PORTS]</td> <td>Show specifies ports max-group action</td> </tr> </table>	none	Show all port max-group action	[interfaces IF_PORTS]	Show specifies ports max-group action
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	<p>The following example specifies that show ip igmp max-group action test.</p> <pre>Switch(config)#interface gi1 Switch(config-if)#ip igmp max-groups action replace Switch# show ip igmp max-group action Port ID Max-groups Action -----+----- gi1 : replace gi2 : deny gi3 : deny gi4 : deny gi5 : deny --More--</pre>				

11. IP Source Guard

ip source verify

Syntax	ip source verify [mac-and-ip] no ip source verify												
Parameter	mac-and-ip Verify by mac and ip address boundle												
Default	IP Source Guard is disabled on interface. Default is that verifying ip address only												
Mode	Port Configuration												
Usage	Use the ip source verify command to enable IP Source Guard function. Default IP Source Guard filter source IP address. The “ mac-and-ip ” filters not only source IP address but also source MAC address. Use the no form of this command to disable. You can verify settings by the show ip source interfaces command.												
Example	<p>The example shows how to enable IP Source Guard with source IP address filtering on interface gi1.</p> <pre>Switch(config)# interface gi1 switch(config-if)# ip source verify</pre> <p>The example shows how to enable IP Source Guard with source IP and MAC address filtering on interface gi2.</p> <pre>Switch(config)# interface gi2 switch(config-if)# ip source verify mac-and-ip switch(config-if)# do show ip source interfaces gi1-2</pre> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Port</th> <th style="text-align: left;">Status</th> <th style="text-align: left;">Max Entry</th> <th style="text-align: left;">Current Entry</th> </tr> </thead> <tbody> <tr> <td style="border-top: 1px dashed black;">gi1</td> <td style="border-top: 1px dashed black;">Verify MAC+IP</td> <td style="border-top: 1px dashed black;">No Limit</td> <td style="border-top: 1px dashed black;">0</td> </tr> <tr> <td style="border-bottom: 1px solid black;">gi2</td> <td style="border-bottom: 1px solid black;">disabled</td> <td style="border-bottom: 1px solid black;">No Limit</td> <td style="border-bottom: 1px solid black;">0</td> </tr> </tbody> </table>	Port	Status	Max Entry	Current Entry	gi1	Verify MAC+IP	No Limit	0	gi2	disabled	No Limit	0
Port	Status	Max Entry	Current Entry										
gi1	Verify MAC+IP	No Limit	0										
gi2	disabled	No Limit	0										

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	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">A:B:C:D:E:F</td> <td>Specify a MAC address of a binding entry</td> </tr> <tr> <td>VLAN <1-4094></td> <td>Specify a VLAN ID of a binding entry</td> </tr> <tr> <td>A.B.C.D</td> <td>Specify IP address and MASK of a binding entry.</td> </tr> <tr> <td>IF_PORT</td> <td>Specify interface of a binding entry.</td> </tr> </table>	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.
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	<p>The example shows how to add a static IP source binding entry.</p> <pre>Switch(config)# ip source binding 00:11:22:33:44:55 vlan 1 192.168.1.55 interface fa1 switch(config)# do show ip source binding Bind Table: Maximun Binding Entry Number 192 Port VID MAC Address IP Type Lease Time -----+-----+-----+-----+-----+----- fa1 1 00:11:22:33:44:55 192.168.1.55(255.255.255.255) Static NA</pre>

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	<p>The example shows how to show settings of IP Source Guard of interface gi1</p> <pre>switch# show ip source interfaces gi1 Port Status Max Entry Current Entry -----+-----+-----+----- gi1 Verify MAC+IP No Limit 0</pre>

show ip source binding

Syntax	show ip source binding [(dynamic static)]				
Parameter	<table border="1"> <tr> <td>dynamic</td> <td>Show entries that added by DHCP snooping learn</td> </tr> <tr> <td>static</td> <td>Show entries that added by user</td> </tr> </table>	dynamic	Show entries that added by DHCP snooping learn	static	Show entries that added by user
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	<p>The example shows how to show static binding entries of IP Source Guard.</p> <pre>switch# show ip source binding Bind Table: Maximun Binding Entry Number 192 Port VID MAC Address IP Type Lease Time -----+-----+-----+-----+-----+----- fa1 1 00:11:22:33:44:55 192.168.1.55(255.255.255.255) Static NA</pre>				

12. Link Aggregation

lag

Syntax	lag <I-8> mode (static active passive) no lag								
Parameter	<table border="1"> <tr> <td><I-8></td> <td>Specify the LAG id for the interface</td> </tr> <tr> <td>static</td> <td>Specify the LAG to be static mode and join the interface into this LAG.</td> </tr> <tr> <td>active</td> <td>Specify the LAG to be dynamic mode and join the interface into this LAG with LACP active port.</td> </tr> <tr> <td>passive</td> <td>Specify the LAG to be dynamic mode and join the interface into this LAG with LACP passive port.</td> </tr> </table>	<I-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.
<I-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 fa1-fa3 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
Load Balancing: src-dst-mac-ip.
```

Group ID	Type	Ports
1	LACP	Inactive: fa1-3 2
3		
4		
5		
6		
7		
8		

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 packets.

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**
Load Balancing: src-dst-mac-ip.

Group ID	Type	Ports
1	-----	
2	-----	
3	-----	
4	-----	
5	-----	
6	-----	
7	-----	
8	-----	

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 fa1**
Switch(config-if)# **lacp port-priority 100**

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	<p>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.</p> <p>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.</p>
Example	<p>This example shows how to configure lacp system priority to 1000.</p> <pre>Switch(config)# lacp system-priority 1000</pre>

lacp timeout

Syntax	lacp timeout (long short) no lacp timeout				
Parameter	<table><tr><td>long</td><td>Send LACP packet every 30 seconds.</td></tr><tr><td>short</td><td>Send LACP packet every 1 second.</td></tr></table>	long	Send LACP packet every 30 seconds.	short	Send LACP packet every 1 second.
long	Send LACP packet every 30 seconds.				
short	Send LACP packet every 1 second.				
Default	Default LACP timeout is long.				
Mode	Interface Configuration				
Usage	<p>LACP need to send LACP packet to partner switch to check the link status. This command configure the interval of sending LACP packets.</p> <p>The only way to show this configuration is using “show running-config” command.</p>				
Example	<p>This example shows how to configure interface fa1 lacp timeout to short.</p> <pre>Switch(config)# interface fa1 Switch(config-if)# lacp timeout short</pre>				

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
```

```
                LACPDUs      LACPDUs  
Port           Sent   Recv   Pkts Err
```

```

-----
Channel group 1
fa1          0          0          0
fa2          0          0          0
  
```

This example shows how to show LACP local information.

```

Switch# show lacp internal
Flags:  S - Device is requesting Slow LACPDUs
        F - Device is requesting Fast LACPDUs
        A - Device is in Active mode           P - Device is
in Passive mode
  
```

```

Channel group 1

Port          Port          LACP port      Admin      Oper
Port          Flags   State          Priority    Key
              Key Number
fa1           SA      down           1           0x3e8
              0x3e8 0x1           0x45
fa2           SA      down           1           0x3e8
              0x3e8 0x2           0x45
  
```

This example shows how to show LACP remote information.

```

Switch# show lacp neighbor
Flags:  S - Device is sending Slow LACPDUs
        F - Device is sending Fast LACPDUs
        A - Device is in Active mode           P - Device is
in Passive mode
  
```

```

Channel group 1

neighbors Partner's
information:

Port          Port          LACP port      Admin      Oper
Port          Flags   Priority    Dev ID      Age      key      Key Number State
fa1           FP      32768      0000.0000.0000 0s      0x3e8
0x3e8 0x1     0x56
fa2           FP      32768      0000.0000.0000 0s      0x3e8
0x3e8 0x2     0x56
  
```

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  
Load Balancing: src-dst-mac-ip.
```

Group ID	Type	Ports
1	LACP	Inactive: fa1-3 2
3		
4		
5		
6		
7		
8		

13. LLDP

clear lldp statistics

Syntax **clear lldp statistics**

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
```

lldp

Syntax **lldp**
no lldp

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
```

```
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
fa1	RX, TX		192.168.1.2
fa2	RX, TX		192.168.1.2
fa3	RX, TX		192.168.1.2
fa4	RX, TX		192.168.1.2
fa5	RX, TX		192.168.1.2

lldp rx

Syntax **lldp rx**
no lldp rx

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.

Use the **no** form of this command to disable the RX ability.

Example This example sets port gi1 to enable LLDP TX, port gi2 to disable RX but enable TX, port gi3 to enable RX but disable TX, port gi4 to disable RX and TX.

```
Switch (config)# interface gi1
Switch (config-if)# lldp rx
```

```
Switch(config-if)# lldp tx
Switch(config)# interface
gi2 Switch(config-if)# no
lldp rx Switch(config-if)#
lldp tx Switch(config)#
interface gi3
Switch(config-if)# lldp rx
Switch(config-if)# no lldp
tx Switch(config)#
interface gi4
Switch(config-if)# no lldp
rx Switch(config-if)# no
lldp tx Switch(config-if)#
end
Switch# show lldp interfaces gi1-4
```

```
State: Enabled
Timer: 30
Seconds
Hold multiplier: 4
Reinit delay: 2
Seconds Tx delay: 2
Seconds
LLDP packet handling: Bridging
```

Port	State	Optional TLVs	Address
gi1	RX, TX	192.168.1.254	
gi2	TX		192.168.1.254
gi3	RX		192.168.1.254
gi4	Disable		192.168.1.254

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
```

```
State:  
Disabled Timer:  
10 Seconds  
Hold multiplier: 4  
Reinit delay: 2  
Seconds Tx delay: 2  
Seconds  
LLDP packet handling: Flooding
```

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  
  
State: Disabled  
Timer: 10 Seconds  
Hold multiplier: 4  
Reinit delay: 5 Seconds  
Tx delay: 2 Seconds  
LLDP packet handling: Flooding
```

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	<p>Use “lldp holdtime-multiplier” command to configure the LLDP PDU hold multiplier that decides time-to-live (TTL) value sent in LLDP advertisements: TTL = (tx-interval * holdtime-multiplier). The configuration could be shown by “show lldp” command.</p> <p>Use the no form of this command to restore the multiplier to default value.</p>
Example	<p>This example sets LLDP hold time multiplier to 3.</p> <pre>Switch(config)# lldp holdtime-multiplier 3 Switch# show lldp State: Disabled Timer: 10 Seconds Hold multiplier: 3 Reinit delay: 2 Seconds Tx delay: 2 Seconds LLDP packet handling: Flooding</pre>

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 (forwarded 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
```

```
State: Enabled  
Timer: 30 Seconds  
Hold multiplier: 4  
Reinit delay: 2 Seconds  
Tx delay: 2 Seconds  
LLDP packet handling: Bridging
```

lldp med

Syntax

lldp med
no lldp med

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 gi1
Switch(config-if)# lldp med
Switch(config)# interface gi2
Switch(config-if)# no lldp med
Switch# show lldp interfaces gi1-2 med
```

Port	Capabilities	Network Policy	Location
Inventory			
---	+	+	+

gi1	Yes	Yes	No
No			
gi2	No	Yes	No
No			

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	<p>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.</p> <p>Use the no form of this command to restore count to default.</p>
Example	<p>This example sets fast start repeat count to 10.</p> <pre>Switch(config)# lldp med fast-start-repeat-count 10 Switch# show lldp med Fast Start Repeat Count: 10 lldp med network-policy voice: auto</pre>

lldp med location

Syntax	lldp med location (coordination civic-address ecs-elin) ADDR no lldp med location (coordination civic-address ecs-elin)								
Parameter	<table border="1"> <tr> <td>coordination</td> <td>Location type to be configured. “ecs-elin” is abbreviation of emergency call service – emergency location identifier number</td> </tr> <tr> <td>civic-address</td> <td></td> </tr> <tr> <td>ecs-elin</td> <td></td> </tr> <tr> <td>ADDR</td> <td>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.</td> </tr> </table>	coordination	Location type to be configured. “ecs-elin” is abbreviation of emergency call service – emergency location identifier number	civic-address		ecs-elin		ADDR	Specify the location data. Input format is hexadecimal values without colon (for example: 1234AB). For coordination location type, the length of ADDR is 16 bytes. For civic-address, the length is 6 to 160 bytes. For ecs-elin, the length is 10 to 25 bytes.
coordination	Location type to be configured. “ecs-elin” is abbreviation of emergency call service – emergency location identifier number								
civic-address									
ecs-elin									
ADDR	Specify the location data. Input format is hexadecimal values without colon (for example: 1234AB). For coordination location type, the length of ADDR is 16 bytes. For civic-address, the length is 6 to 160 bytes. For ecs-elin, the length is 10 to 25 bytes.								

Default	Deafult is no location data.
Mode	Port Configuration
Usage	Use “ lldp med location ” command to configure the LLDP MED location data. The “coordinate”, “civic-address”, “ecs-elin” locations are independent, so at most three location TLVs could be sent if their data are not empty. The configuration of location could be shown by “ show lldp interface PORT med ” command. Use the no form of this command to clear location data.

Example	<p>This example sets location data for interface gil.</p> <pre>Switch(config)# interface gil 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 gil med</pre> <table border="1"> <thead> <tr> <th>Port</th> <th>Capabilities</th> <th>Network Policy</th> <th>Location</th> </tr> </thead> <tbody> <tr> <td>gil</td> <td>Yes</td> <td>Yes</td> <td>Yes</td> </tr> </tbody> </table> <pre>Port ID: gil Network policies: 1, 32 Location: Coordinates: 112233445566778899AABBCCDDEEFF00 Civic-address: 112233445566 Ecs-elin: 112233445566778899AA</pre>	Port	Capabilities	Network Policy	Location	gil	Yes	Yes	Yes
Port	Capabilities	Network Policy	Location						
gil	Yes	Yes	Yes						

lldp med network-policy

Syntax	<p>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></p> <p>no lldp med network-policy <1-32></p>				
Parameter	<table border="1"> <tr> <td><1-32></td> <td>Specify the network policy index</td> </tr> <tr> <td>voice voice-signaling guest-voice</td> <td>Specify the network policy application type.</td> </tr> </table>	<1-32>	Specify the network policy index	voice voice-signaling guest-voice	Specify the network policy application type.
<1-32>	Specify the network policy index				
voice voice-signaling guest-voice	Specify the network policy application type.				

**guest-voice-
signaling
softphone-voice
video-
conferencing
streaming-video
video-signaling**

<1-4094>	Specify the VLAN ID
tag untag	Specify the VLAN tag status
<0-7>	Specify the L2 priority
<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
```

```
Fast Start Repeat Count: 10
lldp med network-policy voice: auto
```

```
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
```


lldp med network-policy (Interface)

Syntax	lldp med network-policy (add remove) <1-32>						
Parameter	<table border="1"> <tr> <td>add</td> <td>Add network policy binding for ports.</td> </tr> <tr> <td>remove</td> <td>Remove network policy binding for ports.</td> </tr> <tr> <td><1-32></td> <td>Specify the network policy index</td> </tr> </table>	add	Add network policy binding for ports.	remove	Remove network policy binding for ports.	<1-32>	Specify the network policy index
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	<p>This example binds network policy for interface gi1 and gi2.</p> <pre>Switch# show lldp med Fast Start Repeat Count: 10 lldp med network-policy voice: auto 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 gi1,2 Switch(config-if-range)# lldp med network-policy add 1,32 Switch# show lldp interfaces gi1,2 med Port Capabilities Network Policy Location Inventory -----+-----+-----+-----+ -- gi1 Yes Yes Yes gi2 Yes Yes Yes</pre>						

```
Port ID: gi1
Network policies: 1, 32
```

```
Port ID: gi2
Network policies: 1, 32
```

lldp med network-policy voice auto

Syntax **lldp med network-policy voice auto**
no lldp med network-policy voice auto

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.

```
Switch (config)# lldp med network-policy auto
Switch# show lldp med
```

```
Fast Start Repeat Count: 10
lldp med network-policy voice: auto
```

```
Switch (config)# no lldp med network-policy auto
Switch# show lldp med
```

```
Fast Start Repeat Count: 10
lldp med network-policy voice: manual
```

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
```

Port	Capabilities	Network Policy	Location	Inventory
gi1	Yes	Yes	Yes	Yes
gi2	Yes	No	No	No

lldp tlv-select

Syntax **lldp 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-addr (management address).

Default	Default is no selected optional TLV.																				
Mode	Port Configuration																				
Usage	<p>Use “lldp tlv-select” command to attach selected TLV in PDU. The configuration could be shown by “show lldp” command.</p> <p>Use the no form of this command to remove all selected TLV.</p>																				
Example	<p>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.</p> <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</pre> <pre>State: Disabled Timer: 10 Seconds Hold multiplier: 3 Reinit delay: 2 Seconds Tx delay: 2 Seconds LLDP packet handling: Flooding</pre> <table border="0" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="border-right: 1px solid black; border-bottom: 1px solid black;">Port</th> <th style="border-right: 1px solid black; border-bottom: 1px solid black;">State</th> <th style="border-right: 1px solid black; border-bottom: 1px solid black;">Optional TLVs</th> <th style="border-bottom: 1px solid black;">Address</th> </tr> </thead> <tbody> <tr> <td style="border-right: 1px solid black;">-----</td> <td style="border-right: 1px solid black;">+</td> <td style="border-right: 1px solid black;">-----</td> <td style="border-right: 1px solid black;">-----</td> </tr> <tr> <td style="border-right: 1px solid black;"></td> <td style="border-right: 1px solid black;"></td> <td style="border-right: 1px solid black;"></td> <td style="border-right: 1px solid black;">gi1</td> </tr> <tr> <td style="border-right: 1px solid black;"></td> <td style="border-right: 1px solid black;">RX,TX</td> <td style="border-right: 1px solid black;">PD, SN, SD, SC</td> <td style="border-right: 1px solid black;"> 192.168.1.254</td> </tr> <tr> <td style="border-right: 1px solid black;">gi3</td> <td style="border-right: 1px solid black;">RX,TX</td> <td style="border-right: 1px solid black;">PD, SN, SD, SC</td> <td style="border-right: 1px solid black;"> 192.168.1.254</td> </tr> </tbody> </table> <pre>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>	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	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																		

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	<p>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.</p>

Example This example sets port gi1 PVID TLV attaches status to disable and port gi2 to enable.

```
Switch(config)# interface gi1
Switch(config-if)# lldp tlv-select pvid disable
Switch(config-if)# interface gi2
Switch(config-if)# lldp tlv-select pvid enable

Switch# show lldp interfaces gi1,gi2

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
-----+-----+-----+-----
          |      |               |
          | RX,TX |               | 192.168.1.254
          |      |               |
          | RX,TX |               | 192.168.1.254

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
```

lldp tlv-select vlan-name

Syntax `lldp tlv-select vlan-name (add|remove) VLAN-LIST`

Parameter	add <i>VLAN-LIST</i>	Add VLAN list for LLDP 802.1 VLAN-NAME TLV on the specific interface. The configured ports should be member of all the specified VLANs or the VLAN-LIST is not valid.
------------------	-----------------------------	---

remove VLAN-LIST	Remove VLAN list of LLDP 802.1 VLAN-NAME TLV from interface.
-------------------------	--

Default	Default is no VLAN added.
----------------	---------------------------

Mode	Port Configuration
-------------	--------------------

Usage	Use “ lldp tlv-select vlan-name ” command to add or remove VLAN 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 gi10.
----------------	---

```
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 gi1
```

```
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
-----+-----+-----+-----
          | RX,TX |                | 192.168.1.2
```

```
Port ID: gi1
802.3 optional TLVs:
802.1 optional TLVs
PVID: Enabled
VLANs: 100
```

lldp tx

Syntax	lldp tx no lldp tx
---------------	-------------------------------------

Default	Default is enabled
----------------	--------------------

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 gi1 to enable LLDP TX, port gi2 to disable RX but enable TX, port gi3 to enable RX but disable TX, port gi4 to disable RX and TX.

```
Switch(config)# interface gi1
Switch(config-if)# lldp rx
Switch(config-if)# lldp tx
Switch(config)# interface gi2
Switch(config-if)# no lldp rx
Switch(config-if)# lldp tx
Switch(config)# interface gi3
Switch(config-if)# lldp rx
Switch(config-if)# no lldp tx
Switch(config)# interface gi4
Switch(config-if)# no lldp rx
Switch(config-if)# no lldp tx
Switch(config-if)# end
Switch# show lldp interfaces gi1-4
```

```
State: Enabled
Timer: 30 Seconds
Hold multiplier: 4
Reinit delay: 2 Seconds
Tx delay: 2 Seconds
LLDP packet handling: Bridging
```

Port	State	Optional TLVs	Address
gi1	RX, TX		192.168.1.254
gi2	TX		192.168.1.254
gi3	RX		192.168.1.254
gi4	Disable		192.168.1.254

lldp tx-delay

Syntax **lldp tx-delay** <1-8192>
no lldp tx-delay

Parameter <1-8192> Specify the LLDP tx delay in unit of seconds.

Default Default TX delay is 2 seconds

Mode Global Configuration

Usage Use “**lldp tx-delay**” command to configure the delay in seconds between successive LLDP frame transmissions. The delay starts to count in any case LLDP PDU is sent such as by LLDP PDU advertise routine, LLDP PDU content change, port link up, etc. The configuration could be shown by “**show lldp**” command.

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

Example This example sets LLDP PDU TX delay to 10 seconds.

```
Switch(config)# lldp tx-delay 10  
Switch# show lldp  
  
State: Disabled  
Timer: 10 Seconds  
Hold multiplier: 4  
Reinit delay: 2 Seconds  
Tx delay: 10 Seconds  
LLDP packet handling: Flooding
```

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**

```

State:
Disabled Timer:
30 Seconds
Hold multiplier: 4
Reinit delay: 2
Seconds Tx delay: 2
Seconds
LLDP packet handling: Flooding

Port      | State | Optional TLVs | Address
-----+-----+-----+-----
      gil | RX,TX | PD, SN, SD, SC |192.168.1.254
      gil | RX,TX |                  |192.168.1.254

Port ID: gil
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: gi2
802.3 optional TLVs:
802.1 optional TLVs
PVID: Enabled

```

show lldp local-device

Syntax	show lldp local-device show lldp interfaces <i>IF_NMLPORTS</i> local-device
Parameter	<i>IF_NMLPORTS</i> 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

LLDP Local Device Information:
Chassis Type : Mac Address Chassis
ID           : 00:12:12:12:12:12
System Name  : Switch121212
System Description :
System Capabilities Support : Bridge
System Capabilities Enable  : Bridge
Management Address : 192.168.1.254 (IPv4)
```

```
Switch121212(config)# show lldp interfaces gil local-device
```

```
Device ID: 00:12:12:12:12:12
Port ID: gil
System Name:
Switch121212
Capabilities: Bridge
System description:
Port description:
Management address:
192.168.1.254 Time To Live: 120
802.3 MAC/PHY Configur/Status
Auto-negotiation support:
Supported Auto-negotiation status:
Enabled
Auto-negotiation Advertised Capabilities: 10BASE-T
                                         half duplex, 10BASE-T
                                         full duplex, 100BASE-TX half duplex,
100BASE-TX full duplex
Operational MAU type: Other or unknown
802.3 Link Aggregation
Aggregation capability: Capable of being
aggregated Aggregation status: Not currently in
aggregation Aggregation port ID: 0
802.3 Maximum Frame Size: 1522
802.1 PVID: 1
LLDP-MED capabilities: Capabilities, Network Policy, Location,
Extended PSE, Inventory
LLDP-MED Device type: Network
Connectivity LLDP-MED Network policy
Application type: Voice
Signaling Flags: Unknown Policy
VLAN ID: 2
Layer 2 priority: 3
DSCP: 4
LLDP-MED Network policy
Application type:
Conferencing Flags: Unknown
Policy
VLAN ID: 5
Layer 2 priority: 1
DSCP: 63
Hardware revision: 1123
Firmware revision:
2.5.0-beta.32801 Software
revision: 2.5.0-beta.32801 Serial
number: abc
Manufacturer Name:
Model name:
RTL8328-24FE-4GE 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
```

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 display the LLDP MED information.

```
Switch# show lldp med

Fast Start Repeat Count: 10
lldp med network-policy voice: manual

Network policy 1
-----
Application type: Voice Signaling
VLAN ID: 2 tagged
Layer 2 priority: 3
DSCP: 4

Network policy 32
-----
Application type: Conferencing
VLAN ID: 5 tagged
Layer 2 priority: 1
DSCP: 63

Port   | Capabilities | Network Policy | Location |
Inventory
-----+-----+-----+-----+-----
--
    gi1 |           Yes |           Yes |       Yes |
Yes
    gi2 |           Yes |           Yes |       Yes |
Yes
    gi3 |           Yes |            No |       No  |
No
    gi4 |           Yes |            No |       No  |
No
    gi5 |            No |           Yes |       No  |
No
    gi6 |            No |           Yes |       No  |
No
    gi7 |            No |           Yes |       No  |
No
    gi8 |            No |           Yes |       No  |
No
    gi9 |           Yes |           Yes |       No  |
No
   gi10 |           Yes |           Yes |       No  |
No
   gi11 |           Yes |           Yes |       No  |
```

```

No
  gi12 |                Yes |                Yes |                No |
No
  gi13 |                Yes |                Yes |                No |
No
  gi14 |                Yes |                Yes |                No |
No
  gi15 |                Yes |                Yes |                No |
No
  gi16 |                Yes |                Yes |                No |
No
  gi17 |                Yes |                Yes |                No |
No
  gi18 |                Yes |                Yes |                No |
No
  gi19 |                Yes |                Yes |                No |
No
  gi20 |                Yes |                Yes |                No |
No
  gi21 |                Yes |                Yes |                No |
No
  gi22 |                Yes |                Yes |                No |
No
  gi23 |                Yes |                Yes |                No |
No
  gi24 |                Yes |                Yes |                No |
No
  gi25 |                Yes |                Yes |                No |
No
  gi26 |                Yes |                Yes |                No |
No
  gi27 |                Yes |                Yes |                No |
No
  gi28 |                Yes |                Yes |                No |
No

```

```
Switch# show lldp interfaces gil med
```

```

  Port   | Capabilities | Network Policy | Location
| Inventory
-----+-----+-----+-----+-----
--
      gil |           Yes |           Yes |           Yes |
Yes

```

```

Port ID: gil
Network policies: 1,
32 Location:
Coordinates: 112233445566778899AABBCCDDEEFF00
Civic-address: 112233445566
Ecs-elin:
112233445566778899AA

```

```
Switch121212(config)#
```

show lldp neighbor

Syntax

```

show lldp neighbor
show lldp interfaces IF_NMLPORTS neighbor

```

Parameter	<i>IF_NMLPORTS</i> 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	<p>This example displays the neighbor information.</p> <pre> Switch# show lldp neighbor Port Device ID Port ID SysName Capabilities TTL ---- + ----- + ----- + ----- -- + ----- + ----- gi3 00:12:12:12:12:12 gi1 Switch121212 Bridge 111 gi11 TREEBASE 00:1A:4D:26:EB:E8 TREEBASE Station Only 33 Switch121212(config)# show lldp interfaces gi3 neighbor Device ID: 00:12:12:12:12:12 Port ID: gi1 System Name: Switch121212 Capabilities: Bridge System description: Port description: Management address: 192.168.1.254 Time To Live: 98 802.3 MAC/PHY Configur/Status Auto-negotiation support: Supported Auto-negotiation status: Enabled Auto-negotiation Advertised Capabilities: 10BASE-T half duplex, 10BASE-T full duplex, 100BASE-TX half duplex, 100BASE-TX full duplex Operational MAU type: 100BASE-TX full duplex mode 802.3 Link Aggregation Aggregation capability: Capable of being aggregated Aggregation status: Not currently in aggregation Aggregation port ID: 0 802.3 Maximum Frame Size: 1522 802.1 PVID: 1 LLDP-MED capabilities: Capabilities, Network Policy, Location, Extended PSE, Inventory LLDP-MED Device type: Network Connectivity LLDP-MED Network policy Application type: Voice Signaling </pre>

```

Flags: Unknown
Policy VLAN ID: 2
Layer 2 priority: 3
DSCP: 4
LLDP-MED Network policy
Application type:
Conferencing Flags: Unknown
Policy
VLAN ID: 5
Layer 2 priority: 1
DSCP: 63
LLDP-MED Power over Ethernet
Device Type: Power Sourcing
Entity Power Source: Primary
Power Source Power priority: Low
Power value: 13.0
Watts Hardware
revision: 1123
Firmware                revision:
2.5.0-beta.32801         Software
revision: 2.5.0-beta.32801 Serial
number: abc
Manufacturer Name:
Model name:
RTL8328-24FE-4GE 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

```

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
```

```
LLDP Global Statistics:
```

```
Insertions : 3
```

```
Deletions  : 0
```

```
Drops      : 0
```

```
Age Outs   : 1
```

| TX Frames |

RX Frames

|

RX

TLVs		RX Ageouts				
Port	Total	Total	Discarded	Errors	Discarded	
Unrecognized	Total					
0	gi1	50	0	0	0	
0	gi2	0	0	0	0	
0	gi3	0	50	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	3377	10129	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	gi20	0	0	0	0	
0	gi21	0	0	0	0	
0	gi22	0	0	0	0	
0	gi23	0	0	0	0	
0	gi24	0	0	0	0	
0	gi25	3377	0	0	0	
0	gi26	3377	0	0	0	
0	gi27	0	0	0	0	
0	gi28	0	0	0	0	
0		0				

```
Switch121212(config)# show lldp interfaces gil statistics
```

```
LLDP Port Statistics:
```

Port	TX Frames Total	TX Frames Unrecognized	Total	RX Frames Total	RX Frames Discarded	Errors	RX TLVs Discarded	RX Age
gil	51	0	0	0	0	0	0	

show lldp tlv-overloading

Syntax

```
show lldp interfaces IF_NMLPORTS tlv-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 gil.

```
Switch# show lldp interfaces gil tlv-overloading
```

```
gil:
```

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 POE	9	Transmitted
802.3	30	Transmitted
Optional	38	Transmitted
LLDP-MED Inventory	97	Transmitted
802.1	8	Transmitted

Total: 285 bytes
Left: 1203 bytes

Example

The following example shows the global logging configuration.

```
Switch# show logging

Logging service is
enabled
```

```

  TARGET | STATUS | Server (PORT) | FACILITY | LOG LEV
-----+-----+-----+-----+-----
buffered | enabled |                |          |
|emerg, alert, crit, error, warning, notice
console | enabled |                |          |
|emerg, alert, crit, error, warning, notice
```

The following table describes the significant fields shown in the example:

Field	Description
TARGET	The destinations where the logging messages are stored.
STATUS	The status of logging destinations.
Server (PORT)	Server address and port number for the remote logging.
FACILITY	The facility of the log messages.
LOG LEVEL	The severity level of the log messages.

The following example shows the log messages stored in the RAM.

```
Switch# show logging buffered

                          Log messages in buffered

NO.|  Timestamp  | Category | Severity | Message
-----+-----+-----+-----+-----
  1|Jan 01 2000 08:14:47|          | AAA| notice|
New console connection for user admin, source async
ACCEPTED
  2|Jan 01 2000 08:03:12|          | AAA| notice|
New console connection for user admin, source async
ACCEPTED
  3|Jan 01 2000 08:01:13| System| notice|
System Startup!
  4|Jan 01 2000 08:01:13| System| notice|
Logging is enabled
```

The following table describes the significant fields shown in the example:

Field	Description
NO	The number of log entry.
Timestamp	Time when the message was generated.
Category	The category of the message.

Severity	The severity level of the messages.
----------	-------------------------------------

	Message	The message content.
--	---------	----------------------

14. Logging

clear logging

Syntax	clear logging (buffered file)				
Parameter	<table border="1"> <tr> <td>buffered</td> <td>Clear the log messages stored in the RAM.</td> </tr> <tr> <td>file</td> <td>Clear the log messages stored in the Flash.</td> </tr> </table>	buffered	Clear the log messages stored in the RAM.	file	Clear the log messages stored in the Flash.
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	<p>The following example clear the log messages stored in RAM and Flash.</p> <pre>Switch# clear logging buffered Switch# clear logging file</pre>				

logging

Syntax	logging no logging
Parameter	N/A
Default	Logging service is enabled.
Mode	Global Configuration
Usage	<p>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.</p> <p>The status of global logging server is available from the command show</p>

logging in the Privileged EXEC mode. When the logging service is enabled, logging on and off at each destination rule can be individually configured by the command **logging console**, **logging buffered**, **logging file**, and **logging host** in the Global Configuration mode. If the logging service is disabled, no messages will be sent to these destinations.

Example

The following example disables and enables the logging service on the switch.

```
Switch(config)# no logging  
Switch(config)# logging
```

logging host

Syntax

logging host (*ip-addr|hostname*) [**facility** *facility*] [**port** *port*] [**severity** *sev*]
no logging host (*ip-addr|hostname*)

Parameter

<i>ipv4-addr</i>	IPv4 address of the remote logging server.
<i>hostname</i>	Hostname of the remote logging server.
facility <i>facility</i>	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 <i>port</i>	Specify the port number of the remote logging server. The valid range is from 0 to 65535, and the default value is 512.
severity <i>sev</i>	Specify the minimum severity of the logging messages. The valid range is from 0 to 7, and the number 0 to 7 represents emerg, alert, critical, error, warning, notice, info, and debug individually. The default value of minimum severity level is 5 (emerg, alert, crit, error, warning, notice).

Default

No remote logging destination is configured.

Mode

Global Configuration

Usage

To define the logging server, use the command **logging host** to add the remote logging server in the Global Configuration mode. Otherwise, use the command **no logging host** to remove the remote logging rules.

For the host name configuration, logging service would try translating the host name to IP address directly. Add the logging host would be failed on the failure of host name translating.

Example

The following example adds the remote logging rules by IP and Hostname.

```
Switch(config)# logging host 1.2.3.4
Switch(config)# logging host SYSLOG
```

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 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 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
```

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 Preileged 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

Logging service is

enabled

  TARGET | STATUS | Server (PORT) | FACILITY | LOG LEVEL
-----+-----+-----+-----+-----
buffered | enabled |                |          |
|emerg, alert, crit, error, warning, notice
console | enabled |                |          |
|emerg, alert, crit, error, warning, notice
```

The following table describes the significant fields shown in the example:

Field	Description
TARGET	The destinations where the logging messages are stored.
STATUS	The status of logging destinations.
Server (PORT)	Server address and port number for the remote logging.
FACILITY	The facility of the log messages.
LOG LEVEL	The severity level of the log messages.

The following example shows the log messages stored in the RAM.

```
Switch# show logging buffered

                Log messages in buffered

NO.| Timestamp | Category | Severity | Message
-----+-----+-----+-----+-----
  1|Jan 01 2000 08:14:47|                | AAA| notice|
New console connection for user admin, source async
ACCEPTED
  2|Jan 01 2000 08:03:12|                | AAA| notice|
New console connection for user admin, source async
ACCEPTED
  3|Jan 01 2000 08:01:13|                | System| notice|
System Startup!
  4|Jan 01 2000 08:01:13|                | System| notice|
Logging is enabled
```

The following table describes the significant fields shown in the example:

Field	Description
-------	-------------

NO	The number of log entry.
----	--------------------------

Timestamp	Time when the message was generated.
Category	The category of the message.
Severity	The severity level of the messages.
Message	The message content.

15. MAC Address Table

clear mac address-table

Syntax	clear mac address-table dynamic [interfaces <i>IF_PORTS</i> vlan <i>vlan-id</i>]	
Parameter	interfaces <i>IF_PORTS</i>	Delete all dynamic addresses learned on the specific interface.
	vlan <i>vlan-id</i>	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	

mac address-table aging-time

Syntax	mac access-table aging-time <i>seconds</i>	
Parameter	<i>seconds</i>	The time in seconds that an entry remains in the MAC address table. Its valid range is from 10 to 630 seconds, and the default value is 300 seconds.
Default	The default aging time is 300 seconds.	

Mode	Global Configuration
Usage	To set the aging time of the MAC address table, use the command mac address-table aging-time in the Global Configuration mode.
Example	The following example set the aging time to 500 seconds. <pre>Switch(config)# mac address-table aging-time 500</pre>

mac address-table static

Syntax	mac address-table static <i>mac-addr</i> vlan <i>vlan-id</i> interfaces <i>IF_PORTS</i> mac address-table static <i>mac-addr</i> vlan <i>vlan-id</i> drop no mac address-table static <i>mac-addr</i> vlan <i>vlan-id</i>								
Parameter	<table border="1"> <tr> <td><i>mac-addr</i></td> <td>MAC address.</td> </tr> <tr> <td>vlan <i>vlan-id</i></td> <td>Specify the VLAN ID for the interface.</td> </tr> <tr> <td>Interface <i>IF_PORTS</i></td> <td>Specify the interface ID or a list of interface IDs.</td> </tr> <tr> <td>drop</td> <td>Drop the packets with the specified source or destination unicast MAC address.</td> </tr> </table>	<i>mac-addr</i>	MAC address.	vlan <i>vlan-id</i>	Specify the VLAN ID for the interface.	Interface <i>IF_PORTS</i>	Specify the interface ID or a list of interface IDs.	drop	Drop the packets with the specified source or destination unicast MAC address.
<i>mac-addr</i>	MAC address.								
vlan <i>vlan-id</i>	Specify the VLAN ID for the interface.								
Interface <i>IF_PORTS</i>	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. <pre>Switch# mac address-table static 00:11:22:33:44:55 vlan 1 interfaces fa5</pre> The following example adds a rule of unicast address filtering into MAC address table. <pre>Switch# mac address-table static 00:11:22:33:44:55 vlan 1 drop</pre>								

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 <i>IF_PORTS</i>		Display the MAC addresses entries for a specific interface.
vlan <i>vlan-id</i>		Display the MAC address entries for a specific VLAN.
<i>mac-addr</i>		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 | DE:AD:BE:EF:01:02 | Management | CPU
1 | 00:01:02:03:04:05 | Static | All
100 | 00:11:22:33:44:55 | Static | gi1
1 | 1C:E6:C7:8F:10:02 | Dynamic | fa3
1 | AA:BB:CC:DD:EE:FF | Static | All
1 | DE:AD:BE:EF:01:0C | Dynamic | gi1

Total number of entries: 6
Switch#
```

The following example displays the static MAC address configuration for the interface fa1.

```
Switch# show mac address-table static interfaces fa1 VID
| MAC Address | Type | Ports
-----+-----+-----+-----
-
1 | 00:01:02:03:04:05 | Filtering | All
1 | AA:BB:CC:DD:EE:FF | Filtering | All

Total number of entries: 2
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 100
VID | MAC Address | Type | Ports
-----+-----+-----+-----
 100 | 00:11:22:33:44:55 | Static | gi1

Total number of entries: 1
```

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
Total number of entries: 5
```

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
Mac Address Table aging time: 300 sec
```

16. MAC VLAN

vlan mac-vlan group (Global)

Syntax **vlan mac-vlan group** <1- 2147483647> *mac-address* **mask** <9-48>
no vlan mac-vlan group *mac-address* **mask** <9-48>

<Parameter	<1-2147483647>	Specify the group ID
	<i>Mac-address</i>	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
```

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	<p>Use the “vlan mac-vlan group” to create mapping of group and VLAN ID of an interface.</p> <p>Use the no form of this command to delete mapping.</p>
Example	<p>The following example shows how to mapping group id 333 to VLAN 100 on interface fa1.</p> <pre>Switch(config)# Interface fa1 Switch(config-if) # vlan mac-vlan group 333 VLAN 100</pre>

show vlan mac-vlan groups

Syntax	show vlan mac-vlan groups
Default	N/A
Mode	Privileged EXEC
Usage	Use the show vlan mac-vlan groups command to display mac groups configuration
Example	<p>This following example shows how to display mac group.</p> <pre>Switch# show vlan mac-vlan groups Mac Address Mask Group Id ----- 22:33:44:55:66:77 48 222 44:55:66:77:88:99 48 333 88:99:00:aa:bb:cc 40 444 88:99:00:ab:bb:10 48 111</pre>

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	<p>The following example shows how to display the MAC-Based VLAN interfaces setting</p> <pre>Switch# show vlan mac-vlan interfaces fa1 Port fa1 : Mac based VLANs: Group ID Vlan ID ----- 333 444 444 1</pre>

17. Management ACL

management access-list

Syntax	management access-list NAME no management access-list NAME
Parameter	NAME The name of management ACL
Default	No management ACL is configured.
Mode	Global Configuration

Usage Use the **management access-list** command to create a management access list and to enter management access-list configuration mode. The name of ACL must be unique that cannot have same name with other management ACL. Use the no form of this command to delete

Example The following example shows how to add a management ACL with name “test”

```
Switch(config)# management access-list test
```

management access-class

Syntax **management access-class** NAME
no management access-class

Parameter	NAME	The name of management ACL to be used.
------------------	------	--

Default Default is no management ACL restrictions

Mode Global Configuration

Usage Use the **management access-class** command to activate a management ACL. Use the no form of this command to delete

Example The following example shows how to add a management ACL with name “test”

```
Switch(config)# management access-list test
```

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 <i>IF_PORTS</i>	Specify the interface ID or a list of interface IDs.
	ip A.B.C.D/A.B.C.D	Specify the source IP address and mask of packet.
	ipv6 X:X::X:X/<0-128>	Specify the source IPv6 address and prefix length of packet.
	(all http https snmp ssh telnet)	Specify the type of services.

Default No rules are configured.

Mode Management Access-List Configuration

Usage Use the deny command to add deny rules that drop those packets hit the rule.

Example The following example shows how to add a deny rule to drop all types of services packets that source ip is 1.1.1.1 from interface gi1.

```
Switch(config)# management access-list test
Switch(config-macl)# sequence 1 deny ip
1.1.1.1/255.255.255.255 interfaces gi1 service all
```

permit

Syntax

```
[sequence <1-65535>] permit interfaces IF_PORTS service
(all|http|https|snmp|ssh|telnet)
[sequence <1-65535>] permit ip A.B.C.D/A.B.C.D interfaces IF_PORTS
service (all|http|https|snmp|ssh|telnet)
[sequence <1-65535>] permit 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 <i>IF_PORTS</i>	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 permit rules that bypass those packets hit the rule.
Example	<p>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.</p> <pre>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</pre>

no sequence

Syntax	no sequence <1-65535>		
Parameter	<table border="1" style="width: 100%;"> <tr> <td style="width: 30%;"><1-65535></td> <td>Specify sequence index of ACL entry to delete.</td> </tr> </table>	<1-65535>	Specify sequence index of ACL entry to delete.
<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	<p>The following example shows how to delete an entry.</p> <pre>Switch(config)# management access-list test Switch(config-macl)# sequence 10 deny interfaces gi1 service all Switch(config-macl)# no sequence 10</pre>		

show management access-class

Syntax	show management access-class
Parameter	

Default	No default is defined
Mode	Privileged EXEC
Usage	Use the show management access-class command to show the active management access-list.
Example	<hr/> The example shows how to show management access-class Switch# show management access-class Management access-class is enabled, using access-list test <hr/>

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	<hr/> The example shows how to show management access-list Switch#Switch# show management access-list 1 management access-list is created test ---- sequence 1 deny ip 1.1.1.1/255.255.255.255 interfaces gi1 service all ! (Note: all other access implicitly denied) <hr/>

18. Mirror

mirror session destination interface

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	<i><1-4></i>	Specify the mirror session to configure
	<i>IF_NMLPORT</i>	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 fa1.

```
Switch(config)# mirror session 1 destination interface fa1
Switch# show mirror session 1
Session 1 Configuration Source
RX Port          : fa2-5
Source TX Port   : fa2-5
Destination port  : fa1
Ingress State: disabled
```

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	<i><1-4></i>	Specify the mirror session to configure
	<i>IF_PORTS</i>	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	<p>Use the “mirror session source interface” command to start a port mirror session.</p> <p>Use the no form of this command to stop a port mirroring session.</p> <p>Use the “no mirror session” command to disable all mirror sessions or specific mirror session.</p>

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 fa2-5 both  
Switch(config)# mirror session 1 destination interface fa1  
Switch(config)# show mirror session 1  
Session 1 Configuration  
Source RX Port      : fa2-5  
Source TX Port      : fa2-5  
Destination port    : fa1  
Ingress State: disabled
```

show mirror

Syntax **show mirror [session <1-4>]**

Parameter	<1-4>	Specify the mirror session to display
------------------	-------	---------------------------------------

Default N/A

Mode Privileged EXEC

Usage Use the **show mirror** command to display mirror session configuration

Example This following example shows how to display mirror session configuration

```
Switch(config)# show mirror  
Session 1 Configuration  
Source RX Port      : fa2-5  
Source TX Port      : fa2-5  
Destination port    : fa1
```

```
Ingress State: disabled

Session 2 Configuration
Mirrored source   : Not
Config Destination port :
Not Config

Session 3 Configuration
Mirrored source   : Not
Config Destination port :
Not Config

Session 4 Configuration
Mirrored source   : Not
Config
Destination port   : Not Config
```

19. MLD Snooping

ipv6 mld snooping

Syntax	ipv6 mld snooping no ipv6 mld snooping
Parameter	None
Default	Default is disabled
Mode	Global Configuration
Usage	Use the ipv6 mld snooping command to enable MLD snooping function. Use the no form of this command to disable. Disable will clear all ipv6 mld snooping dynamic group and dynamic router port, and make the static ipv6 mld group invalid. No more dynamic group and router port by mld message will be learned. You can verify settings by the show ipv6 mld snooping command.
Example	The following example specifies that set ipv6 mld snooping test. Switch(config)# ipv6 mld snooping

ipv6 mld snooping report-suppression

Syntax

**ipv6 mld snooping report-suppression
no ipv6 mld snooping report-suppression**

Parameter	none
Default	Default is enabled
Mode	Global Configuration
Usage	Use the ipv6 mld snooping report-suppression command to enable MLD 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 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

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 set ipv6 mld snooping version 2. Switch(config)# ipv6 mld snooping version 2

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	<p>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.</p> <p>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.</p>	
Example	<p>The following example specifies that set ipv6 mld unknown multicast action router-port test.</p> <pre>Switch(config)# ipv6 mld snooping unknown-multicast action router-port</pre>	

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	<p>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.</p> <p>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.</p>	

Example The following example specifies that set ipv6 mld snooping vlan test.
Switch(config)# **ipv6 mld snooping vlan 1**

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

Default

```

no ipv6 mld snooping vlan 1-4094 last-member-query-count
no ipv6 mld snooping vlan 1-4094 last-member-query-interval
ipv6 mld snooping vlan 1-4094 router learn pim-dvmrp
no ipv6 mld snooping vlan 1-4094 fastleave
no ipv6 mld snooping vlan 1-4094 query-interval
no ipv6 mld snooping vlan 1-4094 response-time
no ipv6 mld snooping vlan 1-4094 robustness-variable

```

Mode Global Configuration

Usage

'no ipv6 mld snooping vlan 1 (last-member-query-count | last-member-query-interval | query-interval | response-time | robustness-variable)' will set the vlan parameters to default.

The cli setting will change the ipv6 mld vlan parameters admin settings. The configure can use 'show ipv6 mld snooping vlan 1'.

Example

The following example specifies that set ipv6 mld snooping vlan parameters test.

```
Switch(config)# ipv6 mld snooping vlan 1 fastleave
Switch(config)# ipv6 mld snooping vlan 1 last-member-query-count 5
Switch(config)# ipv6 mld snooping vlan 1 last-member-query-interval 3
Switch(config)# ipv6 mld snooping vlan 1 query-interval 100
Switch(config)# ipv6 mld snooping vlan 1 response-time 12
Switch(config)# ipv6 mld snooping vlan 1 robustness-variable 4 Switch#
show ipv6 mld snooping vlan 1
MLD Snooping is globaly enabled
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 last immediate leave: enabled
MLD Snooping automatic learning of multicast router ports: enabled
```

ipv6 mld snooping vlan fastleave

Syntax

ipv6 mld snooping vlan <VLAN-LIST> fastleave
no ipv6 mld snooping vlan <VLAN-LIST> fastleave

Parameter

VLAN-LIST specifies VLAN ID list to set

Default

Default is disabled

Mode

Global Configuration

Usage

Use the **ipv6 mld snooping vlan fastleave** command to enable fastleave function. Group will remove port immediately when receive leave packet. Use the **no** form of this command to disable. You can verify settings by the **show ipv6 mld snooping vlan** command

Example

The following example specifies that set ipv6 mld snooping vlan fastleave test.

```
Switch(config)# ipv6 mld snooping vlan 1 fastleave
```

ipv6 mld snooping vlan last-member-query-count

Syntax	ipv6 mld snooping vlan <VLAN-LIST> last-member-query-count <1-7> no ipv6 mld snooping vlan <VLAN-LIST> last-member-query-count
Parameter	VLAN-LIST specifies VLAN ID list to set last-member-query-count <1-7> specifies last member query count to set
Default	Default is 2
Mode	Global Configuration
Usage	Use the ipv6 mld snooping vlan last-member-query-count command to change how many query packets will send. Use the no form of this command to restore to default. You can verify settings by the show ipv6 mld snooping vlan command
Example	The following example specifies that set ipv6 mld snooping vlan last-member-query-count test. Switch(config)# ipv6 mld snooping vlan 1 last-member-query-count 5

ipv6 mld snooping vlan last-member-query-interval

Syntax	ipv6 mld snooping vlan <VLAN-LIST> last-member-query-interval <1-60> no ipv6 mld snooping vlan <VLAN-LIST> last-member-query-interval
Parameter	VLAN-LIST specifies VLAN ID list to set last-member-query-interval <1-60> specifies last member query interval to set
Default	Default is 1
Mode	Global Configuration
Usage	Use the ipv6 mld snooping vlan last-member-query-interval command to set interval between each query packet. Use the no form of this command to restore to default

You can verify settings by the **show ipv6 mld snooping vlan** command

Example

The following example specifies that set **ipv6 mld snooping vlan last-member-query-interval** test.
Switch(config)# **ipv6 mld snooping vlan 1 last-member-query-interval 3**

ipv6 mld snooping vlan query-interval

Syntax

ipv6 mld snooping vlan <VLAN-LIST> query-interval <30-18000>
no ipv6 mld snooping vlan <VLAN-LIST> query-interval

Parameter

VLAN-LIST	specifies VLAN ID list to set
query-interval <30-18000>	specifies query interval to set

Default

Default is 125

Mode

Global Configuration

Usage

Use the **ipv6 mld snooping vlan query-interval** command to set interval between each query.
Use the **no** form of this command to restore to default
You can verify settings by the **show ipv6 mld snooping vlan** command

Example

The following example specifies that set **ipv6 mld snooping vlan query-interval** test.
Switch(config)# **ipv6 mld snooping vlan 1 query-interval 100**

ipv6 mld snooping vlan response-time

Syntax

ipv6 mld snooping vlan <VLAN-LIST> response-time <5-20>
no ipv6 mld snooping vlan <VLAN-LIST> response-time

Parameter

VLAN-LIST	specifies VLAN ID list to set
response-time <5-20>	specifies a response time to set

Default	Default is 10
Mode	Global Configuration
Usage	Use the ipv6 mld snooping vlan response-time command to set response time. Use the no form of this command to restore to default. You can verify settings by the show ipv6 mld snooping vlan command
Example	The following example specifies that set ipv6 mld snooping vlan response-time test. Switch(config)# ipv6 mld snooping vlan 1 response-time 12

ipv6 mld snooping vlan robustness-variable

Syntax	ipv6 mld snooping vlan <VLAN-LIST> robustness-variable <1-7> no ipv6 mld snooping vlan <VLAN-LIST> robustness-variable
Parameter	VLAN-LIST specifies VLAN ID list to set robustness-variable specifies a robustness value to set <1-7>
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

ipv6 mld snooping vlan router

Syntax	ipv6 mld snooping vlan VLAN-LIST router learn pim-dvmrp no ipv6 mld snooping vlan VLAN-LIST router learn pim-dvmrp
---------------	---

Parameter	VLAN-LIST specifies VLAN ID list to set
Default	Default is enabled
Mode	Global Configuration
Usage	Use the ipv6 mld snooping vlan router command to enable learning router port by routing protocol packets such as PIM/PIMv2, DVMRP, MOSPF. Use the no form of this command to disable. You can verify settings by the show ipv6 mld snooping vlan command
Example	The following example specifies that set ipv6 mld snooping vlan router test. Switch(config)# ipv6 mld snooping vlan 99 router

ipv6 mld snooping vlan static-port

Syntax	ipv6 mld snooping vlan <VLAN-LIST> static-port IF_PORTS no ipv6 mld snooping vlan <VLAN-LIST> static-port IF_PORTS
Parameter	VLAN-LIST specifies VLAN ID list to set IF_PORTS specifies a port list to set or remove
Default	No static port by default
Mode	Global Configuration
Usage	Use the ipv6 mld snooping vlan static-port command to add static forwarding port, all known vlan 1 ipv6 group will add the static ports. Use the no form of this command to delete static port. You can verify settings by the show ipv6 mld snooping forward-all command.
Example	The following example specifies that set ipv6 mld snooping static port test. Switch(config)# ipv6 mld snooping vlan 1 static -port gi1-2

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	<table border="1"> <tr> <td>VLAN-LIST</td> <td>specifies VLAN ID list to set</td> </tr> <tr> <td>IF_PORTS</td> <td>specifies a port list to set or remove</td> </tr> </table>	VLAN-LIST	specifies VLAN ID list to set	IF_PORTS	specifies a port list to set or remove
VLAN-LIST	specifies VLAN ID list to set				
IF_PORTS	specifies a port list to set or remove				
Default	No forbidden router ports by default				
Mode	Global Configuration				
Usage	Use the ipv6 mld snooping vlan forbidden-router-port command to add static forbidden router port. This will also remove port from static router port. The forbidden router port will not forward received query packet. Use the no form of this command to delete forbidden router port. You can verify settings by the show ipv6 mld snooping router command.				
Example	The following example specifies that set ipv6 mld snooping forbidden test. Switch(config)# ipv6 mld snooping vlan 1 forbidden-router-port gi2				

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	<table border="1"> <tr> <td>VLAN-LIST</td> <td>specifies VLAN ID list to set</td> </tr> <tr> <td>IF_PORTS</td> <td>specifies a port list to set or remove</td> </tr> </table>	VLAN-LIST	specifies VLAN ID list to set	IF_PORTS	specifies a port list to set or remove
VLAN-LIST	specifies VLAN ID list to set				
IF_PORTS	specifies a port list to set or remove				
Default	No forbidden router ports by default				
Mode	Global Configuration				

Usage Use the **ipv6 mld snooping vlan forbidden-router-port** command to add static forbidden router port. This will also remove port from static router port. The forbidden router port will not forward received query packet.
Use the **no** form of this command to delete forbidden router port.
You can verify settings by the **show ipv6 mld snooping router** command.

Example The following example specifies that set ipv6 mld snooping forbidden test.
Switch(config)# **ipv6 mld snooping vlan 1 forbidden-router-port gi2**

ipv6 mld snooping vlan static router port

Syntax **ipv6 mld snooping vlan <VLAN-LIST> static-router-port IF_PORTS**
no ipv6 mld snooping vlan <VLAN-LIST> static-router-port IF_PORTS

Parameter	VLAN-LIST	specifies VLAN ID list to set
	IF_PORTS	specifies a port list to set or remove

Default None static router ports by default

Mode Global Configuration

Usage Use the **ipv6 mld snooping vlan static-router-port** command to add static router port. All query packets will forward to this port.
Use the **no** form of this command to delete static router port.
You can verify settings by the **show ipv6 mld snooping router** command..

Example The following example specifies that set ipv6 mld snooping static test.
Switch(config)# **ipv6 mld snooping vlan 1 static-router-port gi1-2**

ipv6 mld snooping vlan static-group

Syntax **ipv6 mld snooping vlan <VLAN-LIST> static-group [<ipv6-addr>]**
interfaces IF_PORTS
no ipv6 mld snooping vlan <VLAN-LIST> static-group <ipv6-addr>
interfaces IF_PORTS

Parameter	VLAN-LIST	specifies VLAN ID list to set
	Ipv6-addr	specifies multicast group ipv4 address

IF_PORTS	specifies port list to set or remove
----------	--------------------------------------

Default	No static group by default
----------------	----------------------------

Mode	Global Configuration
-------------	----------------------

Usage	Use the ipv6 mld snooping vlan static-group command to add a static group. The static group will not learn other dynamic ports. If the dynamic group exists, then the static group will overlap the dynamic group. The static group set to valid unless igmp snooping global and vlan enable.
--------------	--

Use the **no** form of this command to delete a port in static group. If remove the last member of static group, the static group will be delete.

You can verify settings by the **show ipv6 mld snooping group** command.

Example	The following example specifies that set ipv6 mld snooping static group test. Switch(config)# ipv6 mld snooping vlan 1 static-group ff13::1 interfaces gi1-2
----------------	--

ipv6 mld snooping vlan group

Syntax	no ipv6 mld snooping vlan <VLAN-LIST> group <ipv6-addr>
---------------	--

Parameter	VLAN-LIST	specifies VLAN ID list to set
	ipv6-addr	specifies multicast group ipv6 address

Default	None
----------------	------

Mode	Global Configuration
-------------	----------------------

Usage	Use the no ipv6 mld snooping vlan group command to delete a group which could be static or dynamic. You can verify settings by the show ipv6 mld snooping group command.
--------------	---

Example	The following example specifies that set ip igmp snooping static group test. Switch(config)# no ip igmp snooping vlan 1 group ff13::1
----------------	---

profile range

Syntax `profile range ipv6 <ipv6-addr> [ipv6-addr] action (permit | deny)`

<ipv6-addr>	Start ipv6 multicast address
[ipv6-addr]	End ipv6 multicast address
(permit deny)	Permit: allow Multicast address range ip address learning deny: do not allow Multicast address range ip address learning

Default None

Mode mld profile configuration mode

Usage Use the **profile** command to generate MLD profile.
You can verify settings by the **show ipv6 mld profile** command

Example The following example specifies that set ipv6 mld profile test.
Switch(config)# **ipv6 mld profile 1**
Switch(config-mld-profile)# **profile range ipv6 ff13::1 ff13::10 action permit**

ipv6 mld profile

Syntax `ipv6 mld profile <1-128>`
`no ipv6 mld profile <1-128>`

Parameter <1-128> 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

ipv6 mld filter

Syntax	ipv6 mld filter <1-128> no ipv6 mld filter
Parameter	<1-128> specifies profile ID [interfaces IF_PORTS] Specifies interfaces to display
Default	None
Mode	Port Configuration
Usage	Use the ipv6 mld filter command to bind a profile for port. When the port bind a profile. Then the port learning group will update, if the group is not match the profile rule it will remove the port from the group. Static group is excluded. Use the no form of this command to delete profile You can verify settings by the show ipv6 mld filter command
Example	The following example specifies that set ipv6 mld filter test. Switch(config)# interface gi1 Switch(config-if)# ipv6 mld filter 1

ipv6 mld max-groups

Syntax	ipv6 mld max-groups <0-1024> no ipv6 mld max-groups
---------------	--

Parameter	<0-1024> specifies profile ID
Default	Default is 1024
Mode	Port Configuration
Usage	<p>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.</p> <p>Use the no form of this command to restore to default You can verify settings by the show ipv6 mld max-groups command.</p>
Example	<p>The following example specifies that set ipv6 mld max-groups test.</p> <pre>Switch(config)# interface gi1 Switch(config-if)# ipv6 mld max-groups 10</pre>

ip igmp max-groups action

Syntax	ipv6 mld max-groups action (deny replace)
Parameter	<p>(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.</p>
Default	Default action is deny
Mode	Interface mode
Usage	<p>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.</p>
Example	<p>The following example specifies that set action replace test.</p> <pre>Switch(config-if)#ipv6 mld max-groups action replace</pre>

clear ipv6 mld snooping groups

Syntax	clear ipv6 mld snooping groups [(dynamic static)]
Parameter	None Clear ipv6 mld groups include dynamic and static (dynamic static) ipv6 mld group type is dynamic or static
Default	None
Mode	Privileged EXEC
Usage	This command will clear the ipv6 mld groups for dynamic or static or all of type. You can verify settings by the show ipv6 mld snooping groups command..
Example	The following example specifies that clear ipv6 mld snooping groups test. Switch# clear ipv6 mld snooping groups static

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

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 Total ipv6 mld snooping group number: 2

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 <table border="1"> <thead> <tr> <th>VLAN</th> <th>Group IP Address</th> <th>Type</th> <th>Life(Sec)</th> <th>Port</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>ff13::1</td> <td>Static</td> <td>--</td> <td>fa1</td> </tr> <tr> <td>1</td> <td>ff13::2</td> <td>Static</td> <td>--</td> <td>fa2</td> </tr> </tbody> </table>	VLAN	Group IP Address	Type	Life(Sec)	Port	1	ff13::1	Static	--	fa1	1	ff13::2	Static	--	fa2
VLAN	Group IP Address	Type	Life(Sec)	Port												
1	ff13::1	Static	--	fa1												
1	ff13::2	Static	--	fa2												

Total Number of Entry = 2

show ipv6 mld snooping router

Syntax	show ipv6 mld snooping router [(dynamic forbidden static)]	
Parameter	none	Show ipv6 mld router include dynamic and static and forbidden
	(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	<p>The following example specifies that show ipv6 mld snooping router test.</p> <pre>Switch# show ipv6 mld snooping router Dynamic Router Table VID Port Expiry Time(Sec) -----+-----+----- Total Entry 0 Static Router Table VID Port Mask -----+----- 1 fa5 Total Entry 1 Forbidden Router Table VID Port Mask -----+----- Total Entry 0</pre>	

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	<p>The following example specifies that show ipv6 mld snooping test.</p> <pre>Switch# show ipv6 mld snooping MLD Snooping Status ----- Snooping : Disabled Report Suppression : Enabled Operation Version : v1 Forward Method : mac Unknown 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</pre>

show ipv6 mld snooping vlan

Syntax	show ipv6 mld snooping vlan [VLAN-LIST]				
Parameter	<table border="1"> <tr> <td>none</td> <td>Show all ipv6 mld snooping vlan info</td> </tr> <tr> <td>[VLAN-LIST]</td> <td>Show specifies vlan ipv6 mld snooping info</td> </tr> </table>	none	Show all ipv6 mld snooping vlan info	[VLAN-LIST]	Show specifies vlan ipv6 mld snooping info
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	<p>The following example specifies that show ipv6 mld snooping vlan test.</p> <pre>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 last immediate leave: disabled MLD Snooping automatic learning of multicast router ports: enabled</pre>				

show ipv6 mld snooping forward-all

Syntax	show ipv6 mld snooping forward-all [vlan VLAN-LIST]				
Parameter	<table border="1"> <tr> <td>none</td> <td>Show all ipv6 mld snooping vlan forward-all info</td> </tr> <tr> <td>[vlan VLAN-LIST]</td> <td>Show specifies vlan of ipv6 mld forward info.</td> </tr> </table>	none	Show all ipv6 mld snooping vlan forward-all info	[vlan VLAN-LIST]	Show specifies vlan of ipv6 mld forward info.
none	Show all ipv6 mld snooping vlan forward-all info				
[vlan VLAN-LIST]	Show specifies vlan of ipv6 mld forward info.				
Default	Show all vlan ipv6 mld forward all info				
Mode	Privileged EXEC				
Usage	This command will display ipv6 mld snooping forward all info.				

Example	The following example specifies that show ipv6 mld snooping forward-all test. Switch# show ipv6 mld snooping forward-all MLD Snooping VLAN 1 MLD Snooping static port : None MLD Snooping forbidden port : None
----------------	--

show ipv6 mld profile

Syntax	show ipv6 mld profile [<1-128>]				
Parameter	<table border="1"> <tr> <td>none</td> <td>Show all ipv6 mld snooping profile info</td> </tr> <tr> <td>[<1-128>]</td> <td>Show specifies index profile info</td> </tr> </table>	none	Show all ipv6 mld snooping profile info	[<1-128>]	Show specifies index profile info
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 IPv6 mld profile index: 1 IPv6 mld profile action: permit Range low ip: ff13::1 Range high ip: ff13::10
----------------	--

show ipv6 mld filter

Syntax	show ipv6 mld filter [interfaces IF_PORTS]				
Parameter	<table border="1"> <tr> <td>none</td> <td>Show all port filter</td> </tr> <tr> <td>[interfaces IF_PORTS]</td> <td>Show specifies ports filter</td> </tr> </table>	none	Show all port filter	[interfaces IF_PORTS]	Show specifies ports filter
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**
 Port ID | Profile ID
 -----+-----
 gi1 : 1
 gi2 : None
 gi3 : None
 gi4 : None
 gi5 : None
 --More--

show ipv6 mld max-group

Syntax **show ipv6 mld max-group [interfaces IF_PORTS]**

Parameter	Description
none	Show all port max-group
[interfaces IF_PORTS]	Show specifies ports max-group

Default None

Mode Privileged EXEC

Usage This command will display ipv6 mld port max-group.

Example The following example specifies that show ipv6 mld max-group test.
 Switch(config-if)# **ipv6 mld max-groups 50**
 Switch# **show ipv6 mld max-group**
 Port ID | Max Group
 -----+-----
 gi1 : 50
 gi2 : 256
 gi3 : 256
 gi4 : 256
 gi5 : 256
 --More--

show ipv6 mld port max-group action

Syntax	show ipv6 mld max-group action [interfaces IF_PORTS]				
Parameter	<table border="1"> <tr> <td>none</td> <td>Show all port max-group action</td> </tr> <tr> <td>[interfaces IF_PORTS]</td> <td>Show specifies ports max-group action</td> </tr> </table>	none	Show all port max-group action	[interfaces IF_PORTS]	Show specifies ports max-group action
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	<p>The following example specifies that show ipv6 mld max-group action test.</p> <pre>Switch(config-if)# ipv6 mld max-groups action replace Switch# show ipv6 mld max-group action Port ID Max-groups Action -----+----- gi1 : replace gi2 : deny gi3 : deny gi4 : deny gi5 : deny --More--</pre>				

20. MVR

mvr

Syntax	mvr no mvr
Parameter	None
Default	Default is disabled
Mode	Global Configuration

Usage Use the **mvr** command to enable MVR function. The command will clear all mvr VLAN ID multicast snooping group.
Use the **no** form of this command to disable. Disable will clear all mvr group.
You can verify settings by the **show mvr** command.

Example The following example specifies that set **mvr** test.
Switch(config)# **mvr**
Switch(config)# **no mvr**
Switch# **show mvr**
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

mvr vlan

Syntax **mvr vlan <VLAN-ID>**

Parameter	<VLAN-ID>	The exist static vlan id
-----------	-----------	--------------------------

Default Default mvr vlan id is 1

Mode Global Configuration

Usage Use the **mvr vlan** command to modify mvr vlan id when the mvr status is enabled.
Change mvr vlan id will delete the old mvr vlan and new mvr vlan group. If there have configure source or receiver port, there will check the source must only in the mvr vlan , and receiver port must not in the mvr vlan member.
You can verify settings by the **show mvr** command.

Example The following example specifies that configure mvr vlan 2 test.
Switch(config)# **vlan 2**
Switch(config)# **mvr**
The operation will delete groups of VLAN ID is MVR VLAN include static groups. Continue? [yes/no]:y
Switch(config)# **mvr vlan 2**
The operation will delete the old and new MVR VLAN groups include static MVR groups.Continue? [yes/no]:y

mvr group

```
Switch# 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
```

mvr group <ip-address> [<1-128>]

< ip-address>	Start MVR IP multicast address
[<1-128>]	Contiguous series of IP addresses.

Default None

Mode Global Configuration

Usage Use the **mvr group** command to configure mvr group address range when mvr is enabled. The command will delete all mvr vlan ipv4 group entry You can verify settings by the **show mvr** command

Example

```
The following example specifies that set mvr group range is 224.1.1.1 ~ 224.1.1.8 test.
Switch(config)# mvr
Switch(config)# mvr group 224.1.1.1 8
The operation will delete the MVR VLAN groups include static MVR groups.Continue? [yes/no]:y
Switch# show mvr
MVR Running : Enabled
MVR Multicast VLAN : 2
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
```

mvr mode

Syntax **mvr mode (dynamic | compatible)**

Parameter (dynamic|compatible) dynamic: Allows dynamic MVR membership on

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source ports
compatible: does not support IGMP dynamic joins
on source ports.

Default Default is compatible.

Mode Global Configuration

Usage Use the **mvr mode** command to change mvr mode when mvr is enabled.
You can verify settings by the **show mvr** command.

Example The following example specifies that set mvr mode dynamic test.

```
Switch(config)#mvr
Switch(config)#mvr mode dynamic
Switch# show mvr
MVR Running : Enabled
MVR Multicast VLAN : 2
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
```

mvr query-time

Syntax **mvr query-time <1-10>**
no mvr query-time

Parameter <1-10> specifies query response time is 1~10 sec.

Default Default is 1 sec

Mode Global Configuration

Usage Use the **mvr query-time** command to configure when mvr is enabled.
Use the **no** form of this command to set query-time default value. You can verify settings by the **show mvr** command.

Example The following example specifies that set mvr query-time 10 sec test.

```
Switch(config)# mvr
```

```
Switch(config)# mvr query-time 10
Switch# show mvr
MVR Running :
Enabled MVR
Multicast VLAN : 2
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
```

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 fa1 is source port , fa2 is receiver port test.

```
Switch(config)# vlan 2  
Switch(config-vlan)#exit  
Switch(config)#mvr  
Switch(config)#mvr vlan 2
```

```

Switch(config)#mvr group 224.1.1.1 8
Switch(config)# interface gi1
Switch(config-if)# switchport trunk allowed vlan 2
Switch(config-if)# mvr type
source Switch(config-if)#exit
Switch(config)# interface gi2
Switch(config-if)# switchport mode
access Switch(config-if)#mvr type
receiver Switch# show mvr interface
Port | Type | Immediate Leave
-----+-----+-----
gi1  | Source| Disabled
gi2  | Receiver| Disabled

```

mvr port immediate

Syntax	mvr immediate no mvr immediate
Parameter	None
Default	Default is disabled
Mode	Port Configuration
Usage	<p>Use the mvr immediate command to configure mvr support immediate leave when mvr is enabled.</p> <p>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</p>

Example

The following example specifies that set gi2 immediate enable test. The configure should configure mvr receiver port firstly.(eg. mvr port type)

```
Switch(config)# interface gi2
```

```
Switch(config-if)#mvr immediate
```

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

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

```
Switch# show mvr interface
```

```
Port | Type | Immediate Leave
```

```
-----+-----+-----
```

```
gi1 | Source| Disabled
```

```
gi2 | Receiver| Enabled
```

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	Value	Description
VLAN-ID		specifies MVR VLAN ID for static group
ip-addr		specifies multicast MVR group address
IF_PORTS		specifies port list to set or remove

Default None

Mode Global Configuration

Usage Use the **mvr vlan group** command to add a static group or configure static group member ports when mvr is enabled. This command applies to only receiver ports. In compatible mode, this command applies to only receiver ports. In dynamic mode, it applies to receiver ports and source ports. When remove static mvr group all ports, the static group will be delete. Or can use **no ip igmp vlan VLAN-ID group** to delete the mvr static group. Static group can't learn dynamic port by igmp memesage. Use the **no** form of this command to delete a port in static group. If remove the last member of static group, the static group will be delete.

You can verify settings by the **show mvr members** command.

Example The following example specifies that set mvr static group test. The configure must configure mvr receiver port firstly.(eg. mvr port type)
Switch(config)# **mvr vlan 2 group 224.1.1.1 interfaces gi2**
Switch# **show mvr members**

```

Gourp IP Address | Type | Life(Sec) | Port
-----+-----+-----+-----
      224.1.1.1 | Static|    --    | gi2
  
```

Total Number of Entry = 1

clear mvr members

Syntax `clear mvr members [dynamic|static]`

Parameter	Value	Description
	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
----------------	---

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
----------------	---

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

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 MVR Running : Enabled MVR Multicast VLAN : 100 MVR Group Range : 224.1.1.1 ~ 224.1.1.128 MVR Max Multicast Groups : 128 MVR Current Multicast Groups : 0 MVR Global query response time : 1 sec MVR Mode : compatible

21. Port

back-pressure

Syntax	back-pressure no back-pressure
Parameter	
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	<hr/> <p>This example shows how to configure port fa1 and fa2 to be protected port.</p> <pre>Switch(config)# interface fa1 Switch(config-if)# no back-pressure</pre> <p>This example shows how to show current jumbo-frame size</p> <pre>Switch# show running-config interface fa1 interface fa1 no back-pressure</pre> <hr/>

clear interface

Syntax	clear interfaces <i>IF_PORTS</i> counters
Parameter	<i>IF_PORTS</i> Specify port to clear counters.
Default	No default value for this command.
Mode	Privileged EXEC
Usage	Use “ clear interface ” command to clear statistic counters on specific ports.

Example

This example shows how to clear counters on port fa1.
Switch(config)# **clear interfaces fa1 counters**

This example shows how to show current counters

```
Switch# show interfaces fa1
Hardware is Fast Ethernet
Auto-duplex, Auto-speed, media type is Copper
flow-control is off
 0 packets input, 0 bytes, 0 throttles
Received 0 broadcasts (0 multicasts)
 0 runts, 0 giants, 0 throttles
 0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
 0 multicast, 0 pause input
 0 input packets with dribble condition detected
 0 packets output, 0 bytes, 0 underrun
 0 output errors, 0 collisions, 0 interface resets
 0 babbles, 0 late collision, 0 deferred
 0 PAUSE output
```

description

Syntax

description *WORD*<1-32>
no description

Parameter

WORD<1-32> Specify port description string.

Default

Default port description is empty.

Mode

Interface Configuration

Usage

Use “**description**” command to give the port a name to identify it easily.

If description includes space character, please use double quoted to wrap

it. Use **no** form to restore description to empty string.

Example

This example shows how to modify port descriptions.

```
Switch(config)# interface fa1
Switch(config-if)# description userport
Switch(config-if)# exit
Switch(config)# interface fa2
Switch(config-if)# description "uplink port"
```

This example shows how to show current port description on interface fa1 and fa2

```
Switch# show interfaces fa1-2 status
Port Name Status Vlan Duplex Speed
```

Type					
fa1	userport	notconnect	1	auto	auto
Copper					
fa2	uplink port	notconnect	1	auto	auto
Copper					

duplex

Syntax

duplex (auto | full | half)

Parameter

auto	Specify port duplex to auto negotiation.
full	Specify port duplex to force full duplex.
half	Specify port duplex to force half duplex.

Default

Default port duplex is auto.

Mode

Interface Configuration

Usage

Use “**duplex**” command to change port duplex configuration.

Example

This example shows how to modify port duplex configuration.

```
Switch(config)# interface fa1
Switch(config-if)# duplex full
Switch(config-if)# exit
Switch(config)# interface fa2
Switch(config-if)# duplex half
```

This example shows how to show current speed configuration

```
Switch# show running-config interfaces fa1-2
interface fa1
 duplex full
interface fa2
 duplex half
```

This example shows how to show current interface link speed

```
Switch# show interfaces fa1-2 status
Port Name           Status      Vlan Duplex Speed  Type
fa1                  connected  1    full  a-100M Copper
fa2                  connected  1    half  a-100M Copper
```

eee

Syntax

eee
no eee

Parameter

Default Default eee state is disabled.

Mode Interface Configuration

Usage Use “**eee**” command to make port to enable the energy efficient Ethernet feature.

Use **no** form of this command to disable eee.

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

Example This example shows how to configure port fa1 and fa2 to be protected port.

```
Switch(config)# interface fa1  
Switch(config-if)# eee
```

This example shows how to show current jumbo-frame size

```
Switch# show running-config interface fa1  
interface fa1  
    eee
```

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 fa1  
Switch(config-if)# flowcontrol on
```

This example shows how to show current flow control configuration

```
Switch# show interfaces fa1  
Hardware is Fast Ethernet  
Full-duplex, Auto-speed, media type is Copper  
flow-control is on  
 0 packets input, 0 bytes, 0 throttles  
Received 0 broadcasts (0 multicasts)  
 0 runs, 0 giants, 0 throttles  
 0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored  
 0 multicast, 0 pause input  
 0 input packets with dribble condition detected  
379 packets output, 31981 bytes, 0 underrun  
 0 output errors, 0 collisions, 0 interface resets  
 0 babbles, 0 late collision, 0 deferred  
 0 PAUSE output
```

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  
jumbo-frame 9216
```

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 gil Switch(config-if)# media-type rj45

protected

Syntax	protected no protected
Default	Default protected state is no protected.
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 Port Protected State -----+----- fa1 enabled

```
fa2 |enabled
```

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# show interfaces fa1
Hardware is Fast Ethernet
Auto-duplex, Auto-speed, media type is Copper
flow-control is off
 0 packets input, 0 bytes, 0 throttles
Received 0 broadcasts (0 multicasts)
 0 runs, 0 giants, 0 throttles
 0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
 0 multicast, 0 pause input
 0 input packets with dribble condition detected
 0 packets output, 0 bytes, 0 underrun
 0 output errors, 0 collisions, 0 interface resets
 0 babbles, 0 late collision, 0 deferred
 0 PAUSE output
```

This example shows how to show current protected port state.

```
Switch# show interfaces fa1-2 protected
Port      | Protected State
-----+-----
    fa1 | enabled
    fa2 | enabled
```

This example shows how to show current port status

```
Switch# show interfaces fa1-2 status
Port Name          Status      Vlan Duplex Speed  Type
fa1                 connected   1    full  a-100M Copper
```

speed

Syntax

speed (10 | 100 | 1000)
speed auto [(10 | 100 | 1000 | 10/100)]

speed nonnegotiate
no speed nonnegotiate

Parameter

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 (nonnegotiate) 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 fa1
Switch(config-if)# speed 100
Switch(config-if)# exit
Switch(config)# interface fa2
Switch(config-if)# speed auto 10/100
```

This example shows how to show current speed configuration

```
Switch# show running-config interfaces fa1-2
interface fa1
  speed 100
interface fa2
  speed auto 10/100
```

This example shows how to show current interface link speed

```
Switch# show interfaces fa1-2 status
```

Port	Name	Status	Vlan	Duplex	Speed	Type
------	------	--------	------	--------	-------	------

fa1	connected	1	a-full	a-100M	Copper
fa2	connected	1	a-full	a-100M	Copper

shutdown

Syntax

shutdown
no shutdown

Parameter

Default

Default port admin state is no shutdown.

Mode

Interface Configuration

Usage

Use “**shutdown**” command to disable port and use “**no shutdown**” to enable port. If port is error disabled by some reason, use “no shutdown” command can also recovery the port manually.

Example

This example shows how to modify port duplex configuration.

```
Switch(config)# interface fa1
Switch(config-if)# shutdown
```

This example shows how to show current admin state configuration

```
Switch# show running-config interfaces fa1
interface fa1
  shutdown
```

This example shows how to show current link status

Port	Name	Status	Vlan	Duplex	Speed	Type
fa1		disable	1	full	auto	Copper

22. Port Error Disable

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.

```
Switch(config)# errdisable recovery cause bpduguard
Switch(config)# errdisable recovery cause selfloop
```

errdisable recovery interval

Syntax **errdisable recovery interval** *seconds*

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

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	<p>The following example shows the error disable configuration, and the interfaces in the error disabled state.</p> <pre>Switch# show errdisable recovery ErrDisable Reason Timer Status -----+----- bpduguard enabled selfloop enabled broadcast-flood disabled unknown-multicast-flood disabled unicast-flood disabled acl disabled psecure-violation disabled dhcp-rate-limit disabled arp-inspection disabled Timer Interval : 60 seconds</pre>

Interfaces that will be enabled at the next timeout:

Port	Error Disable Reason	Time Left
-----+	-----+	-----+

23. Port Security

port-security (Global)

Syntax	port-security no port-security
Parameter	None
Default	Default is disabled
Mode	Global Configuration
Usage	The “ port-security ” command enables the port security functionality globally. Use the no form of this command to disable. You can verify settings by the show port-security command.
Example	The following example shows how to enable port security switch(config)# port-security switch# show port-security port-security is: Enabled

port-security (Interface)

Syntax	port-security no port-security
Parameter	None
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 fa1

```
switch(config)# interface fa1
switch(config-if)# port-security
switch(config)# show port-security interfaces fa1
Port | Security | CurrentAddr | Action
-----+-----+-----+-----
fa1 | Enabled ( 1) | 0 | Discard
```

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.

```
switch(config)# interface fa1
switch(config-if)# port-security address-limit 10 action discard
switch(config-if)# port-security
switch(config)# show port-security interfaces fa1
```

Port	Mode	Security	CurrentAddr	Action
fa1	Dynamic	Enabled (10)	0	Discard

show port-security

Syntax `show port-security`

Parameter None

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**
port-security is: Enabled

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 fa1.

```
Switch# show port-security interfaces fa1
Port | Security | CurrentAddr | Action
-----+-----+-----+-----
fa1 | Enabled ( 10) | 0 | Discard
```

24. Protocol VLAN

vlan protocol-vlan group (Global)

Syntax **vlan protocol-vlan group** <1-8> **frame-type**
(ethernet_ii|llc_other|snap_1042) **protocol-value** VALUE
no vlan protocol-vlan group <1-8>

Parameter	<1-8>	Specify protocol vlan group to configure
	(ethernet_ii llc_other snap_1042)	Specify protocol based frame type
	VALUE	Specify protocol value to configure

Default no protocol vlan group are configured

Mode Global Configuration

Usage Use the **vlan protocol-vlan group** Global Configuration mode command to add protocol vlan group with spefied proto type and value.
Use the **no** form of this command to remove protocol vlan group setting.
You can verify your setting by entering the **show vlan proto-vlan Privileged EXEC** command

Example The following example show how to configure protocol vlan group:
Switch(config)# **vlan protocol-vlan group 1 frame-type ethernet_ii protocol-value 0x806**
Switch(config)# **vlan protocol-vlan group 2 frame-type llc_other protocol-value 0x800**

```
Switch# show vlan protocol-vlan
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 | -- | --
```

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 fa1 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 fa1 Port fa1 : Group 1 Status : Enabled VLAN ID : 2 Group 2 Status : Enabled VLAN ID : 3 Group 3 Status : Disabled Group 4 Status : Disabled Group 5 Status : Disabled Group 6 Status : Disabled Group 7 Status : Disabled Group 8 Status : Disabled

show vlan protocol-vlan

Syntax	show vlan protocol-vlan [group <1-8>]																																				
Parameter	<1-8> Specify protocol vlan group to display																																				
Default	N/A																																				
Mode	Privileged EXEC																																				
Usage	Use the show vlan proto-vlan command in EXEC mode to display Proto VLAN group configuration																																				
Example	<p>The following example how to display Proto VLAN group configuration</p> <pre>Switch# show vlan protocol-vlan</pre> <table border="1"> <thead> <tr> <th>Group ID</th> <th>Status</th> <th>Type</th> <th>value</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Enabled</td> <td>Ethernet</td> <td>0x0806</td> </tr> <tr> <td>2</td> <td>Enabled</td> <td>LLC other</td> <td>0x0800</td> </tr> <tr> <td>3</td> <td>Disabled</td> <td>--</td> <td>--</td> </tr> <tr> <td>4</td> <td>Disabled</td> <td>--</td> <td>--</td> </tr> <tr> <td>5</td> <td>Disabled</td> <td>--</td> <td>--</td> </tr> <tr> <td>6</td> <td>Disabled</td> <td>--</td> <td>--</td> </tr> <tr> <td>7</td> <td>Disabled</td> <td>--</td> <td>--</td> </tr> <tr> <td>8</td> <td>Disabled</td> <td>--</td> <td>--</td> </tr> </tbody> </table>	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	--	--
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	--	--																																		

show vlan protocol-vlan interfaces

Syntax	show vlan protocol-vlan interfaces IF_PORTS
Parameter	IF_PORTS Specify interfaces protocol vlan to display
Default	N/A
Mode	Privileged EXEC

Usage Use the **show vlan protocol-vlan interface** command in EXEC mode to display the Protocol VLAN interfaces setting

Example The following example shows how to display the Protocol VLAN interfaces setting

```
Switch# show vlan protocol-vlan interfaces fa1
Port fa1 :
  Group 1
    Status   : Enabled
    VLAN ID  : 2
  Group 2
    Status   : Enabled
    VLAN ID  : 3
  Group 3
    Status   : Disabled
  Group 4
    Status   : Disabled
  Group 5
    Status   : Disabled
  Group 6
    Status   : Disabled
  Group 7
    Status   : Disabled
  Group 8
    Status   : Disabled
```

25. QoS

qos

Syntax **qos**
no qos

Default Default qos is disabled.

Mode Global Configuration

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

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	<p>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.</p> <p>Use “qos cos” command to assign port default cos value.</p>
--------------	---

Example	<p>This example shows how to configure default cos value 7 on interface fa1.</p> <pre>Switch(config)# interface GigabitEthernet 1 Switch(config-if)# qos cos 7 Switch(config-if)# end Switch# show qos interface GigabitEthernet 1</pre> <table border="1" style="width: 100%; border-collapse: collapse; font-family: monospace;"> <thead> <tr> <th style="text-align: left;">Port</th> <th style="text-align: left;">CoS</th> <th style="text-align: left;">Trust State</th> <th style="text-align: left;">Remark Cos</th> <th style="text-align: left;">Remark DSCP</th> <th style="text-align: left;">Remark IP Prec</th> </tr> </thead> <tbody> <tr> <td>gi1</td> <td>7</td> <td>enabled</td> <td>disabled</td> <td>disabled</td> <td>disabled</td> </tr> </tbody> </table>	Port	CoS	Trust State	Remark Cos	Remark DSCP	Remark IP Prec	gi1	7	enabled	disabled	disabled	disabled
Port	CoS	Trust State	Remark Cos	Remark DSCP	Remark IP Prec								
gi1	7	enabled	disabled	disabled	disabled								

qos map

Syntax	<p>qos map (cos-queue dscp-queue precedence-queue) <i>SEQUENCE</i> to <1-8></p> <p>qos map (queue-cos queue-precedence) <i>SEQUENCE</i> to <0-7></p> <p>qos map queue-dscp <i>SEQUENCE</i> to <0-63></p>
---------------	---

Parameter	cos-queue Configure or show CoS to queue map
	dscp-queue Configure or show DSCP to queue map
	precedence-queue Configure or show IP Precedence to queue map.
	queue-cos Configure or show queue to CoS map

queue-dscp	Configure or show queue to DSCP map
queue-precedence	Configure or show queue to IP Precedence map
SEQUENCE	Specify the cos, dscp, precedence or queue with one or multiple values.
<1-8>	Specify th queue id
<0-7>	Specify the cos or precedence values
<0-63>	Specify the dscp values

Default

The default values of cos-queue are showing in the following table.

CoS	Queue ID
0	2
1	1
2	3
3	4
4	5
5	6
6	7
7	8

The default values of dscp-queue are showing in the following table.

DSCP	Queue ID
0~7	1
8~15	2
16~23	3
24~31	4
32~39	5
40~47	6
48~55	7
56~63	8

The default values of ip precedence are showing in the following table.

IP Precedence	Queue ID
0	1
1	2
2	3
3	4
4	5
5	6
6	7
7	8

The default values of queue-cos are showing in the following table.

Queue ID	CoS
1	1
2	0
3	2
4	3
5	4
6	5

7	6
8	7

The default values of queue-dscp are showing in the following table.

Queue ID	DSCP
1	0
2	8
3	16
4	24
5	32
6	40
7	48
8	56

The default values of queue-precedence are showing in the following table.

Queue ID	IP Precedence
1	0
2	1
3	2
4	3
5	4
6	5
7	6
8	7

Mode

Global Configuration

Usage

According to different trust type, packets will be assigned to different queue based on the specific qos map. For example, if the trust type is trust cos, the device will get the cos value in packet and reference the cos-queue mapping to assign the correct queue.

The queue to cos, dscp or precedence maps are used by remarking function. If the port remarking feature is enabled, the remarking function will reference these 3 tables to remark packets.

Example

This example shows how to map cos 6 and 7 to queue 1.

```
Switch(config)# qos map cos-queue 6 7 to 1 Switch#
show qos map cos-queue
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
Queue to CoS mappings
```

Queue	1	2	3	4	5	6	7	8
<hr/>								
-- CoS1	0	2	7	7	5	6	7	

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
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
```

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.

```
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
```

Port	CoS	Trust State	Remark Cos	Remark DSCP	Remark IP Prec
g1/1	0	enabled	enabled	enabled	enabled

qos trust

Syntax `qos trust (cos | cos-dscp | dscp | precedence)`

Parameter	cos	Specify the device to trust CoS
	cos-dscp	Specify the device to trust DSCP for IP packets, and trust CoS for non-IP packets.
	dscp	Specify the device to trust DSCP
	precedence	Specify the device to trust IP Precedence

Default Default QoS trust type is cos.

Mode Global Configuration

Usage In QoS basic mode, there are 4 trust types for device to judge the appropriate queue of the packets. This command is able to switch between these trust types.

CoS:

IEEE 802.1p defined 3bits priority value in vlan tag. Trust this value in packets and assign queue according to cos-queue map.

DSCP:

IETF RFC2474 defined 6bits priority value in IP packet (highest 6bits in ToS field). Trust this value in packets and assign queue according to dscp-queue map.

IP Precedence:

The highest 3bits priority value in IP packet ToS field. Trust this value in packets and assign queue according to precedence-queue map.

CoS-DSCP:

Trust DSCP for IP packets and assign queue according to dscp-queue map. Trust CoS for non-IP packets and assign queue according to cos-queue map.

Example This example shows how to change qos basic mode trust types.

```
Switch(config)# qos trust cos
Switch(config)# qos trust cos-dscp
Switch(config)# qos trust dscp
Switch(config)# qos trust precedence
```

This example shows how to check current qos trust type.

```
Switch# show qos
QoS Mode: basic
Basic trust: ip-precedence
```

qos trust (Interface)

Syntax `qos trust`

no qos trust

Parameter

Default Default interface qos trust state is enabled.

Mode Interface Configuration

Usage After QoS function is enabled in basic mode, the device also support per interface enable/disable the qos function. If the trust state on interface is enabled, all ingress packets of this interface will remap according to the trust type and the qos maps. Otherwise, all ingress packets will assign to queue 1.

Use “**qos trust**” to enable trust state on interface and use “**no qos trust**” to disable trust state on interface.

Example

This example shows how to disable qos trust state on interface fa1.

```
Switch(config)# interface GigabitEthernet 1
Switch(config-if)# no qos trust
Switch(config-if)# end
Switch# show qos interface GigabitEthernet 1
  Port | CoS | Trust State | Remark Cos | Remark DSCP | Remark IP Prec
-----+-----+-----+-----+-----+-----
   gi1 |  0  | disabled  | disabled  | disabled  | disabled  |
```

show qos

Syntax

show qos

Parameter

Default No default value for this command.

Mode Privileged EXEC

Usage Use “**show qos**” command to show qos state and trust type.

Example

This example shows how to check current qos mode.

```
Switch# show qos
QoS Mode: basic
Basic trust: cos
```

show qos interface

Syntax	show qos interface <i>IF_PORTS</i>
Parameter	<i>IF_PORTS</i> 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	<p>This example shows how to show qos configurations on interface fa1.</p> <pre>Switch# show qos interface GigabitEthernet 1 Port CoS Trust State Remark Cos Remark DSCP Remark IP Prec -----+-----+-----+-----+-----+----- gil 7 enabled disabled disabled disabled </pre>

show qos map

Syntax	show qos map [(cos-queue dscp-queue precedence-queue queue-cos queue-dscp queue-precedence)]												
Parameter	<table border="1"> <tr> <td>cos-queue</td> <td>Show CoS to queue map.</td> </tr> <tr> <td>dscp-queue</td> <td>Show DSCP to queue map.</td> </tr> <tr> <td>precedence-queue</td> <td>Show IP Precedence to queue</td> </tr> <tr> <td>map. queue-cos</td> <td>Show queue to CoS map.</td> </tr> <tr> <td>queue-dscp</td> <td>Show queue to DSCP map.</td> </tr> <tr> <td>queue-precedence</td> <td>Show queue to IP Precedence map.</td> </tr> </table>	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.
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
```

```
CoS to Queue mappings
```

```
  COS    0  1  2  3  4  5  6  7
```

```
-----
```

```
Queue   2  1  3  4  5  6  7  8
```

```
DSCP to Queue mappings
```

```
d1: d2  0  1  2  3  4  5  6  7  8  9
```

```
-----
```

```
0:      1  1  1  1  1  1  1  1  2  2
```

```
1:      2  2  2  2  2  2  3  3  3  3
```

```
2:      3  3  3  3  4  4  4  4  4  4
```

```
3:      4  4  5  5  5  5  5  5  5  5
```

```
4:      6  6  6  6  6  6  6  6  7  7
```

```
5:      7  7  7  7  7  7  8  8  8  8
```

```
6:      8  8  8  8
```

```
IP Precedence to Queue mappings
```

```
IP Precedence  0  1  2  3  4  5  6  7
```

```
-----
```

```
Queue         1  2  3  4  5  6  7  8
```

```
Queue to CoS mappings
```

```
Queue   1  2  3  4  5  6  7  8
```

```
-----
```

```
CoS     1  0  2  3  4  5  6  7
```

```
Queue to DSCP mappings
```

```
Queue   1  2  3  4  5  6  7  8
```

```
-----
```

```
DSCP   0  8 16 24 32 40 48 56
```

```
Queue to IP Precedence mappings
```

```
Queue   1  2  3  4  5  6  7  8
```

```
-----
```

```
ipprec  0  1  2  3  4  5  6  7
```

show qos queueing

Syntax

```
show qos queueing
```

Parameter

Default

No default value for this command.

Mode

Privileged EXEC

Usage

Use “**show qos queueing**” command to show qos queueing information.

Example	<p>This example shows how to check current qos queueing information.</p> <pre>Switch# show qos queueing qid-weights Ef - Priority 1 - 3 dis- N/A 2 - 5 dis- N/A 3 - N/A ena- 3 4 - N/A ena- 4 5 - N/A ena- 5 6 - N/A ena- 6 7 - N/A ena- 7 8 - N/A ena- 8</pre>
----------------	--

26. Rate Limit

rate limit egress

Syntax	<pre>rate-limit egress <16-1000000> no rate-limit egress</pre>
Parameter	<p><16-1000000> Specify the committed information rate.</p>
Default	<p>Default rate limit is disabled.</p>
Mode	<p>Interface configuration</p>
Usage	<p>Use the “rate-limit egress” command to configure the egress port shaper.</p> <p>Use the no form of this command to disable the shaper.</p> <p>You can verify your setting by entering the show running-config interfaces command.</p>
Example	<p>The following example show how to configure ingress port rate limit and egress port shaper.</p> <pre>Switch(config)# interfaces gil Switch(config-if)# rate-limit egress 2048 Switch# show running-config interfaces gil interface gil rate-limit egress 2048</pre>

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. Switch(config)# interfaces gil Switch(config-if)# rate-limit egress queue 3 2048 Switch# show running-config interfaces gil interface gil rate-limit egress queue 3 2048

rate limit ingress

Syntax	rate-limit ingress <16-1000000> no rate-limit ingress
Parameter	<16-1000000> Specify the ingress limit rate <1-8> Specify the egress shaper queue number
Default	Rate limiting is disabled.
Mode	Interface configuration
Usage	Use the “ rate-limit ingress ” command to limit the incoming traffic rate on a port.

Use the **no** form of this command to disable the rate limit.

You can verify your setting by entering the **show running-config interfaces** command

Example

The following example show how to configure ingress port rate limit.

```
Switch(config)# interfaces gil
Switch(config-if)# rate-limit ingress 128
Switch# show running-config interfaces gil
interface gil
  rate-limit ingress 128
```

27. RMON

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.

```
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
```

```
switch(config)# rmon event 1 log description test owner admin
switch(config)# show rmon event 1
Rmon Event Index      1
Rmon Event Type      : Log
Rmon Event Community :
public Rmon Event
Description : test Rmon Event
Last Sent :
Rmon Event Owner      : admin
```

rmon alarm

Syntax **rmon alarm <1-65535> interface IF_PORT (drop-events|octets|pkts|broadcast-pkts|multicast-pkts|crc-align-errors|undersize-pkts|oversize-pkts|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	<p>The example shows how to add RMON alarm entry that sample interface fa 1 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.</p> <pre>switch(config)# rmon event 1 log switch(config)# rmon event 2 log</pre> <p>Switch(config)# rmon alarm 1 interface gi1 pkts 300 delta rising 10000 1 falling 100 1 startup rising-falling owner admin</p> <pre>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</pre>

rmon history

Syntax	<pre>rmon history <1-65535> interface IF_PORT [buckets <1-65535>] [interval <1-3600>] [owner NAME] no rmon history <1-65535></pre>										
Parameter	<table border="1"> <tr> <td style="border-top: 1px solid black; border-bottom: 1px solid black;"><1-65535></td> <td>Specify history index to create or modify.</td> </tr> <tr> <td style="border-top: 1px solid black; border-bottom: 1px solid black;">IF_PORT</td> <td>Specify the interface to sample</td> </tr> <tr> <td style="border-top: 1px solid black; border-bottom: 1px solid black;">[bucket <1-65535>]</td> <td>(Optional) Specify the maximum number of buckets.</td> </tr> <tr> <td style="border-top: 1px solid black; border-bottom: 1px solid black;">[interval <>1-3600]</td> <td>(Optional) Specify time interval for each sample</td> </tr> <tr> <td style="border-top: 1px solid black; border-bottom: 1px solid black;">[owner NAME]</td> <td>(Optional)Specify owner of history</td> </tr> </table>	<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
<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	<p>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.</p> <pre>switch(config)# rmon history 1 interface gi1 interval 60 owner admin 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 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>

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
===== Port gi1 =====
etherStatsDropEvents      0
etherStatsOctets          0
etherStatsPkts            0
etherStatsBroadcastPkts  0
etherStatsMulticastPkts  0
etherStatsCRCAlignErrors 0
etherStatsUnderSizePkts  0
etherStatsOverSizePkts   0
etherStatsFragments      0
etherStatsJabbers        0
etherStatsCollisions     0
etherStatsPkts64Octets   0
etherStatsPkts65to127Octets 0
etherStatsPkts128to255Octets 0
etherStatsPkts256to511Octets 0
etherStatsPkts512to1023Octets 0
etherStatsPkts1024to1518Octets 0
```

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.

```
switch(config)# show rmon interfaces gi1 statistics
===== Port gi1 =====
etherStatsDropEvents      0
etherStatsOctets          : 81882
```

```

etherStatsPkts          578
etherStatsBroadcastPkts 10
etherStatsMulticastPkts 0
etherStatsCRCAlignErrors 0
etherStatsUnderSizePkts 0
etherStatsOverSizePkts 0
etherStatsFragments    0
etherStatsJabbers      0
etherStatsCollisions    0
etherStatsPkts64Octets 355
etherStatsPkts65to127Octets 126
etherStatsPkts128to255Octets 0
etherStatsPkts256to511Octets 42
etherStatsPkts512to1023Octets 55
etherStatsPkts1024to1518Octets 0

```

show rmon event

Syntax

show rmon event (<1-65535> | all)

Parameter

<1-65535>	specifies event index to show
all	Show all existed event

Default

No default is defined

Mode

Privileged EXEC

Usage

Use the **show rmon event** command to show existed RMON event entry.

Example

The example shows how to show rmon event entry.

```

switch(config)# rmon event 1 log trap public description test owner admin
switch(config)# show rmon event 1
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

```

show rmon event log

Syntax	show rmon event <1-65535> log
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	<p>The example shows how to show rmon event log.</p> <pre>switch(config)# show rmon event 1 log ===== Index 1 Alarm Index 1 Action : Startup Falling Time : (32918334) 3 days, 19:26:23.34 Description : fa1.Pkts=0 <= 100</pre>

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	<p>The example shows how to show rmon alarm entry.</p> <pre>Switch(config)# rmon alarm 1 interface gi1 pkts 300 delta rising 10000 1 falling 100 1 startup rising-falling owner admin</pre> <pre>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</pre>
----------------	---

show rmon history

Syntax	show rmon history (<1-65535> all)				
Parameter	<table border="1"> <tr> <td><1-65535></td> <td>specifies history index to show</td> </tr> <tr> <td>all</td> <td>Show all existed history</td> </tr> </table>	<1-65535>	specifies history index to show	all	Show all existed history
<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	<p>The example shows how to show RMON history entry.</p> <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>				

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	<p>The example shows how to show RMON history statistics</p> <pre>switch(config)# show rmon history 1 statistics ===== Sample Index 2 Interval Start : (32940466) 3 days, 19:30:04.66 DropEvents 0 Octets : 117226 Pkts 763 BroadcastPkts 9 MulticastPkts 0 CRCAAlignErrors 0 UnderSizePkts 0 OverSizePkts 0 Fragments 0 Jabbers 0 Collisions 0 Utilization 1 ===== Sample Index 1 Interval Start : (32939462) 3 days, 19:29:54.62 DropEvents 0 Octets 220 Pkts 3 BroadcastPkts 1 MulticastPkts 0 CRCAAlignErrors 0 UnderSizePkts 0 OverSizePkts 0 Fragments 0</pre>

Jabbers	: 0
Collisions	: 0
Utilization	: 0

28. SNMP

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
SNMP is disabled.
```

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.
	<pre>Switch# show snmp community Community Name Group Name View Access ----- private all ro all public all rw</pre>
	Total Entries: 2

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.
	<pre>Switch# show snmp engineid Local SNMPV3 Engine id: 00036d001122 IP address Remote SNMP engineID ----- 192.168.1.11 00036D10000A</pre>
	Total Entries: 1

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	<p>The following example shows the SNMP group configuration.</p> <pre>Switch# show snmp group Group Name Model Level ReadView WriteView Not ----- private v2c noauth all all --- v3 v3 auth all all all</pre> <p>Total Entries: 2</p>

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	<p>The following example shows the configuration of SNMP notification recipients on the switch.</p> <pre>Switch# show snmp host Server Community Name Notification Version Notification Type ----- 192.168.1.11 private v1 trap</pre> <p>Total Entries: 1</p>

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	<p>The following example shows the status of SNMP traps.</p> <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>

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	<p>The following example shows the configuration of SNMP view.</p> <pre>Switch# show snmp view View Name Subtree OID OID Mask View Type ----- -----</pre>

```
all .1
all included
private .1.3.3.1
all included
```

```
Total Entries: 2
```

show snmp user

Syntax	show snmp user
---------------	-----------------------

Parameter	N/A
------------------	-----

Default	N/A
----------------	-----

Mode	Privileged EXEC
-------------	-----------------

Usage	To show the SNMP users defined on the switch, use the command show snmp user in the Privileged EXEC mode.
--------------	--

Example	The following example shows the configuration of SNMP user.
----------------	---

```
Switch# show snmp user
Username:          v3
Password:         *****
Privilege Mode:   rw
Access GroupName: v3
Authentication Protocol: md5
Encryption Protocol: none
Access SecLevel:  auth
```

```
Total Entries: 1
```

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
```

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	<i>community-name</i>	The SNMP community name. Its maximum length is 20 characters.
	view <i>view-name</i>	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 <i>group-name</i>	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
```

snmp engineid

Syntax **snmp engineid** (**default**|*ENGINEID*)

Parameter	default	Default engine ID generated on the basis of the switch MAC address.
	<i>ENGINEID</i>	Specify SNMP engine ID. The engine ID is the 10 to 64 hexadecimal characters, and the hexadecimal number must be divided by 2.

Default The default SNMP engine ID on the switch is based on switch MAC address.

Mode Global Configuration

Usage To define the SNMP engine on the switch, use the command **snmp engineid** in the Global Configuration mode.

Example The following example configure the switch SNMP engine ID

```
Switch(config)# snmp engineid 00036D001122
```

snmp engineid remote

Syntax **snmp engineid remote** (*ip-addr|ipv6-addr*) *ENGINEID*
no snmp engineid remote (*ip-addr|ipv6-addr*)

Parameter	<i>ENGINEID</i>	Specify SNMP engine ID. The engine ID is a 10 to 64 hexadecimal characters, and the hexadecimal number must be divided by 2.
	<i>ip-addr</i>	IP address of the remote host
	<i>ipv6-addr</i>	IPv6 address of the remote host

Default N/A

Mode Global Configuration

Usage To define the remote host for SNMP engine, use the command **snmp engineid remote** in the Global Configuration mode; and use the **no** form of the command to delete the remote host from the SNMP engine.

Example The following example adds the remote *192.168.1.11* into SNMP engine

```
Switch(config)# snmp engineid remote 192.168.1.11 00036D10000A
```

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	<i>group-name</i>	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 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.
	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 Global 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

```
Switch(config)# snmp group v3 version 3 auth read-view all
write-view all notify-view all
```

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)**]

<i>ip-addr</i>	The IP address of recipient.
<i>ipv6-addr</i>	The IPv6 address of recipient.
<i>hostname</i>	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.
<i>community-name</i>	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
```

snmp trap

Syntax

snmp trap (**auth|cold-start|linkUpDown|port-security|warm-start**)
no snmp trap (**auth|cold-start|linkUpDown|port-security|warm-start**)

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
```

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*

<i>username</i>	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 .
<i>group-name</i>	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.
<i>AUTHPASSWD</i>	The password for authentication and the range of length is from 8 to 32 characters.
Priv <i>PRIVPASSWD</i>	The private password for the privacy key, and the range of length is from 8 to 64 characters.

Default N/A

Mode Global Configuration

Usage To define a SNMP user, use the command `snmp user` in the Global Configuration mode; and use the `no` form to delete the SNMP user.

Example The following example adds SNMP user `v3` into the group `v3` by the MD5 authentication.

```
Switch(config)# snmp user v3 v3 auth md5 12345678
```

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)`

<i>view-name</i>	The SNMP view name. Its maximum length is 30 characters.
------------------	--

subtree <i>oid-tree</i>	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 `snmp view` in the Global Configuration mode; and use the `no` form of the command to delete the SNMP view.

The default SNMP view cannot be deleted and modified by users. By default, the maximum numbers of SNMP view is limited to 16.

Example The following example defines the SNMP view.

```
Switch(config)# snmp view private subtree 1.3.3.1 oid-mask all viewtype included
```

29. Spanning Tree

instance (MST)

Syntax	instance <i>instance-id</i> vlan <i>vlan-list</i> no instance <i>instance-id</i> vlan <i>vlan-list</i>
Parameter	<i>instance-id</i> The MSTP instance ID from 0 to 15. vlan <i>vlan-list</i> 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

name (MST)

Syntax	name <i>name-str</i> no name
Parameter	<i>name-str</i> 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 <i>Valkyrie</i> .
----------------	--

```
Switch(config)# spanning-tree mst configuration
Switch(config-mst)# name Valkyrie
```

revision (MST)

Syntax	revision <i>rev</i> no revision
---------------	--

Parameter	<i>rev</i> 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
```

show spanning-tree

Syntax	show spanning-tree
---------------	---------------------------

Parameter	N/A
------------------	-----

Default	N/A
----------------	-----

Mode	Privileged EXEC
-------------	-----------------

Usage To display the spanning tree configuration, use the command `spanning-tree` in the Privileged EXEC mode

Example The following example shows the spanning tree configuration.

```
Switch# show spanning-tree

Spanning tree enabled mode RSTP
Default port cost method: short

    Root ID    Priority    32768
              Address    00:11:22:33:44:55
              This switch is the root
              Hello Time 4 sec Max Age 10 sec Forward Delay
25 sec

    Number of topology changes 2 last change occurred 20:34:30 ago
    Times: hold 0, topology change 0, notification 0
           hello 4, max age 10, forward delay 25

Interfaces
  Name      State   Prio.Nbr   Cost     Sts    Role  EdgePort
Type
-----
          fa23  enabled   128.23     19     Blk   Desg     No P2P
(RSTP)
```

show spanning-tree interface

Syntax `show spanning-tree interface IF_PORTS [statistic]`

Parameter	interface	An interface ID or the list of interface IDs.
	<i>IF_PORTS</i>	
	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 fa23.

```
Switch# show spanning-tree interfaces fa23

Port fa23 enabled
State: forwarding                               Role:
designated
Port id: 128.23                                 Port cost: 19
Type: P2P (RSTP)                               Edge Port: No
Designated bridge Priority : 32768             Address:
00:11:22:33:44:55
Designated port id: 128.23                     Designated path
cost: 0
BPDU Filter: Disabled                          BPDU guard:
Disabled
BPDU: sent 21886, received 0
```

The following example shows the STP statistic for the interface fa23.

```
Switch# show spanning-tree interfaces fa23 statistic

  STP Port Statistic
=====

Port                               : fa23
Configuration BDPUs Received       : 0
TCN BDPUs Received                 : 0
MSTP BDPUs Received                : 0
Configuration BDPUs Transmitted    : 0
TCN BDPUs Transmitted              : 0
MSTP BDPUs Transmitted             : 21917
=====
```

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
```

```
MST Instance Information
```

```
=====
Instance Type : CIST (0)
Bridge Identifier : 32768/ 0/00:11:22:33:44:55
-----
Designated Root Bridge : 32768/ 0/00:11:22:33:44:55
External Root Path Cost : 0
Regional Root Bridge : 32768/ 0/00:11:22:33:44:55
Internal Root Path Cost : 0
Designated Bridge : 32768/ 0/00:11:22:33:44:55
Root Port : 0/0
Max Age : 10
Forward Delay : 25
Topology changes : 3
Last Topology Change : 930
-----
--- VLANs mapped: 1-99,111-4094
=====
```

```
Interface      Role Sts Cost      Prio.Nbr Type
-----
fa23           Desg FWD 19        128.23  P2P (RSTP)
```

```
Switch# show spanning-tree mst
```

```
1 MST Instance Information
```

```
=====
Instance Type : MSTI (1)
Bridge Identifier : 32768/ 0/00:11:22:33:44:55
-----
Regional Root Bridge : 32768/
0/00:11:22:33:44:55 Internal Root Path Cost : 0
Remaining Hops :
10 Topology
changes : 3
Last Topology Change : 933
-----
VLANs mapped: 100-110
=====
```

```
Interface      Role Sts Cost      Prio.Nbr Type
-----
fa23           Desg FWD 19        128.23  P2P (RSTP)
```

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
Name          [00:11:22:33:44:55]
Revision      0          Instances configured 2

Instance      Vlans mapped
-----
0             1-99,111-4094
1             100-110
-----
```

show spanning-tree mst interface

Syntax **show spanning-tree mst *instance-id* interface *IF_PORTS***

Parameter	<i>instance-id</i>	The MSTP instance ID. Its valid range is from 0 to 15.
Parameter	interface <i>IF_PORTS</i>	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 fa23.

```
Switch# show spanning-tree mst 0 interfaces fa23

MST Port Information
=====
Instance Type : CIST (0)
-----
```

```
Port Identifier : 128/23
External Path-Cost : 0

/19
Internal Path-Cost : 0          /19
-----
Designated Root Bridge :
32768/00:11:22:33:44:55 External Root Cost :
0
Regional Root Bridge :
32768/00:11:22:33:44:55 Internal Root Cost :
0
Designated Bridge :
32768/00:11:22:33:44:55 Internal Port Path Cost :
19
Port Role :
Designated Port
State : Forwarding
-----

Switch# show spanning-tree mst 1 interfaces fa23

MST Port Information
=====
Instance Type : MSTI (1)
-----

Port Identifier : 128/23
Internal Path-Cost : 0

/19
-----
Regional Root Bridge :
32768/00:11:22:33:44:55 Internal Root Cost :
0
Designated Bridge :
32768/00:11:22:33:44:55 Internal Port Path Cost :
19
Port Role :
Designated Port
State : Forwarding
-----
```

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
```

```
Switch(config)# spanning-tree
```

spanning-tree bpdu

Syntax	spanning-tree bpdu (filtering flooding) no spanning-tree bpdu				
Parameter	<table><tr><td>filtering</td><td>Filter the BPDU when STP is disabled.</td></tr><tr><td>flooding</td><td>Flood the BPDU when the STP is disabled.</td></tr></table>	filtering	Filter the BPDU when STP is disabled.	flooding	Flood the BPDU when the STP is disabled.
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	<p>The following example configures the action of BPDU handling to filter when the STP is disabled.</p> <pre>Switch(config)# spanning-tree bpdu filtering</pre>				

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
```

spanning-tree bpdu-guard

Syntax **spanning-tree bpdu-guard**
no spanning-tree bpdu-guard

Parameter N/A

Default BPDU guard is disabled

Mode Interface Configuration

Usage To enable the BPDU filter, use the command **spanning-tree bpdu-guard** in the Interface Configuration mode; and use **no** form of the command to disable the BPDU filter.

Example The following example enables the BPDU guard for interface gi1.

```
Switch(config)# interface gi1
Switch(config-if)# spanning-tree bpdu-guard
```

spanning-tree cost

Syntax **spanning-tree cost *cost***
no spanning-tree cost

Parameter *cost* The port path cost. For the long path cost method, its valid range is from 0 to 200000000; and the valid range is from 0 to 65535 for the short path cost method. The value 0 indicates AUTO, which the port path cost is determined by the port speed and the path cost method.

Default The default port path cost is 0, and it is determined by the port speed and the path cost method (long or short).

Interface	Long	Short
Gigabit Ethernet (1000Mbps)	20000	4
Fast Ethernet (100Mbps)	200000	19
Ethernet (10Mbps)	2000000	100

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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 fa2.

```
Switch(config)# interface gil  
Switch(config-if)# spanning-tree cost 30000
```

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
```

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.

```
Switch(config)# spanning-tree hello-time 4
```

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 fa1.

```
Switch(config)# interface fa1
```

```
Switch(config-if)# spanning-tree edge
```

spanning-tree link-type

Syntax	spanning-tree link-type (point-to-point shared) no spanning-tree link-type				
Parameter	<table><tr><td>point-to-point</td><td>Specify the port link type is point to point.</td></tr><tr><td>shared</td><td>Specify the port link type is shared.</td></tr></table>	point-to-point	Specify the port link type is point to point.	shared	Specify the port link type is shared.
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	<p>The following example configures the link-type to point-to-point for the interface fa1.</p> <pre>Switch(config)# interface fa1 Switch(config-if)# spanning-tree link-type point-to-point</pre>				

spanning-tree max-hops

Syntax	spanning-tree max-hops <i>counts</i> no spanning-tree max-hops		
Parameter	<table><tr><td><i>counts</i></td><td>Specify the number of hops in an MSTP region before the BPDU is discarded. The valid range is 1 to 40.</td></tr></table>	<i>counts</i>	Specify the number of hops in an MSTP region before the BPDU is discarded. The valid range is 1 to 40.
<i>counts</i>	Specify the number of hops in an MSTP region before the BPDU is discarded. The valid range is 1 to 40.		
Default	The default max-hops configuration is 20.		
Mode	Global Configuration		
Usage	To specify the number of hops for a BPDU to be forwarded in the MSTP region, use the command spanning-tree max-hops in the Global Configuration mode; and restore the setting to default configuration by the no form of the command.		

Example	The following example specifies the max hops for BPDU to 10. <code>Switch(config)# spanning-tree max-hops 10</code>
----------------	--

spanning-tree maximum-age

Syntax	spanning-tree maximum-age <i>seconds</i> no spanning-tree maximum-age
---------------	--

Parameter	<i>seconds</i>	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. <code>Switch(config)# spanning-tree maximum-age 10</code>
----------------	--

spanning-tree mcheck

Syntax	spanning-tree mechek
---------------	-----------------------------

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 fa1.

```
Switch(config)# interface fa1
Switch(config-if)# spanning-tree mcheck
```

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
```

spanning-tree mst configuration

Syntax `spanning-tree mst configuration`

Parameter N/A

Default N/A

Mode Global Configuration

Usage To enter the MST configuration mode for the MSTP configuration modification, use the command **spanning-tree mst configuration** in the Global Configuration mode.

Example The following example modifies the MSTP configuration in the MST Configuration mode.

```
Switch(config)# spanning-tree mst configuration
Switch(config-mst)# instance 1 vlan 10-20
Switch(config-mst)# name Valkyrie
Switch(config-mst)# revision 1
```

spanning-tree mst cost

Syntax **spanning-tree mst** *instance-id* **cost** *cost*
no spanning-tree mst *instance-id* **cost** *cost*

Parameter	
<i>instance-id</i>	Specify the instance ID. The valid range is from 0 to 15.
<i>cost</i>	Specify the path cost for the interfaces on the specific MSTP instance. For the long path cost method, its valid range is from 0 to 200000000; and the valid range is from 0 to 65535 for the short path cost method. The value 0 indicates AUTO, which the port path cost is determined by the port speed and the path cost method.

Default The default port path cost is 0, and it is determined by the port speed and the path cost method (long or short).

Interface	Long	Short
Gigabit Ethernet (1000Mbps)	20000	4
Fast Ethernet (100Mbps)	200000	19
Ethernet (10Mbps)	2000000	100

Mode Interface Configuration

Usage To configure the path cost for MSTP calculations, use the command **spanning-tree mst cost** in the Interface Configuration mode. If the loop occurs, the MSTP considers the path cost when selecting the interface into the Forwarding state. For the default configuration, use the no form of the command.

When configuring the path cost on the CIST (instance 0), it is equal to the

command **spanning-tree cost** in the Interface Configuration mode.

Example

The following example configures the path cost of interface fa1 on the instance 1 to 30000

```
Switch(config)# interface gil
Switch(config-if)# spanning-tree mst 1 cost 30000
```

spanning-tree mst port-priority

Syntax

spanning-tree mst *instance-id* **port-priority** *priority*
no spanning-tree mst *instance-id* **port-priority**

Parameter

<i>instance-id</i>	Specify the instance ID. The valid range is from 0 to 15.
<i>priority</i>	Specify the interface priority on the specific instance.

Default

The default port priority on each instance is 128

Mode

Interface Configuration

Usage

To configure the interface priority on the specific instances, use the command **spanning-tree mst port-priority** in the Interface Configuration mode. For the default configuration, use the **no** form of the command.

The priority value must be the multiple of 16. When the port priority on the CIST (instance 0) is configured, it is equal to the command **spanning-tree port-priority** in the Interface Configuration mode.

Example

The following example sets the port priority of gil on the instance 1 to 144; and set the port priority of gil on the CIST (instance 0) to 96

```
Switch(config)# interface gil
Switch(config-if)# spanning-tree mst 1 port-priority 144
Switch(config-if)# spanning-tree mst 0 port-priority 96
```

spanning-tree mst priority

Syntax

spanning-tree mst instance *instance-id* **priority** *priority*
no spanning-tree mst instance *instance-id* **priority**

Parameter

<i>instance-id</i>	Specify the instance ID. The valid range is from 0 to 15.
<i>priority</i>	Specify the bridge priority on the specific instance. 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.

Default The default priority on each instance is 32768.

Mode Global Configuration

Usage To configure the bridge priority on the specific instance, use the command **spanning-tree mst priority** in the Global Configuration mode. To restore the default configuration, use the **no** form of the command.

The value of bridge priority must be the multiple of 4096. A switch with the lowest priority is the root of the STP topology. For the configuration of bridge priority on the CIST (instance 0), it is equal to the command **spanning-tree priority** in the Global Configuration mode.

Example The following example modifies the bridge priority to 4096 on instance 0 and instance 1 individually.

```
Switch(config)# spanning-tree mst 0 priority 4096  
Switch(config)# spanning-tree mst 1 priority 4096
```

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>
----------------	---

spanning-tree port-priority

Syntax	spanning-tree port-priority <i>priority</i> no spanning-tree port-priority <i>priority</i>
Parameter	<i>priority</i> 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>
----------------	--

spanning-tree priority

Syntax	spanning-tree priority <i>priority</i> no spanning-tree priority
Parameter	<i>instance-id</i> Specify the instance ID. The valid range is from 0 to 15. <i>priority</i> Specify the bridge STP priority. The valid range is from 0 to 61440. It nsures the probility that the switch is selected as the root bridge, and the lower values has the higher priority for the switch to be selected as the root bridge of the STP 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.

```
Switch(config)# spanning-tree priority 4096
```

spanning-tree tx-hold-count

Syntax **spanning-tree tx-hold-count** *count*
no spanning-tree tx-hold-count

Parameter *count* Specify the tx-hold-count used to limit the maximum numbers of packets transmission per second. The valid range is from 1 to 10.

Default The default value is 6.

Mode Global Configuration

Usage To limit the maximum numbers of packets transmission per second, use the command **spanning-tree tx-hold-count** in the Global Configuration mode. For the default configuration, use the **no** form of the command.

Example The following example sets the tx-hold-count to 4.

```
Switch(config)# spanning-tree tx-hold-count 4
```

30. Storm Control

show storm-control

Syntax **show storm-control**

show storm-control interface *IF_PORTS*

Parameter	<i>IF_PORTS</i> Specify port to show.
------------------	---------------------------------------

Default	No default value for this command
----------------	-----------------------------------

Mode	Privileged EXEC
-------------	-----------------

Usage	<p>Use “show storm-control” command to show all storm control related configurations including global configuration and per port configurations.</p> <p>Use “show storm-control interface” command to show selected port storm control configurations.</p>
--------------	--

Example	<p>This example shows how to show storm control global configuration.</p> <pre>Switch# show storm-control Storm control preamble and IFG: Excluded Storm control unit: pps</pre>
----------------	--

This example shows how to show current storm control configuration on interface *gi1*

```
Switch# show storm-control interfaces gi1
Port      | State | Broadcast | Unknow-Multicast | Unknow-Unicast | Action
          |      | pps       |                   | pps             | pps
-----+-----+-----+-----+-----+-----
fal      enable   200         Off( 10000)      Off( 10000)
Shutdown
```

storm-control

Syntax	<p>storm-control</p> <p>no storm-control</p>
---------------	--

storm-control (broadcast | unknown-unicast | unknown-multicast)
no storm-control (broadcast | unknown-unicast | unknown-multicast)

Parameter	broadcast Select broadcast storm control type
	unknown-unicast Select unknown unicast storm control type
	unknown-multicast Select unknown multicast storm control type

Default	<p>Default storm control is disabled.</p> <p>Default broadcast storm control is disabled.</p>
----------------	---

Default unknown multicast storm control is disabled
Default unknown unicast storm control is disabled

Mode Interface Configuration

Usage Storm control function is able to enable/disable on each single port. Use the “**storm control**” command to enable storm control feature on the selected ports. And use “**no storm control**” command to disable storm control feature. Not only port is able to enable/disable on the port. Each storm control type is also able to enable/disable on each single port.

Use the “**storm-control (broadcast|unknown-unicast|unknown-multicast)**” command to enable the storm control type you need and use no form to disable it.

Example This example shows how to enable storm control on interface gi1.
Switch(config)# **interface gi1**
Switch(config-if)# **storm-control**

This example shows how to enable broadcast storm control and configure broadcast storm control rate to 200.
Switch(config)# **interface gi1**
Switch(config-if)# **storm-control broadcast**

This example shows how to show current storm control configuration on interface gi1

```
Switch# show storm-control interfaces gi1
  Port      | State | Broadcast | Unkown-Multicast | Unknown-Unicast | Action
            |       | pps       |                   | pps              | pps
-----+-----+-----+-----+-----+-----
---
  gi1      | enable | 200       | Off( 10000)     | Off( 10000)     | Shutdown
```

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.


```
Storm control unit: pps
.....
```

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 gil
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 gil

```
Switch# show storm-control interfaces gil
```

Port	State	Broadcast	Unkown-Multicast	Unknown-Unicast
Action		pps	pps	pps
-----+-----+-----+-----+----- -----				

gil	enable	200	Off(10000)	Off(10000)
Shutdown				

storm-control unit

Syntax	storm-control unit (bps pps)				
Parameter	<table border="1"> <tr> <td>bps</td> <td>Storm control rate calculates by octet-based</td> </tr> <tr> <td>pps</td> <td>Storm control rate calculates by packet-based</td> </tr> </table>	bps	Storm control rate calculates by octet-based	pps	Storm control rate calculates by packet-based
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	<p>Storm control mechanism will try to calculate ingress packets is exceed configured rate or not and do corresponding action.</p> <p>Use storm-control unit command to change the unit of calculating method.</p>				
Example	<p>This example shows how to configure storm control rate unit as pps.</p> <pre>Switch(config)# storm-control unit pps</pre> <p>This example shows how to show storm control global configuration.</p> <pre>Switch# show storm-control Storm control preamble and IFG: Excluded Storm control unit: pps</pre>				

31. System File

boot system

Syntax	boot system (image0 image1)				
Parameter	<table border="1"> <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 image0.				
Mode	Global Configuration				

Usage

Dual image allow user to have a backup image in the flash partition.
Use “**boot system**” command to select the active firmware image.
And another firmware image will become a backup one.

Example

This example shows how to select image1 as active image.

```
Switch(config)# boot system image1
Select "image1" Success
```

This example shows how to show active image partition.

```
Switch# show flash
```

File Name	File Size	Modified
startup-config	1191	2000-01-01 00:00:23
backup-config	1607	2000-01-01 08:36:23
rsa1	974	2000-01-01 00:00:18
rsa2	1675	2000-01-01 00:00:18
dsa2	668	2000-01-01 00:00:18
ssl_cert	993	2000-01-01 00:00:18
image0 (backup)	4372401	2012-09-24 01:57:29
image1 (active)	5555970	2012-06-12 12:17:46

copy

Syntax

```
copy (flash:// | tftp://) (flash:// | tftp://)
copy tftp:// (backup-config | running-config | startup-config)
copy (backup-config | running-config | startup-config) tftp://
```

```
copy (backup-config | startup-config) running-config
copy (backup-config | running-config) startup-config
copy (running-config | startup-config) backup-config
```

Parameter

flash://	Specify the file stored in flash to operation. Available files are: flash://startup-config flash://backup-config flash://rsa1 flash://rsa2 flash://dsa2 flash://image0 flash://image1 flash://ram.log flash://flash.log
tftp://	Specify remote tftp server and remote file name. The format is “ tftp://192.168.1.111/remote_file_name ”
running-config	Running configuration file
startup-config	Startup configuration file
backup-config	Backup configuration file

Default

No default value for this command.

Mode Privileged EXEC

Usage There are many types of files in system. These files are very important for administrator to manage the switch. The most common file operation is copy. By using these copy commands, we can upgrade, backup following type of files.

- **Firmware Image**
- **Configuration Files**
- **Syslog Files**
- **Language Files**
- **Security Certificate**

Example This example shows how to copy running configuration to startup configuration.

```
Switch# copy running-config startupst-config
```

This example shows how to backup running configuration to remote tftp server 192.168.1.111 with file name test1.cfg.

```
Switch# copy running-config tftp://192.168.1.111/test1.cfg
Uploading file...Please Wait...
Uploading Done
```

This example shows how to upgrade startup configuration from remote tftp server 192.168.1.111 with file name test2.cfg.

```
Switch# copy tftp://192.168.1.111/test2.cfg startup-config
Downloading file...Please Wait...
Downloading Done
Upgrade config success. Do you want to reboot now? (y/n)n
```

This example shows how to backup security file dsa2 to remote tftp server 192.168.1.111 with file name dsa2.

```
Switch# copy flash://dsa2 tftp://192.168.1.111/dsa2
Uploading file...Please Wait...
Uploading Done
```

delete

Syntax `delete (startrup-config | backup-config | flash://)`

`delete system (image0 | image1)`

Parameter	flash://	Specify the configuration file stored in flash to delete. Available files are: flash://startup-config flash://backup-config
	startup-config	Delete startup configuration file

backup-config	Delete backup configuration file
image0	Delete flash image0.
image1	Delete flash image1.

Default No default value for this command.

Mode Privileged EXEC

Usage Use “**delete**” command to delete configuration files or use “**delete system**” command to delete firmware image stored in flash.
The “**delete startup-config**” command is using to restore factory default and it is equal to command “**restore-defaults**”.

Example This example shows how to delete backup configuration file.

```
Switch# delete backup-config
```

This example shows how to delete backup firmware image from flash.

```
Switch# delete system image1
```

This example shows how to show file status in flash.

```
Switch# show flash
```

File Name	File Size	Modified
startup-config	1191	2000-01-01 00:00:23
backup-config	1607	2000-01-01 08:36:23
rsa1	974	2000-01-01 00:00:18
rsa2	1675	2000-01-01 00:00:18
dsa2	668	2000-01-01 00:00:18
ssl_cert	993	2000-01-01 00:00:18
image0 (active)	4372401	2012-09-24 01:57:29
image1 (backup)	0	

restore-defaults

Syntax **restore-defaults** [**interfaces** *IF_PORTS*]

Parameter **interfaces** Specify port to restore its' ruuning config
IF_PORTS

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**
Restore Default Success. Do you want to reboot now? (y/n)n

save

Syntax **save**

Parameter

Default No default value for this command.

Mode Privileged EXEC

Usage Use “**save**” command to save running configuration to startup configuration file. This command is equal to “**copy running-config startup-config**”.

Example This example shows how to save running configuration to startup configuration.

```
Switch# save  
Success
```

This example shows how to show startup configuration

```
Switch# show startup-config  
! System Description: RTK RTL8328-24FE-4GE Switch  
! System Version: v2.5.0-beta.32811  
! System Name: SwitchEF0102  
! System Up Time: 0 days, 4 hours, 31 mins, 43 secs  
!  
!  
!  
username "" privilege user secret "dnXencJRwflV6"  
username "admin" secret "FzjrGO6vfbERY"  
voice-vlan vpt 0  
voice-vlan dscp 0  
.....
```

show bootvar

Syntax **show bootvar**

Parameter

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
```

Image	Version	Date	Status	File Name
0	3.0.5	2014-09-22 16:53:53	Active	v3.0.5.bix
1	3.1.0	2014-10-09 18:32:26	Not active*	v3.1.0.bix

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
! System Description: RTK RTL8328-24FE-4GE Switch
! System Version: v2.5.0-beta.32811
! System Name: SwitchEF0102
! System Up Time: 0 days, 4 hours, 31 mins, 43 secs
!
!
!
username "" privilege user secret "dnXencJRwflV6"
username "admin" secret "FzjrGO6vfbERY"
voice-vlan vpt 0
voice-vlan dscp 0
.....
```

This example shows how to show running configuration

```
Switch# show running-config
! System Description: RTK RTL8328-24FE-4GE Switch
! System Version: v2.5.0-beta.32811
! System Name: SwitchEF0102
! System Up Time: 0 days, 5 hours, 23 mins, 42 secs
!
!
!
username "" privilege user secret "dnXencJRwflV6"
username "admin" secret "FzjrGO6vfbERY"
voice-vlan vpt 0
voice-vlan dscp 0
.....
```

This example shows how to display running configuration on specific port.

```
Switch# show running-config interfaces gil
interface gil
 rate-limit ingress 128
```

show flash

Syntax

show flash

Parameter

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**

File Name	File Size	Modified
startup-config	1191	2000-01-01 00:00:23
backup-config	1607	2000-01-01 08:36:23
rsa1	974	2000-01-01 00:00:18
rsa2	1675	2000-01-01 00:00:18
dsa2	668	2000-01-01 00:00:18
ssl_cert	993	2000-01-01 00:00:18
image0 (active)	4372401	2012-09-24 01:57:29
image1 (backup)	0	

32. Surveillance VLAN

surveillance-vlan (Global)

Syntax

surveillance-vlan
no surveillance -vlan

Parameter

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
Administrate Surveillance VLAN state : disabled
Surveillance VLAN ID      : none (disable)
Surveillance VLAN Aging   : 1440 minutes
Surveillance VLAN CoS     : 6
Surveillance VLAN 1p Remark: disabled
```

surveillance-vlan (Interface)

Syntax

surveillance-vlan
no surveillance-vlan

Parameter

N/A

Default	Disable by default.
Mode	Interface Configuration
Usage	<p>Use the surveillance vlan Interface configuration command to enable OUI surveillance VLAN configuration on an interface</p> <p>Use the no form of this command to disable Surveillance VLAN on an interfaces</p> <p>You can verify your setting by entering the show surveillance vlan Privileged EXEC command</p>

Example

The following example how to enable Surveillance VLAN function in oui mode on an interface

```
Switch(config)#interface range fa1-3
Switch(config-if)#surveillance-vlan
Switch# show surveillance-vlan interfaces fa1-3
Surveillance VLAN Aging   : 1440 minutes
Surveillance VLAN CoS     7
Surveillance VLAN 1p Remark: enabled
```

OUI table

OUI MAC	Description
00:01:02	Test

Port	State	Port Mode	Cos Mode
fa1	Disabled	Auto	Src
fa2	Disabled	Auto	Src
fa3	Disabled	Auto	Src

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 Administrate Surveillance VLAN state : enabled Surveillance VLAN ID 128 Surveillance VLAN Aging : 1440 minutes Surveillance VLAN CoS 6 Surveillance VLAN 1p Remark: disabled

surveillance-vlan oui-table

Syntax	surveillance-vlan oui-table A:B:C [DESCRIPTION] no surveillance-vlan oui-table [A:B:C]
Parameter	A:B:C Specify OUI Mac address to add or remove DESCRIPTION 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 fa1-3 Surveillance VLAN Aging : 1440 minutes Surveillance VLAN CoS : 6

Surveillance VLAN 1p Remark: disabled

OUI table

OUI MAC | Description

-----+-----
00:01:02 | Test

Port | State | Port Mode | Cos Mode

-----+-----+-----+-----
fa1 | Disabled | Auto |
Src fa2 | |
Disabled | Auto |
Src
fa3 | Disabled | Auto | Src

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
Administrate Surveillance VLAN state : disabled
Surveillance VLAN ID      128
Surveillance VLAN Aging   : 1440 minutes
Surveillance VLAN CoS     7
Surveillance VLAN 1p Remark: enabled
```

surveillance-vlan cos (Interface)

Syntax	surveillance-vlan cos (src all) no surveillance-vlan cos																
Parameter	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%; padding: 2px;">src</td> <td style="padding: 2px;">Specify QoS attributes are applied to packets with OUIs in the source MAC address.</td> </tr> <tr> <td style="padding: 2px;">All</td> <td style="padding: 2px;">Specify QoS attributes are applied to packets that are classified to the Surveillance VLAN.</td> </tr> </table>	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.												
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	Interface configuration																
Usage	<p>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</p>																
Example	<p>The following example how to configure surveillance packet QoS attributes on an interface</p> <pre>Switch(config)#interface range fa1-3 Switch(config-if)#surveillance-vlan cos all Switch# show surveillance-vlan interfaces fa1-3 Surveillance VLAN Aging : 1440 minutes Surveillance VLAN CoS : 7 Surveillance VLAN 1p Remark: enabled</pre> <p>OOUI table</p> <pre> OUI MAC Description -----+----- 00:01:02 Test</pre> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="text-align: left;">Port</th> <th style="text-align: left;"> State</th> <th style="text-align: left;"> Port Mode</th> <th style="text-align: left;"> Cos Mode</th> </tr> </thead> <tbody> <tr> <td>fa1</td> <td> Disabled</td> <td> Auto</td> <td> All</td> </tr> <tr> <td>fa2</td> <td> Disabled</td> <td> Auto</td> <td> All</td> </tr> <tr> <td>fa3</td> <td> Disabled</td> <td> Auto</td> <td> All</td> </tr> </tbody> </table>	Port	State	Port Mode	Cos Mode	fa1	Disabled	Auto	All	fa2	Disabled	Auto	All	fa3	Disabled	Auto	All
Port	State	Port Mode	Cos Mode														
fa1	Disabled	Auto	All														
fa2	Disabled	Auto	All														
fa3	Disabled	Auto	All														

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 shows how to configure surveillance mode to manual

```
Switch(config)#interface range fa1-3
Switch(config-if)#surveillance-vlan mode manual
Switch# show surveillance-vlan interfaces fa1-3
Surveillance VLAN Aging   : 1440 minutes
Surveillance VLAN CoS     : 7
Surveillance VLAN 1p Remark: enabled
```

```
OUI table
OUI MAC | Description
-----+-----
00:01:02 | Test
```

```
Port   | State | Port Mode | Cos Mode
-----+-----+-----+-----
fa1   | Disabled | Manual   | Src
fa2   | Disabled | Manual   | Src
fa3   | Disabled | Manual   | Src
```

surveillance-vlan aging-time

Syntax **surveillance-vlan aging-time** <30-65536>
no surveillance-vlan aging-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  
Administrate Surveillance VLAN state : disabled  
Surveillance VLAN ID      1  
Surveillance VLAN Aging   : 720 minutes  
Surveillance VLAN CoS     5  
Surveillance VLAN 1p Remark: enabled
```

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
Administrate Surveillance VLAN state : disabled
Surveillance VLAN ID      : none (disable)
Surveillance VLAN Aging   : 720 minutes
Surveillance VLAN CoS     : 6
Surveillance VLAN 1p Remark: disabled
```

```
Switch# show surveillance-vlan interfaces fa1-4
Surveillance VLAN Aging   : 720 minutes
Surveillance VLAN CoS     : 5
Surveillance VLAN 1p Remark: enabled
```

OOUI table

```
OUI MAC | Description
-----+-----
00:01:02 | Test
```

```
Port   | State | Port Mode | Cos Mode
-----+-----+-----+-----
fa1    | Disabled | Auto   | Src
fa2    | Disabled | Auto   | Src
fa3    | Disabled | Auto   | Src
```

33. Time

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

HH:MM:SS Specify static time of year, month, day, hour, minute, second
(jan|feb|mar|apr|may|jun|jul|aug|sep|oct|nov|dec)
<1-31> <2000-2035>

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  
11:03:00 DFL(UTC+8) Sep 21 2012
```

```
switch# show clock  
11:03:21 DFL(UTC+8) Sep 21 2012  
No time source
```

clock timezone

Syntax **clock timezone ACRONYM HOUR-OFFSET [minutes <0-59>]**
_ no clock timezone

Parameter	ACRONYM	Specify acronym name of time zone
	HOUR-OFFSET	Specify hour offset of time zone
	Minutes <1-59>	Specify minute offset of time zone

Default Default time zone is UTC+8.

Mode Global Configuration

Usage Use the **clock timezone** command to set timezone setting.
Use the **no** form of this command to restore to default setting.
You can verify your setting by entering the **show clock detail Privileged EXEC** command.

Example The example shows how to set time zone of switch and then restore to default time zone.

```
switch(config)# clock timezone test +5  
switch(config)# show clock detail  
10:13:27 test(UTC+5) Sep 21 2012  
No time source
```

```
Time zone:  
Acronym is test  
Offset is UTC+5
```

```
switch(config)# no clock timezone  
switch(config)# show clock detail
```

13:14:50 DFL(UTC+8) Sep 21 2012
No time source

Time zone:
Acronym is
DFL Offset
is UTC+8

clock source

Syntax

clock source (local|sntp)

Parameter

local	Specify to use static time
sntp	Specify to use sntp 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.

```
switch(config)# clock source sntp  
switch(config)# show clock detail  
08:32:12 test(UTC+5) Sep 21 2012  
Time source is sntp
```

Time zone:
Acronym is DFL
Offset is UTC+8

clock summer-time

Syntax	<code>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)</code>
---------------	--

	(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												
Parameter	<table border="1"> <tr> <td>ACRONYM</td> <td>Specify acronym name of time zone</td> </tr> <tr> <td>(jan feb mar apr may jun jul aug sep oct nov dec) <1-31> <2000-2037> HH:MM</td> <td>Specify non-recurring daylight saving time duration.</td> </tr> <tr> <td>(jan feb mar apr may jun jul aug sep oct nov dec) <1-31> <2000-2037> HH:MM <1-1440></td> <td>Specify adjust offset of daylight saving time</td> </tr> <tr> <td>usa</td> <td>Using daylight saving time in the United States that starts on the second Sunday of March and ends on the first Sunday of November</td> </tr> <tr> <td>eu</td> <td>Using daylight saving time in the Europe that starts on the last Sunday in March and ending on the last Sunday in October</td> </tr> <tr> <td>(<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</td> <td>Specify ecurring daylight saving time duration.</td> </tr> </table>	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 <1-1440>	Specify adjust offset of daylight saving time	usa	Using daylight saving time in the United States that starts on the second Sunday of March and ends on the first Sunday of November	eu	Using daylight saving time in the Europe that starts on the last Sunday in March and ending on the last Sunday in October	(<1-5> first last) (sun mon tue wed thu fri sat) (jan feb mar apr may jun jul aug sep oct nov dec) HH:MM (<1-5> first last) (sun mon tue wed thu fri sat) (jan feb mar apr may jun jul aug sep oct nov dec) HH:MM	Specify ecurring daylight saving time duration.
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 <1-1440>	Specify adjust offset of daylight saving time												
usa	Using daylight saving time in the United States that starts on the second Sunday of March and ends on the first Sunday of November												
eu	Using daylight saving time in the Europe that starts on the last Sunday in March and ending on the last Sunday in October												
(<1-5> first last) (sun mon tue wed thu fri sat) (jan feb mar apr may jun jul aug sep oct nov dec) HH:MM (<1-5> first last) (sun mon tue wed thu fri sat) (jan feb mar apr may jun jul aug sep oct nov dec) HH:MM	Specify ecurring daylight saving time duration.												
Default	No default daylight saving time is defined.												
Mode	Global Configuration												
Usage	<p>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.</p> <p>Use the no form of this command to default setting.</p> <p>You can verify your setting by entering the show clock detail Privileged EXEC command.</p>												

Example The example shows how to set clock summer time of switch. You can verify settings by the following show show clock command.

```
switch(config)# clock summer-time test recurring usa
switch(config)# show clock detail
08:32:12 test(UTC+5) Sep 21 2012
No time source
```

```
Time zone:
Acronym is DFL
Offset is UTC+8
```

```
Summertime:
Acronym is test
Recurring every year.
Begins at 2 0 3 2:0
Ends at 1 0 11 2:0
Offset is 60 minutes.
```

show clock

Syntax `show clock [detail]`

Parameter `detail` Show more detail information of clock

Default No default is defined

Mode Privileged EXEC

Usage Use the **show clock** command to show clock of switch. The “**detail**” means that show more information of clock such as time zone and daylight saving time.

Example The example shows how to show clock of switch and detail information.

```
Switch334455(config)# clock source sntp
Switch334455(config)# clock summer-time DLS recurring usa
Switch334455(config)# sntp host 192.168.1.100
Switch334455(config)# show clock
14:34:43 DLS(UTC+9) Sep 25 2012
Time source is sntp
```

```
Switch334455(config)# show clock detail
14:35:39 DLS(UTC+9) Sep 25 2012
```

Time source is sntp

Time zone:
Acronym is
DFL Offset
is UTC+8

Summertime:
Acronym is DLS
Recurring every
year. Begins at 2 0
3 2:0
Ends at 1 0 11
2:0 Offset is 60
minutes.

sntp

Syntax

sntp host HOSTNAME [port <1-65535>]
no sntp

Parameter

HOSTNAME	Specify ip address or hostname of sntp server
sntp	Specify server port of sntp server

Default

No default SNTP server defined. Default server port is 123 when server created.

Mode

Global Configuration

Usage

Use the sntp command to set remote SNTP server. Use the no form of this command to default setting.
You can verify your setting by entering the **show sntp Privileged EXEC** command.

Example

The example shows how to set remote SNTP server of switch.

```
switch(config)# clock source sntp
switch(config)# sntp host 192.168.1.100
switch(config)# show sntp
SNTP is Enabled
SNTP Server address: 192.168.1.100
SNTP Server port: 123
```

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	<p>The example shows how to show remote SNTP server.</p> <pre>Switch334455(config)# show sntp SNTP is Enabled SNTP Server address: 192.168.1.100 SNTP Server port: 123</pre>

34. UDLD

errdisable recovery cause udd

Syntax	<pre>errdisable recovery cause udd no errdisable recovery cause udd</pre>
Parameter	<u>N/A</u>
Default	Error disable auto recovery is disabled by default.
Mode	Global EXEC
Usage	Use the errdisable recovery cause udd to enable auto recovery of UniDirectional Link Detection (UDLD). Use the “ no ” to disable it.
Example	<p>The example shows how to enable auto recovery of UniDirectional Link Detection (UDLD).</p> <pre>switch(config)# errdisable recovery cause udd switch# show errdisable recovery ErrDisable Reason Timer Status -----+----- bpduguard disabled</pre>

```
udld          | enabled
...
```

udld

Syntax

```
udld
no udld
```

Parameter

```
N/A
```

Default

UDLD is disabled by default.

Mode

Interface Configuration

Usage

Use the **udld** command to enable UniDirectional Link Detection (UDLD) normal mode of interface.
Use the no form of this command to restore to default setting.
You can verify your setting by entering the **show udld interface Privileged EXEC** command.

Example

The example shows how to enable UniDirectional Link Detection (UDLD) normal mode in interface gi1.

```
switch(config)# interface gi1
switch(config-if)# udld
switch# show udld interfaces gi1
Port enable administrative configuration setting: Enabled
Port enable operational state: Enabled
Current bidirectional state: Bidirectional
Current operational state: Advertisement - SINGLE NEIGHBOR
DETECTED
```

udld aggressive

Syntax

```
udld
aggressive no
udld
aggressive
```

Parameter

```
N/A
```

Default

UDLD aggressive mode is disabled by default.

Mode	Interface Configuration
Usage	Use the udld aggressive command to enable UniDirectional Link Detection (UDLD) aggressive mode of interface. Use the no form of this command to restore to default setting. You can verify your setting by entering the show udld interface Privileged EXEC command.
Example	<p>The example shows how to enable udld aggressive mode in interface gi1.</p> <pre>switch(config)# interface gi1 switch(config-if)# udld switch# show udld interfaces gi1 Port enable administrative configuration setting: Enabled / in aggressive mode Port enable operational state: Enabled / in aggressive mode Current bidirectional state: Bidirectional Current operational state: Advertisement - SINGLE NEIGHBOR DETECTED</pre>

udld message time

Syntax	udld message time <i>message-time-interval</i>
Parameter	<i>message-time-interval</i> Specify the interval for sending message. Range is 1 -90 seconds.
Default	Default interval is 15 seconds.
Mode	Global Configuration
Usage	Use the udld message time to set interval of UniDirectional Link Detection (UDLD) sent message.
Example	<p>The example shows how to set interval of UniDirectional Link Detection (UDLD) message.</p> <pre>switch(config)# udld message time 30</pre>

udld reset

Syntax	udld reset
Parameter	N/A
Default	No default is defined
Mode	Privileged EXEC
Usage	Use the udld reset command to reset all interfaces disabled by the UniDirectional Link Detection (UDLD) and permit traffic to begin passing through them again. If the interface configuration is still enabled for UDLD, these ports begin to run UDLD again and are disabled for the same reason if the problem has not been corrected.
Example	The example shows how to reset all interfaces disabled by UDLD Switch# udld reset 1 ports shutdown by UDLD were reset.

show udld

Syntax	show udld show udld interfaces <i>IF_NMLPORTS</i>
Parameter	<i>IF_NMLPORTS</i> Specify the normal interfaces to display udld information
Default	No default is defined
Mode	Privileged EXEC
Usage	Use the show udld command to to display UniDirectional Link Detection (UDLD) administrative and operational status for all ports or the specified port.
Example	The example shows how to show UniDirectional Link Detection (UDLD) settings and operational status of interface gi1.

```
Switch334455(config)# show uddl interfaces gi1
```

```
Interface gi1
```

```
---
```

```
Port enable administrative configuration setting: Enabled / in aggressive  
mode Port enable operational state: Enabled / in aggressive mode
```

```
Current bidirectional state: Bidirectional
```

```
Current operational state: Advertisement - SINGLE
```

```
NEIGHBOR DETECTED
```

```
Message interval:
```

```
15 Time out
```

```
interval: 5
```

```
Entry 1
```

```
---
```

```
Expiration time: 20
```

```
Current neighbor state:
```

```
Bidirectional Device ID : COM4
```

```
Device name:
```

```
com4 Port ID:
```

```
gi3 Message
```

```
interval: 7 Time
```

```
out interval: 5
```

```
Neighbor echo 1 device:
```

```
COM3 Neighbor echo 1 port:
```

```
gi1
```

35. VLAN

vlan

Syntax

vlan

no vlan

Default

VLAN 1 created by default

Mode

Global Configuration

Usage

Use the **vlan** global configuration command to create VLAN. Use the **no** form of this command to remove exist VLAN.

You can verify your setting by entering the **show vlan Privileged EXEC** command.

Example

The following example creates and removes a VLAN entry (100).

```
Switch# configure  
Switch (config)# vlan 100  
Switch# show vlan
```

VID	VLAN Name	Untagged Ports	Tagged Ports	Type
1	default	fa1-48,gi1-4,lag1-8	---	Default
	VLAN0100	---	---	Static

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 **name** vlan configuration command to set name of 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-one-hundred`.

```
SwitchEF0101(config)# vlan 100
SwitchEF0101(config-vlan)# name VLAN-one-hundred
Switch# show vlan
```

VID	VLAN Name	Untagged Ports	Tagged Ports	Type
1	default	fa1-48,gi1-4,lag1-8	---	Default
100	VLAN-one-hundred	---	---	Static

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.

```
SwitchEF0101(config)# interface fa12
SwitchEF0101(config-if)# switchport mode access
SwitchEF0101# show interfaces switchport fa12
Port : fa12
Port Mode : Access
Ingress Filtering : enabled
Acceptable Frame Type : untagged-only
Ingress UnTagged VLAN ( NATIVE ) : 1
Trunking VLANs Enabled:
```

```
Port is member in:
Vlan  Name    Egress rule
-----
  1  default  Untagged
```

```
Forbidden VLANs:
Vlan Name
-----
```

```
SwitchEF0101#
```

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	<p>This example sets PVID to 100.</p> <pre>SwitchEF0101(config)# interface fa10 SwitchEF0101(config-if)# switchport mode hybrid SwitchEF0101(config-if)# switchport hybrid pvid 100 SwitchEF0101# show interfaces switchport fa10 Port : fa10 Port Mode : Hybrid Ingress Filtering : enabled Acceptable Frame Type : all Ingress UnTagged VLAN (NATIVE) : 100 Trunking VLANs Enabled: Port is member in: Vlan Name Egress rule ----- 1 default Untagged Forbidden VLANs: Vlan Name SwitchEF0101#</pre>

switchport hybrid ingress-filtering

Syntax	switchport hybrid ingress-filtering no switchport hybrid ingress-filtering
Default	Default is enabled
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.

```
SwitchEF0101(config)# interface fa10
SwitchEF0101(config-if)# switchport mode hybrid
SwitchEF0101(config-if)#no switchport hybrid ingress-filtering
SwitchEF0101# show interfaces switchport fa10
Port : fa10
Port Mode : Hybrid
Ingress Filtering : disabled
Acceptable Frame Type : all
Ingress UnTagged VLAN ( NATIVE ) : 100
Trunking VLANs Enabled:
```

Port is member in:

Vlan	Name	Egress rule
1	default	Untagged

Forbidden VLANs:

Vlan	Name
------	------

```
SwitchEF0101#
```

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 **s show interfaces switchport Privileged EXEC** command

Example

```

This example sets acceptable-frame-type to tagged-only.
SwitchEF0101(config)# interface fa10
SwitchEF0101(config-if)# switchport mode hybrid
SwitchEF0101(config-if)# switchport hybrid acceptable-frame-type tagged-
only
SwitchEF0101# show interfaces switchport fa10
Port : fa10
Port Mode : Nybrid
Ingress Filtering : disabled
Acceptable Frame Type : tagged-only
Ingress UnTagged VLAN ( NATIVE ) : 100
Trunking VLANs Enabled:

Port is member in:
Vlan  Name      Egress rule
-----
  1   default    Untagged

Forbidden VLANs:
Vlan  Name

SwitchEF0101#

```

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.
SwitchEF0101(config)# interface fa10
SwitchEF0101(config-if)# switchport hybrid allowed vlan add 100-105
SwitchEF0101(config-if)# switchport hybrid allowed vlan remove 105
SwitchEF0101# show interfaces switchport fa10
Port : fa10
Port Mode : Hybrid
Ingress Filtering : disabled
Acceptable Frame Type : tagged-only
Ingress UnTagged VLAN ( NATIVE ) : 100
Trunking VLANs Enabled:

```

Port is member in:

Vlan	Name	Egress rule
1	default	Untagged
100	VLAN-one-hundred	Tagged
101	VLAN0101	Tagged
102	VLAN0102	Tagged
103	VLAN0103	Tagged
104	VLAN0104	Tagged

Forbidden VLANs:

Vlan	Name
-----	-----

SwitchEF0101#

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 fa10 native VLAN ID to 100.

```
SwitchEF0101(config)# interface fa10
SwitchEF0101(config-if)# switchport mode access
SwitchEF0101(config-if)# switchport access vlan 100
SwitchEF0101# show interfaces switchport fa10
Port : fa10
Port Mode : Access
Ingress Filtering : enabled
Acceptable Frame Type : untagged-only
Ingress UnTagged VLAN ( NATIVE ) : 100
Trunking VLANs Enabled:
```

```
Port is member in:
Vlan Name          Egress rule
-----
100 VLAN-one-hundred Untagged
```

```
Forbidden VLANs:
Vlan Name
-----
```

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 fa10 native VLAN to 100.

```
SwitchEF0101(config)# interface fa10  
SwitchEF0101(config-if)# switchport mode tunnel  
SwitchEF0101(config-if)# switchport tunnel vlan 100
```

```
SwitchEF0101# show interfaces switchport
fa10 Port : fa10
Port Mode : Tunnel
Ingress Filtering :
enabled
Acceptable Frame Type : all
Ingress UnTagged VLAN ( NATIVE ) :
100 Trunking VLANs Enabled:

Port is member in:
Vlan Name          Egress rule
-----
100 VLAN-one-hundred Untagged

Forbidden
VLANs:
Vlan Name
-----
```

switchport trunk native vlan

Syntax	switchport trunk native vlan <1-4094> no switchport trunk native vlan
Parameter	<1-4094> Specifies the native 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 fa10 native VLAN to 100.

```
SwitchEF0101(config)# interface fa10
SwitchEF0101(config-if)# switchport mode trunk
SwitchEF0101(config-if)# switchport trunk native vlan 100
SwitchEF0101# show interfaces switchport fa10
Port : fa10
Port Mode : Trunk Ingress
Filtering : enabled
Acceptable Frame Type : all
```

Ingress UnTagged VLAN (NATIVE) :
100 Trunking VLANs Enabled:

Port is member in:

Vlan Name Egress rule

100 VLAN-one-hundred Untagged

Forbidden

VLANs:

Vlan Name

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.

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 **s show interfaces switchport Privileged EXEC** command.

Example

This example sets Trunk port fa10 to add the allowed VLAN 100.

```
SwitchEF0101(config)# interface fa10
SwitchEF0101(config-if)# switchport trunk allowed vlan add 100
SwitchEF0101# show interfaces switchport fa10
Port : fa10
Port Mode : Trunk Ingress
Filtering : enabled
Acceptable Frame Type : all
Ingress UnTagged VLAN ( NATIVE ) : 1
Trunking VLANs Enabled: 100
```

Port is member in:

Vlan Name	Egress rule
-----------	-------------

1 default	Untagged
-----------	----------

100 VLAN-one-hundred Tagged

Forbidden
VLANs:
Vlan Name

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 **s show interfaces switchport Privileged EXEC** command

Example

This example sets Trunk port fa10 membership with the default VLAN to tag.

```
SwitchEF0101(config)# interface fa10
SwitchEF0101(config-if)# switchport default-vlan tagged
SwitchEF0101# show interfaces switchport fa10
Port : fa10
Port Mode : Hybrid
Ingress Filtering : enabled
Acceptable Frame Type : all
Ingress UnTagged VLAN ( NATIVE ) : 1 Trunking
VLANs Enabled:
```

Port is member in:

Vlan	Name	Egress rule
------	------	-------------

1	default	Tagged
---	---------	--------

Forbidden VLANs:

Vlan	Name
------	------

switchport forbidden default-vlan

Syntax	switchport forbidden default-vlan no switchport forbidden default-vlan
Parameter	None
Default	Default is allowed
Mode	Port Configuration
Usage	<p>Use the switchport forbidden default-vlan port configuration command to forbid default-vlan on interface.</p> <p>Use the no switchport forbidden default-vlan port configuration command to restore to default</p> <p>You can verify your setting by entering the s show interfaces switchport Privileged EXEC command</p>
Example	<p>This example sets the membership of the default VLAN with port fa10 to forbidden.</p> <pre> SwitchEF0101(config)# interface fa10 SwitchEF0101(config-if)# switchport forbidden default-vlan SwitchEF0101# show interfaces switchport fa10 Port : fa10 Port Mode : Trunk Ingress Filtering : enabled Acceptable Frame Type : all Ingress UnTagged VLAN (NATIVE) : 4095 Trunking VLANs Enabled: Port is member in: Vlan Name Egress rule ----- </pre> <p>Forbidden VLANs:</p> <pre> Vlan Name ----- 1 default </pre>

switchport forbidden vlan

Syntax

switchport forbidden vlan (add | remove) VLAN-LIST

Parameter	(add remove) Add or remove forbidden membership. VLAN-LIST Specify the VLAN list.
Default	No vlan is forbidden by default
Mode	Port Configuration
Usage	<p>Use the switchport forbidden vlan add port configuration command to forbid vlan on interface.</p> <p>Use the switchport forbidden vlan remove port configuration command to accept vlan on interface.</p> <p>You can verify your setting by entering the show interfaces switchport Privileged EXEC command</p>
Example	<p>This example sets the membership of the VLAN 100 with port fa10 to forbidden.</p> <pre> SwitchEF0101(config)# interface fa10 SwitchEF0101(config-if)# switchport forbidden vlan add 100 SwitchEF0101# show interfaces switchport fa10 Port : fa10 Port Mode : Trunk Ingress Filtering : enabled Acceptable Frame Type : all Ingress UnTagged VLAN (NATIVE) : 1 Trunking VLANs Enabled: 100 Port is member in: Vlan Name Egress rule ----- 1 default Untagged Forbidden VLANs: Vlan Name ----- 100 VLAN-one-hundred </pre>

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 s show running-config Privileged EXEC command
Example	This example sets the TPID to 0x9100 on interface fa10. SwitchEF0101(config)# interface fa10 SwitchEF0101(config-if)# switchport vlan tpid 0x9100

management-vlan

Syntax	management-vlan vlan <1-4094> no management-vlan
Parameter	<1-4094> Specify the VLAN ID of management-vlan.
Default	Default management vlan is 1.
Mode	Global Configuration
Usage	Use the management vlan Global Configuration mode command to set management vlan id. Vlan id must be created first. Use the no form of this command to restore to default setting. You can verify your setting by entering the show management-vlan Privileged EXEC command
Example	(1) The following example specifies that management vlan 2 is created Switch(config)#vlan 2 Switch(config)# management-vlan vlan 2 (2)The following example specifies that management-vlan is restored to be default VLAN. Switch(config)# no management-vlan

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	Nones
Mode	Privileged EXEC
Usage	Display information about vlan entry

Example

The following example specifies that show vlan

```
Switch# show vlan
```

```
VID | VLAN Name | Untagged Port | Tagged Port | Type
```

```
-----+-----+-----+-----+-----
 1 | default | fa1-8,fa10-48,lag1-8 | --- | Default
100 | VLAN-one-hundred | --- | --- | Static
101 | VLAN0101 | --- | --- | Static
102 | VLAN0102 | --- | --- | Static
```

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	Nones
Mode	Privileged EXEC
Usage	Display information about vlan membership on interfaces.
Example	The following example specifies that show vlan interface membership Switch# show vlan 100 interfaces fa10 membership VLAN ID : 100 VLAN Type : Static

```

-----+-----
Port   | Membership
-----+-----
fa10  | Excluded
-----+-----

```

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	<p>The following example specifies that show interface switchport.</p> <pre> SwitchEF0101(config)# interface fa10 SwitchEF0101(config-if)# switchport trunk allowed vlan add 100 SwitchEF0101# show interfaces switchport fa10 Port : fa10 Port Mode : Trunk Ingress Filtering : enabled Acceptable Frame Type : all Ingress UnTagged VLAN (NATIVE) : 1 Trunking VLANs Enabled: 100 Port is member in: Vlan Name Egress rule -----+----- 1 default Untagged 100 VLAN-one-hundred Tagged Forbidden VLANs: Vlan Name </pre>

show management-vlan

Syntax	show management-vlan
---------------	-----------------------------

Parameter	None
Default	Nones
Mode	Privileged EXEC
Usage	Display information about management vlan
Example	The following example specifies that show management vlan Switch(config)# show management-vlan Management VLAN-ID : default(1)

36. Voice VLAN

voice-vlan (Global)

Syntax	voice-vlan no voice-vlan
Parameter	
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 Administrate Voice VLAN state : disabled Voice VLAN ID : none (disable) Voice VLAN Aging : 1440 minutes Voice VLAN CoS 6 Voice VLAN 1p Remark: disabled

voice-vlan (Interface)

Syntax	voice-vlan no voice-vlan
Parameter	N/A
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	<p>The following example how to enable voice VLAN function in oui mode on an interface</p> <pre>Switch(config)#interface range fa1-3 Switch(config-if)#voice-vlan Switch# show voice-vlan interfaces fa1-8 Voice VLAN Aging : 1440 minutes Voice VLAN CoS : 7 Voice VLAN 1p Remark: enabled</pre> <p>OUI table</p> <pre>OUI MAC Description -----+----- 00:E0:BB 3COM 00:03:6B Cisco 00:E0:75 Veritel 00:D0:1E Pingtel 00:01:E3 Siemens 00:60:B9 NEC/Philips 00:0F:E2 H3C 00:09:6E Avaya</pre> <p>Port State Port Mode Cos Mode</p> <pre>-----+-----+-----+----- fa1 Disabled Auto Src fa2 Disabled Auto Src fa3 Disabled Auto Src fa4 Disabled Auto Src</pre>

fa5	Disabled	Auto	Src
fa6	Disabled	Auto	Src
fa7	Disabled	Auto	Src
fa8	Disabled	Auto	Src

voice-vlan vlan

Syntax	voice-vlan vlan <1-4094> no voice-vlan vlan
Parameter	<1-4094> Specify the voice VLAN ID
Default	The default Voice VLAN ID is None.
Mode	Global Configuration
Usage	Use the voice vlan id global configuration command to configure the VLAN identifier of the voice VLAN statically. Use the no form of this command to restore voice vlan id to default. You can verify your setting by entering the show voice vlan Privileged EXEC command
Example	The following example shows how to set Voice vlan id. The vlan id must be created first. Switch(config)# voice-vlan vlan 128 Switch# show voice-vlan Administrate Voice VLAN state : enabled Voice VLAN ID 128 Voice VLAN Aging : 1440 minutes Voice VLAN CoS 6 Voice VLAN Ip Remark: disabled

voice-vlan oui-table

Syntax	voice-vlan oui-table A:B:C [DESCRIPTION] no voice-vlan oui-table [A:B:C]
Parameter	A:B:C Specify OUI Mac address to add or remove 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**
Voice VLAN Aging : 1440 minutes
Voice VLAN CoS 6
Voice VLAN 1p Remark: disabled

OUI table
OUI MAC | Description

```
-----+-----
00:E0:BB | 3COM
00:03:6B | Cisco
00:E0:75 | Veritel
00:D0:1E | Pingtel
00:01:E3 | Siemens
00:60:B9 | NEC/Philips
00:0F:E2 | H3C
00:09:6E | Avaya
00:01:02 | Test
```

Port | State | Port Mode | Cos Mode

```
-----+-----+-----+-----
fa1 | Disabled | Auto | Src
fa2 | Disabled | Auto | Src
fa3 | Disabled | Auto | Src
.....
```

voice-vlan cos (Global)

Syntax **voice-vlan cos** <0-7> [remark]
no voice-vlan cos

Parameter	Description
<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 Ip 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 Ip remark function Switch(config)# voice-vlan cos 7 remark Switch# show voice-vlan Administrate Voice VLAN state : disabled Voice VLAN ID 128 Voice VLAN Aging : 1440 minutes Voice VLAN CoS 7 Voice VLAN Ip Remark: enabled

voice-vlan cos (Interface)

Syntax	voice-vlan cos (src all) no voice-vlan cos				
Parameter	<table border="1"> <tr> <td>src</td> <td>Specify QoS attributes are applied to packets with OUIs in the source MAC address.</td> </tr> <tr> <td>All</td> <td>Specify QoS attributes are applied to packets that are classified to the Voice VLAN.</td> </tr> </table>	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.
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 Switch(config)# interface range fa1-3 Switch(config-if)# voice-vlan cos all				

Switch# **show voice-vlan interfaces fa1-8**

Voice VLAN Aging : 1440

minutes Voice VLAN CoS

7

Voice VLAN 1p Remark: enabled

OUI table

OUI MAC | Description

-----+-----

---- 00:E0:BB | 3COM

00:03:6B | Cisco

00:E0:75 | Veritel

00:D0:1E | Pingtel

00:01:E3 | Siemens

00:60:B9 |

NEC/Philips

00:0F:E2 | H3C

00:09:6E | Avaya

Port | State | Port Mode | Cos Mode

-----+-----+-----+-----

fa1 | Disabled | Auto |

All fa2 | Disabled | Auto

| All fa3 | Disabled |

Auto | All fa4 | Disabled

| Auto | Src fa5 |

Disabled | Auto | Src fa6

| Disabled | Auto | Src

fa7 | Disabled | Auto

| Src

fa8 | Disabled | Auto | Src

voice-vlan mode

Syntax **voice-vlan mode (auto|manual)**
no voice-vlan mode

Parameter	auto	manual
	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.	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 shows how to configure voice mode to manual

```
Switch(config)#interface range fa1-3
Switch(config-if)#voice-vlan mode manual
Switch# show voice-vlan interfaces fa1-8
Voice VLAN Aging : 1440 minutes
Voice VLAN CoS : 7
Voice VLAN 1p Remark: enabled
```

OUI table

OUI MAC | Description

```
-----+-----
00:E0:BB | 3COM
00:03:6B | Cisco
00:E0:75 | Veritel
00:D0:1E | Pingtel
00:01:E3 | Siemens
00:60:B9 | NEC/Philips
00:0F:E2 | H3C
00:09:6E | Avaya
```

Port | State | Port Mode | Cos Mode

```
-----+-----+-----+-----
fa1 | Disabled | Manual | Src
fa2 | Disabled | Manual | Src
fa3 | Disabled | Manual | Src
fa4 | Disabled | Auto | Src
fa5 | Disabled | Auto | Src
fa6 | Disabled | Auto | Src
fa7 | Disabled | Auto | Src
fa8 | Disabled | Auto | Src
```

voice-vlan aging-time

Syntax **voice-vlan aing-time** <30-65536>
no voice-vlan aing-time

Parameter <30-65536> Specify the voice VLAN aging timeout interval in minutes

Default	The default aging-timeout value is 1440 minutes
Mode	Global Configuration
Usage	Use the voice vlan aging-time global configuration command to configure the voice VLAN aging timeout. Use the “ no ” form to restore to default time. You can verify your setting by entering the show voice vlan Privileged EXEC command
Example	The following example shows how to set aging time. Switch(config)# voice-vlan aging-time 720 Switch# show voice-vlan Administrate Voice VLAN state : disabled Voice VLAN ID 1 Voice VLAN Aging : 720 minutes Voice VLAN CoS 5 Voice VLAN Ip Remark: enabled

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 Switch# 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
```

```
Switch# show voice-vlan interfaces
fa1-4 Voice VLAN Aging : 720
minutes Voice VLAN CoS 5
Voice VLAN 1p Remark: enabled
```

OUI table

OUI MAC | Description

```
-----+-----
---- 00:E0:BB | 3COM
00:03:6B | Cisco
00:E0:75 | Veritel
00:D0:1E | Pingtel
00:01:E3 | Siemens
00:60:B9 |
NEC/Philips
00:0F:E2 | H3C
00:09:6E | Avaya
```

Port | State | Port Mode | Cos Mode

```
-----+-----+-----+-----
fa1 | Disabled | Auto |
Src fa2 | Disabled | Auto
| Src fa3 | Disabled | Auto |
Src
fa4 | Disabled | Auto | Src
```

37. Static Routing

IPv4 Interface

Syntax

```
interface vlan
ip address ipaddr mask
no interface vlan
no ip address
```

Parameter	<i>ipaddr</i>	Specify IPv4 address for switch
	<i>mask</i>	Specify net mask address for switch

Default The vlan interface and ip address are not configured by default.

Mode

Global configuration and vlan interface configuration.

Usage

Use the **interface vlan** global configuration command to config ip interface on the device.
Use the **ip address** command in vlan interface mode to configure the device's ip address.
Use the **no ip address** command to delete the configured ip address.
Use the **no interface vlan** command to delete ip interface on the device.
You can verify your setting by entering the **show ip interface vlan** Privileged EXEC command.

Example

The following example shows how to config ip interface.
Switch(config)# **interface vlan 2**
Switch(config-if)# **ip address 192.168.3.1 255.255.255.0**
Switch# **show ip interface vlan 2**

IP Address	I/F	I/F Status admin/oper	Type
192.168.3.1/24	VLAN 2	UP/DOWN	Static

Valid

IPv4 Routes

Syntax	ip route <i>dest-ipaddr</i> <i>mask</i> <i>router-ipaddr</i> no ip route <i>dest-ipaddr</i> <i>mask</i> <i>router-ipaddr</i>
Parameter	<i>dest-ipaddr</i> Destination ip address prefix <i>mask</i> Destination ip address prefix mask <i>router-ipaddr</i> Forwarding router's ip address
Default	Static route is not configured by default.
Mode	Global Configuration mode.
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 Codes: > - best, C - connected, S - static S> 1.0.0.0/8 [1/1] via 192.168.3.11, VLAN 2 C> 192.168.0.0/24 is directly connected, MGMT VLAN C> 192.168.3.0/24 is directly connected, VLAN 2
----------------	---

IPv4 ARP

Syntax	arp <i>ip-addr</i> <i>mac-addr</i> vlan <i>vlanid</i> no arp <i>ip-addr</i> <i>mac-addr</i> vlan <i>vlanid</i>
Parameter	<i>ip-addr</i> IP address of ARP entry <i>mac-addr</i> MAC address of ARP entry <i>vlanid</i> Vlan ID of this arp entry
Default	The device contains ARP entries of the vlan interface.

Mode	Global Configuration mode.
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	<p>The following example shows how to configure and view a static arp entry.</p> <pre>Switch(config)# arp 192.168.3.22 00:00:11:11:11:11 vlan 2 Switch# show arp</pre> <table border="1"> <thead> <tr> <th>VLAN</th> <th>Interface</th> <th>IP address</th> <th>HW address</th> <th>Status</th> </tr> </thead> <tbody> <tr> <td>vlan 1</td> <td></td> <td>192.168.0.112</td> <td>00:D0:00:00:00:01</td> <td>Dynamic</td> </tr> <tr> <td>vlan 2</td> <td></td> <td>192.168.3.22</td> <td>00:00:11:11:11:11</td> <td>Static</td> </tr> </tbody> </table>	VLAN	Interface	IP address	HW address	Status	vlan 1		192.168.0.112	00:D0:00:00:00:01	Dynamic	vlan 2		192.168.3.22	00:00:11:11:11:11	Static
VLAN	Interface	IP address	HW address	Status												
vlan 1		192.168.0.112	00:D0:00:00:00:01	Dynamic												
vlan 2		192.168.3.22	00:00:11:11:11:11	Static												

IPv6 Interface

Syntax	<pre>interface vlan <i>vlanid</i> ipv6 enable no interface vlan <i>vlanid</i> no ipv6 enable</pre>		
Parameter	<table border="1"> <tr> <td><i>vlanid</i></td> <td>Vlan id for vlan interface</td> </tr> </table>	<i>vlanid</i>	Vlan id for vlan interface
<i>vlanid</i>	Vlan id for vlan interface		
Default	The vlan interface are not configured by default.Ipv6 is disabled.		
Mode	Global configuration and vlan interface configuration.		
Usage	Use the interface vlan global configuration command to config ip interface on the device. Use the ipv6 enable command in vlan interface mode to enable ipv6 function. Use the no ipv6 enable command to disable ipv6 function. Use the no interface vlan command to delete ip interface on the device. You can verify your setting by entering the show ipv6 interface vlan Privileged EXEC command.		

Example

The following example shows how to config ip interface.

```
Switch(config)# interface vlan 2
Switch(config-if)# ipv6 enable
Switch# show ipv6 interface vlan 2
```

```
VLAN 2 is up/up
IPv6 is enabled, link-local address is fe80::2e0:4cff:fe00:0
IPv6 Forwarding is enabled
No global unicast address is configured
Joined group address(es):
ff02::1:ff00:0
ff02::1
ff01::1
ND DAD is enabled, number of DAD attempts: 1
Stateless autoconfiguration is enabled
```

IPv6 Address

Syntax

```
ipv6 address ipv6-addr
no ipv6 address
```

Parameter

<i>ipv6-addr</i>	Manually configured ipv6 address
------------------	----------------------------------

Default

The vlan interface are not configured by default.Ipv6 is disabled.

Mode

Global configuration and vlan interface configuration.

Usage

Use the **ipv6 address** command in vlan interface mode to config a manual ipv6 address.
 Use the **no ipv6 address** command in vlan interface mode to delete all manual ipv6 addresses on this vlan interface.
 You can verify your setting by entering the **show ipv6 interface vlan** Privileged EXEC command.

Example

The following example shows how to config ip interface.

```
Switch(config)# interface vlan 2
Switch(config-if)# ipv6 address 2001:01::01:01/64
Switch# show ipv6 interface vlan 2
```

```
VLAN 2 is up/up
IPv6 is enabled, link-local address is fe80::2e0:4cff:fe00:0
IPv6 Forwarding is enabled
Global unicast address(es):
IPv6 Global Address                                Type
2001:1::1:1/64                                     Manual
Joined group address(es):
ff02::1:ff01:1
ff02::1:ff00:0
ff02::1
```

ff01::1
ND DAD is enabled, number of DAD attempts: 1
Stateless autoconfiguration is enabled Stateless autoconfiguration is enabled

IPv6 Routes

Syntax	ipv6 route <i>ipv6-addr/length route-ipv6-addr</i> no ipv6 address <i>ipv6-addr/length</i>	
Parameter	<i>ipv6-addr/length</i>	Destination ipv6 prefix and length
	<i>route-ipv6-addr</i>	Forwarding router's ipv6 address
Default	The ipv6 routing entry is not configured by default.	
Mode	Global configuration and vlan interface configuration.	
Usage	Use the ipv6 route command to configure a static ipv6 routing entry. Use the no ipv6 address command to delete a static ipv6 routing entry. You can verify your setting by entering the show ipv6 route static Privileged EXEC command.	
Example	The following example shows how to configure an ipv6 routing entry. Switch(config)# ipv6 route 2002:01::01:01/96 2001:01::01:02 Switch# show ipv6 route static Codes: A - active, I - inactive I 2002:1::/96 [1/1] via 2001:1::1:2, inactive	

IPv6 Neighbors

Syntax	ipv6 neighbor <i>ipv6-addr vlan vlanid macaddr</i> no ipv6 neighbor	
Parameter	<i>ipv6-addr</i>	Neighbor ipv6 address
	<i>vlanid</i>	Vlan interface number
	<i>macaddr</i>	MAC address of ipv6 neighbor entry
Default	No ipv6 neighbor address by default.	
Mode	Global configuration.	
Usage	Use the ipv6 neighbor command to configure a static ipv6 neighbor entry.	

Use the **no ipv6 neighbor** command to delete ipv6 neighbor entry.
You can verify your setting by entering the **show ipv6 neighbors** Privileged EXEC command.

Example

The following example shows how to configure an ipv6 neighbor entry.

```
Switch(config)# ipv6 neighbor 2001:01::01:11 vlan 2
00:00:00:11:11:12
Switch# show ipv6 neighbors
```

VLAN	Interface	IPv6 address	Status	Router State	HW
vlan 2		2001:1::1:11	Static	No	

Total number of entries: 1

38. POE

POE Port Setting

Syntax

poe
no poe

Parameter

Default

All ports are enabled for poe power supply by default.
(Poe-enabled device)

Mode

interface configuration.

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
Get poe power:
```

Port	Enable	State	type	level	actual-current(mA)	volatge(V)	power(mW)

gi1	enable	on	AT	4	676	52
13						
gi2	enable	off	AF	0	N/A	N/A
N/A						
gi3	enable	off	AF	0	N/A	N/A
N/A						
gi4	enable	off	AF	0	N/A	N/A
N/A						
gi5	enable	off	AF	0	N/A	N/A
N/A						
gi6	enable	off	AF	0	N/A	N/A
N/A						
gi7	enable	off	AF	0	N/A	N/A
N/A						
gi8	enable	off	AF	0	N/A	N/A
N/A						

Total used power: 676 (mW)
Current Temperature: 65 (C)

POE Port Schedule Setting

Syntax	poe schedule week <i>days</i> hour <i>hours</i> no poe schedule week <i>days</i> hour <i>hours</i>
Parameter	<i>days</i> Port poe power supply days <i>hours</i> Port poe power supply hours
Default	All ports open POE function all day by default. (Poe-enabled device)
Mode	interface configuration.
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.

39. DNS

ip domain

Syntax	ip domain lookup no ip domain lookup
Parameter	no
Default	disable
Mode	global configuration.
Usage	The DNS server was enabled or disabled.
Example	Enabling the DNS Server Switch(config)# ip domain lookup

ip domain name

Syntax	ip domain name HOSTNAME no ip domain name
Parameter	HOSTNAME Domain name character
Default	no
Mode	global configuration.
Usage	Run the ' ip domain name ' command to The domain name .

Example Set The domain name is test
Switch(config)# **ip domain name test**

ip name-server

Syntax **ip name-server (A.B.C.D|X:X::X:X) [(A.B.C.D|X:X::X:X)]**
[(A.B.C.D|X:X::X:X)] [(A.B.C.D|X:X::X:X)]
no ip name-server (A.B.C.D|X:X::X:X) [(A.B.C.D|X:X::X:X)]
[(A.B.C.D|X:X::X:X)] [(A.B.C.D|X:X::X:X)]

Parameter A.B.C.D Ipv4 address
X:X::X:X Ipv6 address

Default no

Mode global configuration.

Usage Configure the available domain name servers.

Example Set the DNS server to 192.168.2.10.
Switch(config)# **ip name-server 192.168.2.10**

ip host

Syntax **ip host HOSTNAME (A.B.C.D|X:X::X:X)**
no ip host HOSTNAME

Parameter A.B.C.D Ipv4 address
X: X: X: X Ipv6 address
HOSTNAME Domain name String

Default no

Mode global configuration.

Usage Configure the mapping between static domain names and IP address.

Example Set the static mapping between domain name 'test' and IP address '192.168.2.10'.
Switch(config)# **ip host test 192.168.2.10**

show hosts

Syntax `show hosts`

Parameter no

Default no

Mode global configuration.

Usage The DNS configuration information is displayed.

Example The DNS configuration information is displayed.
Switch(config)# **show hosts**

Name/address lookup is enabled

Default Domain Table

Domain	Source	Preference

Name Server Table

IP Address	Source	Preference

192.168.2.10	Static	1

Cache Table

Flags: (STA, OK)

STA - Static

OK - Okay

Host	IP Address	Type	State

test	192.168.2.10	IPv4	STA,OK