
CERIO Corporation

CS-3008XG

8 SFP+ 10Gigabit Port Managed Fiber Optical Switch

Command Line Interface Managed Switch Software

Rev. 2.2

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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>https</td> <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	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	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	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-acl)# sequence 999 permit
22:33:44:55:66:77/FF:FF:FF:FF:FF:FF any vlan 3 ethertype 0x2800
Switch334455(mac-acl)# show acl
MAC access list test
    sequence 999 permit 22:33:44:55:66:77/FF:FF:FF:FF:FF:FF any vlan 3
    ethertype 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.
[ethtype <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 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

```
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
```

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:frag|rsvp|ipv6:icmp|ospf|pim|l2tp|ip)
(A.B.C.D/A.B.C.D|any) (A.B.C.D/A.B.C.D|any)
[(dscp|precedence) VALUE] [shutdown]

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

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

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

no sequence <1-2147483647>
```

Parameter

<1-2147483647>	(Optional) Specify sequence index of ACE, the sequence index represent the priority of an ACE in ACL.
(A.B.C.D/A.B.C.D any)	Specify the source IPv4 address and mask of packet or any IPv4 address.
(A.B.C.D/A.B.C.D any)	Specify the destination IPv4 address 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 '-'. 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	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; border: none;">(mac ip ipv6)</td> <td style="border: none;">Specify a type of ACL to binding to interface</td> </tr> <tr> <td style="border: none;">NAME</td> <td style="border: none;">Specify the name of ACL</td> </tr> </table>	(mac ip ipv6)	Specify a type of ACL to binding to interface	NAME	Specify the name of ACL
(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	<p>The example shows how to bind an existed ACL to interface.</p> <pre>switch(config)# interface fa1 switch(config-if)# mac acl test switch(config-if)# do show running-config interfaces fa1 interface fa1 mac acl test</pre>				

show acl

Syntax	show acl show (mac ip ipv6) acl show (mac ip ipv6) acl NAME				
Parameter	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; border: none;">(mac ip ipv6)</td> <td style="border: none;">Specify a type of ACL to show</td> </tr> <tr> <td style="border: none;">NAME</td> <td style="border: none;">Specify the name of ACL</td> </tr> </table>	(mac ip ipv6)	Specify a type of ACL to show	NAME	Specify the name of ACL
(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 [<i>A.B.C.D</i>]
Parameter	<i>A.B.C.D</i> 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. Switch# clear telnet

enable

Syntax	enable [<1-15>] disable [<1-14>]
Parameter	<1-15> Specify privileged level to enable <1-14> Specify privileged level to disable
Default	Default privilege level is 15 if no privilege level is specified on enable command. Default privilege level is 1 if no privilege level is specified on disable command.
Mode	User EXEC
Usage	In User EXEC mode, user only allows to do a few actions. Most of commands are only available in privileged EXEC mode. Use “ enable ” command to enter the privileged mode to do more actions on switch. In privileged EXEC mode, use “ exit ” command is able to go back to user EXEC mode with original user privilege level. If you need to go back to user EXEC mode with different privilege level, use “ disable ” command to specify the privilege level you need. In privileged EXEC mode, the prompt will show “ Switch# ”
Example	This example shows how to enter privileged EXEC mode and show current privilege level. Switch> enable Switch# show privilege Current CLI Username:

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	<p>This example shows how to modify contact information</p> <pre>Switch(config)# hostname myname myname(config)#</pre>
----------------	---

interface

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

Parameter	<table border="0" style="width: 100%;"> <tr> <td style="width: 20%;"><i>IF_PORTS</i></td> <td>Specify the port to select. This parameter allows partial port name and ignore case. For Example:</td> </tr> <tr> <td></td> <td>fa1</td> </tr> <tr> <td></td> <td>FastEthernet3</td> </tr> <tr> <td></td> <td>Gigabit4</td> </tr> <tr> <td></td> <td>.....</td> </tr> <tr> <td></td> <td>If port range is specified, the list format is also available. For Example:</td> </tr> <tr> <td></td> <td>fa1,3,5</td> </tr> <tr> <td></td> <td>fa2,gi1-3</td> </tr> <tr> <td></td> <td>.....</td> </tr> </table>	<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	
<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	<p>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.</p>
--------------	--

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

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

ip address

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

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</pre> <pre>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	Some configurations are line based. In order to configure these configurations, we need to enter Line Configuration mode to configure them. Use “ line ” command to enter the Line Configuration mode and select the line to be configured. In Line Configuration mode, the prompt will show as “ Switch(config-line)# ”
Example	This example shows how to enter Interface Configuration mode Switch# configure Switch(config)# line console Switch(config-line)#

reboot

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

enable password

Syntax	enable [privilege <1-15>] (password UNENCRYPY-PASSWORD secret UNENCRYPY-PASSWORD secret encrypted ENCRYPT-PASSWORD) no enable [privilege <0-15>]
Parameter	privilege <0-15> Specify the privilege level to configure. If no privilege level is specified, default is 15. password UNENCRYPY- Specify password string and make it not encrypted.

	<i>PASSWORD</i>	
	secret <i>UNENCRYPT- 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 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**

---

|                  |                                                                                                                                                                                                                            |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Parameter</b> |                                                                                                                                                                                                                            |
| <b>Default</b>   | No default value for this command.                                                                                                                                                                                         |
| <b>Mode</b>      | User EXEC<br>Privileged EXEC                                                                                                                                                                                               |
| <b>Usage</b>     | Use “ <b>show ip</b> ” command to show system IPv4 address, net mask and default gateway.                                                                                                                                  |
| <b>Example</b>   | <hr/> <p>This example shows how to show current ipv4 address of the switch.</p> <pre>Switch# <b>show ip</b><br/>IP Address: 192.168.1.200<br/>Subnet Netmask: 255.255.255.0<br/>Default Gateway: 192.168.1.254</pre> <hr/> |

## show ip dhcp

---

|                  |                                                                                                                                                             |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>show ip dhcp</b>                                                                                                                                         |
| <b>Parameter</b> |                                                                                                                                                             |
| <b>Default</b>   | No default value for this command.                                                                                                                          |
| <b>Mode</b>      | User EXEC<br>Privileged EXEC                                                                                                                                |
| <b>Usage</b>     | Use “ <b>show ip dhcp</b> ” command to show IPv4 dhcp client enable state.                                                                                  |
| <b>Example</b>   | <hr/> <p>This example shows how to show current dhcp client state of the switch.</p> <pre>Switch# <b>show ip dhcp</b><br/>DHCP Status : enabled</pre> <hr/> |

## show ip dns

---

|                  |                    |
|------------------|--------------------|
| <b>Syntax</b>    | <b>show ip dns</b> |
| <b>Parameter</b> |                    |

---

|                |                                                                                                                                                                                                  |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Default</b> | No default value for this command.                                                                                                                                                               |
| <b>Mode</b>    | User EXEC<br>Privileged EXEC                                                                                                                                                                     |
| <b>Usage</b>   | Use “ <b>show ip dns</b> ” command to show system IPv4 DNS addresses.                                                                                                                            |
| <b>Example</b> | <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

---

|                  |                                                                                                                                                                                                                                                         |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>show ip (http https)</b>                                                                                                                                                                                                                             |
| <b>Parameter</b> |                                                                                                                                                                                                                                                         |
| <b>Default</b>   | No default value for this command.                                                                                                                                                                                                                      |
| <b>Mode</b>      | Privileged EXEC                                                                                                                                                                                                                                         |
| <b>Usage</b>     | Use “ <b>show ip http</b> ” command to show HTTP/HTTPS information.                                                                                                                                                                                     |
| <b>Example</b>   | <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

---

|                  |                  |
|------------------|------------------|
| <b>Syntax</b>    | <b>show ipv6</b> |
| <b>Parameter</b> |                  |

|                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Default</b> | No default value for this command.                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Mode</b>    | User EXEC<br>Privileged EXEC                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Usage</b>   | Use “ <b>show ipv6</b> ” command to show system IPv6 address, net mask, default gateway and auto config state.                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Example</b> | <p>This example shows how to show current ipv6 address of the switch.</p> <pre>Switch# <b>show ipv6</b> 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:4b3c/128 IPv6 static Gateway Address  : :: IPv6 in use Address          : fe80::dcad:beff:feef:102/64 IPv6 in use Gateway Address  : ::</pre> |

## show ipv6 dhcp

|                  |                                                                                                                                                   |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>show ipv6 dhcp</b>                                                                                                                             |
| <b>Parameter</b> |                                                                                                                                                   |
| <b>Default</b>   | No default value for this command.                                                                                                                |
| <b>Mode</b>      | User EXEC<br>Privileged EXEC                                                                                                                      |
| <b>Usage</b>     | Use “ <b>show ipv6 dhcp</b> ” command to show system IPv6 dhcp client enable state.                                                               |
| <b>Example</b>   | <p>This example shows how to show current dhcpv6 client state of the switch.</p> <pre>Switch# <b>show ipv6 dhcp</b> DHCPv6 Status : enabled</pre> |

## show line

|                  |                                             |
|------------------|---------------------------------------------|
| <b>Syntax</b>    | <b>show line [(console   telnet   ssh)]</b> |
| <b>Parameter</b> | <b>console</b> Select console line to show. |

|               |                             |
|---------------|-----------------------------|
| <b>telnet</b> | Select telnet line to show. |
| <b>ssh</b>    | 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** This example shows how to show system version.

```
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
```

---

## silent-time

---

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

---

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

---

---

**Default** Default silent time is 0.

---

**Mode** Line Configuration

---

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

---

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

```
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
```

This example shows how show line information.

```
Switch# show line
Console =====
 Session Timeout : 10 (minutes)
```

---



## 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*

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Parameter</b> | <i>NAME</i> Specify system name string.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Default</b>   | Default name string is “Switch”.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Mode</b>      | Global Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Usage</b>     | Use “ <b>system name</b> ” command to modify system name information of the switch. The system name is also used to be CLI prompt.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Example</b>   | <p>This example shows how to modify contact information</p> <pre>Switch(config)# <b>system name myname</b> myname(config)#</pre> <p>This example shows how to show system name information</p> <pre>Switch# <b>show info</b> 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

|                  |                                                                                    |
|------------------|------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>system contact</b> <i>CONTACT</i>                                               |
| <b>Parameter</b> | <i>CONTACT</i> Specify contact string.                                             |
| <b>Default</b>   | Default contact string is “Default Contact”.                                       |
| <b>Mode</b>      | Global Configuration                                                               |
| <b>Usage</b>     | Use “ <b>system contact</b> ” 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

|                  |                                                                                                                                                                                                                                            |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>terminal length</b> <0-24>                                                                                                                                                                                                              |
| <b>Parameter</b> | <0-24> Specify terminal length value. 0 means no limit.                                                                                                                                                                                    |
| <b>Default</b>   | Default terminal length is 24.                                                                                                                                                                                                             |
| <b>Mode</b>      | User EXEC<br>Privileged EXEC                                                                                                                                                                                                               |
| <b>Usage</b>     | Use “ <b>terminal length</b> ” command to specify the maximum line number the terminal is able to print.                                                                                                                                   |
| <b>Example</b>   | <pre>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--</pre> |

## username

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

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Parameter</b> | <p><b>mac-case (lower upper)</b> Select radius user id to be upper case or lower case.</p> <p><b>mac-delimiter (colon dot hyphen none)</b> Select radius user id delimiter<br/>         colon: XX:XX:XX:XX:XX:XX<br/>         dot: XX.XX.XX.XX.XX.XX<br/>         hyphen: XX-XX-XX-XX-XX-XX<br/>         none: XXXXXXXXXXXXX</p> <p><b>gap (2 4 6)</b> Select delimiter gap<br/>         2: XX-XX-XX-XX-XX-XX<br/>         4: XXXX-XXXX-XXXX<br/>         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**

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

|                                          |                                                       |
|------------------------------------------|-------------------------------------------------------|
| <b>control unauth</b>                    | Host with this MAC address will be force-unauthorized |
| <b>vlan</b> <1-4094>                     | MAC Authentication host assigned VLAN                 |
| <b>reauth-period</b><br><300-4294967294> | MAC Authentication host reauthentication period       |
| <b>inactive-timeout</b><br><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.                                                                                     |
| <b>multi-host</b>  | Multiple Host Mode. In this mode, only one client need to be authenticated and other clients will get the same access accessibility.                     |
| <b>single-host</b> | 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 fa1
Switch(config-if)# authentication max-hosts 100
Switch# show mac-auth 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 : 100
.....
```

## authentication method

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

| Parameter | local                             | radius                                   |
|-----------|-----------------------------------|------------------------------------------|
|           | Use local account to authenticate | 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 fa1
Switch(config-if)# authentication method local radius
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 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.

---

|                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Default</b> | Default is disabled.                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Mode</b>    | Interface Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Usage</b>   | Use “ <b>authentication port-control</b> ” command to enable the port authentication control mode.<br>Use the <b>no</b> form of this command to disable authentication port control.                                                                                                                                                                                                                                                                           |
| <b>Example</b> | <p>The following example shows how to configure port control to auto mode.</p> <pre>Switch(config)# <b>interface fal</b> Switch(config-if)# <b>authentication port-control auto</b> Switch# <b>show authentication interface fal</b> Interface FastEthernet1   Admin Control           : auto   Host Mode               : multi-auth   Type dot1x State       : disabled   Type mac State          : disabled   Type web State          : disabled .....</pre> |

## authentication radius-attributes vlan

|                  |                                                                                                                                                                                                                                                                                                                                                                                                   |               |                                                                                                                                                 |               |                                                                                                                                 |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------|---------------|---------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>authentication radius-attributes vlan (reject   static)</b><br><b>no authentication radius-attributes vlan</b>                                                                                                                                                                                                                                                                                 |               |                                                                                                                                                 |               |                                                                                                                                 |
| <b>Parameter</b> | <table border="1"> <tr> <td><b>reject</b></td> <td>If get VLAN authorized information, just use it. However, if there is no VLAN authorized information, reject the host and make it unauthorized.</td> </tr> <tr> <td><b>static</b></td> <td>If get VLAN authorized information, just use it. If there is no VLAN authorized information, <u>keep original VLAN of host.</u></td> </tr> </table> | <b>reject</b> | If get VLAN authorized information, just use it. However, if there is no VLAN authorized information, reject the host and make it unauthorized. | <b>static</b> | If get VLAN authorized information, just use it. If there is no VLAN authorized information, <u>keep original VLAN of host.</u> |
| <b>reject</b>    | If get VLAN authorized information, just use it. However, if there is no VLAN authorized information, reject the host and make it unauthorized.                                                                                                                                                                                                                                                   |               |                                                                                                                                                 |               |                                                                                                                                 |
| <b>static</b>    | If get VLAN authorized information, just use it. If there is no VLAN authorized information, <u>keep original VLAN of host.</u>                                                                                                                                                                                                                                                                   |               |                                                                                                                                                 |               |                                                                                                                                 |
| <b>Default</b>   | Default radius attributes VLAN assign mode is static.                                                                                                                                                                                                                                                                                                                                             |               |                                                                                                                                                 |               |                                                                                                                                 |
| <b>Mode</b>      | Interface Configuration                                                                                                                                                                                                                                                                                                                                                                           |               |                                                                                                                                                 |               |                                                                                                                                 |
| <b>Usage</b>     | Use “ <b>authentication radius-attributes vlan</b> ” command to configure the port RADIUS VLAN assign mode.<br>Use the <b>no</b> 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

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>authentication timer inactive &lt;60-65535&gt;</b><br><b>no authentication timer inactive</b>                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Parameter</b> | <60-65535> Interval in seconds after which if there is no activity from the client then it will be unauthorized                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Default</b>   | Default inactive timeout is 60 seconds.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Mode</b>      | Interface Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Usage</b>     | Use “ <b>authentication timer inactive</b> ” command to configure the port inactive timeout value.<br>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.<br>Use <b>no</b> form of this command to restore default value.                                                                                                                                     |
| <b>Example</b>   | The following example shows how to configure port inactive period.<br>Switch(config)# <b>interface fal</b><br>Switch(config-if)# <b>authentication timer inactive 300</b><br>Switch# <b>show authentication interface fal</b><br>Interface FastEthernet1<br>.....<br>Common Timers<br>Reauthenticate Period: 300<br>Inactive Timeout : 300 Quiet<br>Period : 60<br>802.1x Parameters<br>EAP Max Request : 2<br>EAP TX Period : 30<br>Supplicant Timeout : 30<br>Server Timeout : 30<br>Web-auth Parameters<br>Login Attempt : 3 |

## authentication timer quiet

|                  |                                                                                           |
|------------------|-------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>authentication timer quiet &lt;0-65535&gt;</b><br><b>no authentication timer quiet</b> |
| <b>Parameter</b> | <0-65535> Interval in seconds to wait following a failed authentication exchange          |

|                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Default</b> | Default quiet period is 60 seconds.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Mode</b>    | Interface Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Usage</b>   | <p>Use “<b>authentication timer quiet</b>” 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 <b>no</b> form of this command to restore default value.</p>                                                                                                                                              |
| <b>Example</b> | <p>The following example shows how to configure port quiet period.</p> <pre>Switch(config)# <b>interface fa1</b> Switch(config-if)# <b>authentication timer quiet 300</b> Switch# <b>show authentication interface fa1</b> 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

|                               |                                                                                                                                                                                                                                           |                               |                                                                                |
|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|--------------------------------------------------------------------------------|
| <b>Syntax</b>                 | <b>authentication timer reauth</b> <300-4294967294><br><b>no authentication timer reauth</b>                                                                                                                                              |                               |                                                                                |
| <b>Parameter</b>              | <table border="0" style="width: 100%;"> <tr> <td style="width: 35%;"><b>&lt;300-4294967294&gt;</b></td> <td>Time in seconds after which an automatic re-authentication should be initiated</td> </tr> </table>                            | <b>&lt;300-4294967294&gt;</b> | Time in seconds after which an automatic re-authentication should be initiated |
| <b>&lt;300-4294967294&gt;</b> | Time in seconds after which an automatic re-authentication should be initiated                                                                                                                                                            |                               |                                                                                |
| <b>Default</b>                | Default reauthentication period is 3600 seconds.                                                                                                                                                                                          |                               |                                                                                |
| <b>Mode</b>                   | Interface Configuration                                                                                                                                                                                                                   |                               |                                                                                |
| <b>Usage</b>                  | <p>Use “<b>authentication timer reauth</b>” 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                       |
| <b>encrypted</b> <i>CRYPT-PASSWORD</i> | Encrypted password.                           |
| <i>PASSWORD</i>                        | Un-encrypted password.                        |
| <b>vlan</b> <1-4094>                   | Assigned VLAN of this local account           |
| <b>reauth-period</b> <300-4294967294>  | Reauthentication period of this local account |
| <b>inactive-timeout</b> <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<br>Period | Inactive<br>Timeout |
|-----------|-------|------------------|---------------------|
| -----     | ----- | -----            | -----               |
| 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**

|                     |                                    |
|---------------------|------------------------------------|
| <b>infinite</b>     | Do not care user login fail number |
| <b>&lt;3-10&gt;</b> | 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                            |  |                                                 |
|--------------------------------------|--|-------------------------------------------------|
| <b>interfaces</b><br><i>IF_PORTS</i> |  | Clear sessions on specific interface            |
| <b>mac</b> <i>mac-addr</i>           |  | Clear session with specific MAC address         |
| <b>session-id</b> <i>WORD</i>        |  | Clear session with specific session ID          |
| <b>type</b><br>(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

---

|                |                                                                                                                                                                                                                                                                                                                                |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Mode</b>    | Global Configuration                                                                                                                                                                                                                                                                                                           |
| <b>Usage</b>   | Use “ <b>dot1x</b> ” command to enable the global setting of 802.1x. The “ <b>authentication dot1x</b> ” command has the same effect as this one. This command is a backward compatible command. Use the <b>no</b> form of this command to disable 802.1x authentication.                                                      |
| <b>Example</b> | <p>The following example shows how to enable 802.1x authentication.</p> <pre>Switch(config)# dot1x Switch# show authentication Autentication 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

---

|                  |                                                                                                                                                                                                                                                                                                                                                                             |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>dot1x guest-vlan &lt;1-4094&gt;</b><br><b>no dot1x guest-vlan</b>                                                                                                                                                                                                                                                                                                        |
| <b>Parameter</b> | <1-4094> Guest VLAN ID                                                                                                                                                                                                                                                                                                                                                      |
| <b>Default</b>   | Default guest VLAN is disabled                                                                                                                                                                                                                                                                                                                                              |
| <b>Mode</b>      | Global Configuration                                                                                                                                                                                                                                                                                                                                                        |
| <b>Usage</b>     | Use “ <b>dot1x guest-vlan</b> ” command to enable the global setting of guest VLAN and specify guest VLAN ID. Use the <b>no</b> form of this command to disable guest VLAN.                                                                                                                                                                                                 |
| <b>Example</b>   | <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

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>dot1x max-req</b> <1-10><br><b>no dot1x max-req</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Parameter</b> | <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>                                                                                                                                                                                                                                                                                                                 |
| <b>Default</b>   | Default EAP max request number is 2.                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Mode</b>      | Interface Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Usage</b>     | Use “ <b>dot1x max-req</b> ” 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 <b>no</b> form of this command to restore default value.                                                                                                                                                           |
| <b>Example</b>   | <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

|               |                                                                                          |
|---------------|------------------------------------------------------------------------------------------|
| <b>Syntax</b> | <b>dot1x port-control</b> (auto force-auth force-unauth)<br><b>no dot1x port-control</b> |
|---------------|------------------------------------------------------------------------------------------|



|                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                           |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| <b>Parameter</b>    | <b>auto</b>                                                                                                                                                                                                                                                                                                                                                                                                                                        | Need passing authentication procedure to get network accessibility        |
| <b>force-auth</b>   | <b>force-auth</b>                                                                                                                                                                                                                                                                                                                                                                                                                                  | Port is force authorized and all clients have network accessibility.      |
| <b>force-unauth</b> | <b>force-unauth</b>                                                                                                                                                                                                                                                                                                                                                                                                                                | Port is force unauthorized and all clients have no network accessibility. |
| <b>Default</b>      | Default is disabled.                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                           |
| <b>Mode</b>         | Interface Configuration                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                           |
| <b>Usage</b>        | Use “ <b>dot1x port-control</b> ” command to enable the port authentication control mode. The “ <b>authentication port-control</b> ” command has the same effect. Use the <b>no</b> form of this command to disable authentication port control.                                                                                                                                                                                                   |                                                                           |
| <b>Example</b>      | <p>The following example shows how to configure port control to auto mode.</p> <pre>Switch(config)# <b>interface fa1</b> Switch(config-if)# <b>dot1x port-control auto</b> Switch# <b>show authentication interface fa1</b> Interface FastEthernet1   Admin Control           : auto   Host Mode               : multi-auth   Type dot1x State       : enabled   Type mac State         : disabled   Type web State         : disabled .....</pre> |                                                                           |

## dot1x reauth

|                  |                                                                                                                                                                                                                                                       |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>dot1x reauth</b><br><b>no dot1x reauth</b>                                                                                                                                                                                                         |
| <b>Parameter</b> |                                                                                                                                                                                                                                                       |
| <b>Default</b>   | Default is disabled.                                                                                                                                                                                                                                  |
| <b>Mode</b>      | Interface Configuration                                                                                                                                                                                                                               |
| <b>Usage</b>     | Use “ <b>dot1x reauth</b> ” command to enable the port reauthentication. The “ <b>authentication reauth</b> ” command has the same effect, it is a backward compatible command<br>Use the <b>no</b> form of this command to disable reauthentication. |

|                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Example</b> | <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

|                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                               |                                                                                |
|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|--------------------------------------------------------------------------------|
| <b>Syntax</b>                 | <pre>dot1x timeout reauth-period &lt;300-4294967294&gt; no dot1x timeout reauth-period</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                               |                                                                                |
| <b>Parameter</b>              | <table border="1"> <tr> <td style="vertical-align: top;"><b>&lt;300-4294967294&gt;</b></td> <td>Time in seconds after which an automatic re-authentication should be initiated</td> </tr> </table>                                                                                                                                                                                                                                                                                                                                                             | <b>&lt;300-4294967294&gt;</b> | Time in seconds after which an automatic re-authentication should be initiated |
| <b>&lt;300-4294967294&gt;</b> | Time in seconds after which an automatic re-authentication should be initiated                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                               |                                                                                |
| <b>Default</b>                | Default reauthentication period is 3600 seconds.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                               |                                                                                |
| <b>Mode</b>                   | Interface Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                               |                                                                                |
| <b>Usage</b>                  | <p>Use “<b>dot1x timeout reauth</b>” 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 “<b>authentication timer reauth</b>” command has the same effect and it is a backward compatible command.</p> <p>Use <b>no</b> form of this command to restore default value.</p> |                               |                                                                                |
| <b>Example</b>                | <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**

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                 |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| <b>Parameter</b> | <code>&lt;1-65535&gt;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Number of seconds that lapses before the device resends a request to the authentication server. |
| <b>Default</b>   | Default server timeout is 30 seconds.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                 |
| <b>Mode</b>      | Interface Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                 |
| <b>Usage</b>     | Use “ <b>dot1x timeout server-timeout</b> ” 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 <b>no</b> form of this command to restore default value.                                                                                                                                                                                                                                 |                                                                                                 |
| <b>Example</b>   | <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**

|                  |                                                                                           |                                                                                |
|------------------|-------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>dot1x timeout supp-timeout &lt;1-65535&gt;</b><br><b>no dot1x timeout supp-timeout</b> |                                                                                |
| <b>Parameter</b> | <code>&lt;1-65535&gt;</code>                                                              | Number of seconds that lapses before EAP requests are resent to the supplicant |
| <b>Default</b>   | Default supplicant timeout is 30 seconds.                                                 |                                                                                |
| <b>Mode</b>      | Interface Configuration                                                                   |                                                                                |

|                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Usage</b>   | Use “ <b>dot1x timeout supp-timeout</b> ” 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 <b>no</b> form of this command to restore default value.                                                                                                                                                                                                                                                     |
| <b>Example</b> | <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

|                        |                                                                                                                                                                                                                                                                                                                                                                            |                        |                                                                                                                                                                                         |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>          | <b>dot1x timeout tx-period</b> <1-65535><br><b>no dot1x timeout tx-period</b>                                                                                                                                                                                                                                                                                              |                        |                                                                                                                                                                                         |
| <b>Parameter</b>       | <table border="0" style="width: 100%;"> <tr> <td style="width: 20%; vertical-align: top;"><b>&lt;1-65535&gt;</b></td> <td>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.</td> </tr> </table>                                      | <b>&lt;1-65535&gt;</b> | 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. |
| <b>&lt;1-65535&gt;</b> | 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.                                                                                                                                                                                    |                        |                                                                                                                                                                                         |
| <b>Default</b>         | Default EAP TX period is 30 seconds.                                                                                                                                                                                                                                                                                                                                       |                        |                                                                                                                                                                                         |
| <b>Mode</b>            | Interface Configuration                                                                                                                                                                                                                                                                                                                                                    |                        |                                                                                                                                                                                         |
| <b>Usage</b>           | Use “ <b>dot1x timeout tx-period</b> ” 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 <b>no</b> form of this command to restore default value. |                        |                                                                                                                                                                                         |
| <b>Example</b>         | <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**



---

|                  |                                                                                                                                                                                                                                        |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>show authentication sessions [detail]</b><br><b>show authentication sessions interface <i>IF_PORTS</i></b><br><b>show authentication sessions session-id <i>WORD</i></b><br><b>show authentication session type (dot1x mac web)</b> |
| <b>Parameter</b> | <b>detail</b> Show session detail information.<br><b>interface</b> Show session detail information of specific                                                                                                                         |

---

|                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                 |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|
|                | <i>IF_PORTS</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | port                                                            |
|                | <b>session-id</b> <i>WORD</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Show session detail information of specific session id          |
|                | <b>type</b><br><b>(dot1x mac web)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Show session detail information of specific authentication type |
| <b>Default</b> | No default value for this command.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                 |
| <b>Mode</b>    | Privileged EXEC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                 |
| <b>Usage</b>   | Use “ <b>show authentication sessions</b> ” command to show authentication detail session information.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                 |
| <b>Example</b> | <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

|                  |                                                      |                                                                                                               |
|------------------|------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>show cable-diag interfaces</b> <i>IF_NMLPORTS</i> |                                                                                                               |
| <b>Parameter</b> | <b>interfaces</b><br><i>IF_NMLPORTS</i>              | Display the cable diagnostic information of the copper media for an interface ID or a list of interfaces IDs. |
| <b>Default</b>   | N/A                                                  |                                                                                                               |

|              |                                                                                                                                                                                                                                             |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Mode</b>  | Privileged EXEC                                                                                                                                                                                                                             |
| <b>Usage</b> | To show the estimated copper cable length attached to a specific interface, use the command <b>show cable-diag</b> in the Privileged EXEC mode. For the proper information of the cable length, the interface must be active and linked up. |

|                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Example</b> | <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

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

**Example** The following example shows the diagnostic information for the interface gi1 and gi2, where 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

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>ip dhcp snooping</b><br><b>no ip dhcp snooping</b>                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Parameter</b> | None                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Default</b>   | DHCP snooping is disabled                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Mode</b>      | Global Configuration                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Usage</b>     | Use the ip dhcp snooping command to enable DHCP Snooping function. Use the no form of this command to disable.                                                                                                                                                                                                                                                                                                                        |
| <b>Example</b>   | The example shows how to enable DHCP Snooping on VLAN 1. You can verify settings by the following show ip dhcp snooping command.<br><br><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

|                  |                                                                                                  |
|------------------|--------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>ip dhcp snooping vlan VLAN-LIST</b>                                                           |
| <b>Parameter</b> | <b>VLAN-LIST</b> Specify VLAN ID or a range of VLANs to enable or disable dynamic Arp inspection |

|                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Default</b> | Default is disabled on all VLANs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Mode</b>    | Global Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Usage</b>   | Use the <b>ip dhcp snooping vlan</b> command to enable VLANs on DHCP Snooping function. Use the <b>no</b> form of this command to disable VLANs on DHCP Snooping function.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Example</b> | <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 <b>show ip dhcp snooping</b> command.</p> <pre> switch(config)# <b>vlan 1-100</b> switch(config)# <b>exit</b> switch(config)# <b>ip dhcp snooping</b> switch(config)# <b>ip dhcp snooping vlan 1-100</b> switch(config)# <b>show ip dhcp snooping</b> 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)# <b>no ip dhcp snooping vlan 30-40</b> switch(config)# <b>show ip dhcp snooping</b> 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

|                  |                                                                             |
|------------------|-----------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>ip dhcp snooping</b><br><b>trust no ip dhcp</b><br><b>snooping trust</b> |
| <b>Parameter</b> | None                                                                        |
| <b>Default</b>   | DHCP snooping trust is disabled                                             |
| <b>Mode</b>      | 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

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>ip dhcp snooping rate-limit</b><br><1-300> [no] ip dhcp snooping rate-limit                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Parameter</b> | <1-300> Set 1 to 300 PPS of DHCP packet rate limitation                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Default</b>   | Default is un-limited of DHCP packet                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Mode</b>      | Interface Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Usage</b>     | Use the <b>ip dhcp snooping rate-limit</b> command to set rate limitation on interface. The switch drop DHCP packets after receives more than configured rate of packets per second. Use the <b>no</b> form of this command to return to default settings.                                                                                                                                                                                                                        |
| <b>Example</b>   | <p>The example shows how to set rate limit to 30 pps on interface gi1. You can verify settings by the following <b>show ip dhcp snooping interface</b> 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

|                  |                                                                                                                                                                 |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>clear ip dhcp snooping interfaces IF_PORTS statistics</b>                                                                                                    |
| <b>Parameter</b> | IF_PORTS specifies ports to clear statistics                                                                                                                    |
| <b>Default</b>   | No default is defined                                                                                                                                           |
| <b>Mode</b>      | Privileged EXEC                                                                                                                                                 |
| <b>Usage</b>     | Use the <b>clear ip dhcp snooping interfaces statistics</b> command to clear statistics that are recorded on interface.                                         |
| <b>Example</b>   | The example shows how to clear statistics on interface gi1. You can verify settings by the following <b>show ip dhcp snooping interface statistics</b> 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

|                  |                                                                                                                                                                                                                                                                                         |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>show ip dhcp snooping</b>                                                                                                                                                                                                                                                            |
| <b>Parameter</b> | <b>None</b>                                                                                                                                                                                                                                                                             |
| <b>Default</b>   | No default is defined                                                                                                                                                                                                                                                                   |
| <b>Mode</b>      | Privileged EXEC                                                                                                                                                                                                                                                                         |
| <b>Usage</b>     | Use the <b>show ip dhcp snooping</b> command to show settings of DHCP Snooping.                                                                                                                                                                                                         |
| <b>Example</b>   | <p>The example shows how to show settings of DHCP Snooping</p> <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

|                  |                                                                                                                 |
|------------------|-----------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>show ip dhcp snooping interfaces IF_PORTS</b><br><b>show ip dhcp snooping interfaces IF_PORTS statistics</b> |
| <b>Parameter</b> | <b>IF_PORTS</b> specifies ports to show statistics                                                              |
| <b>Default</b>   | No default is defined                                                                                           |
| <b>Mode</b>      | 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**

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Parameter</b> | None                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Default</b>   | DHCP snooping option82 is disabled                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Mode</b>      | Interface Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Usage</b>     | Use the <b>ip dhcp snooping option</b> command to enable that insert option82 content into packet. Use the <b>no</b> form of this command to disable.                                                                                                                                                                                                                                                                                                    |
| <b>Example</b>   | <p>The example shows how to enable option82 insertion. You can verify settings by the following <b>show ip dhcp snooping interface</b> 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

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

---

|                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Default</b> | DHCP snooping database is disabled                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Mode</b>    | Global Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Usage</b>   | Use the <b>ip dhcp snooping database</b> command to enable DHCP Snooping database agent. The “ <b>flash</b> ” means that write backup file to switch local drive. The “ <b>tftp</b> ” means that write backup file to remote TFTP server. Use the <b>no</b> form of this command to disable.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Example</b> | <p>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 <b>show ip dhcp snooping database</b> command.</p> <pre>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</pre> |

---

## ip dhcp snooping database write-delay

---

|                  |                                                                                                                                                            |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>ip dhcp snooping database write-delay</b><br><b>&lt;15-86400&gt; no ip dhcp snooping database write-delay</b>                                           |
| <b>Parameter</b> | <b>&lt;15-86400&gt;</b> 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

---

---

|                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Default</b> | DHCP snooping database timeout is 300 seconds                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Mode</b>    | Global Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Usage</b>   | Use the <b>ip dhcp snooping database timeout</b> command to modify the timeout timer. Use the <b>no</b> form of this command to default setting.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Example</b> | <p>The example shows how to set timeout timer to 60 seconds. You can verify settings by the following <b>show ip dhcp snooping database</b> 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

---

|                  |                                                   |
|------------------|---------------------------------------------------|
| <b>Syntax</b>    | <b>clear ip dhcp snooping database statistics</b> |
| <b>Parameter</b> | None                                              |
| <b>Default</b>   | No default is defined                             |
| <b>Mode</b>      | 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**

|                              |                                                                                                                                                                          |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>daeqlsa-deny</b>          | Drops the packets if the destination MAC address is equal to the source MAC address.                                                                                     |
| <b>icmp-frag-pkts-deny</b>   | Drops the fragmented ICMP packets.                                                                                                                                       |
| <b>icmpv4-ping-max-check</b> | Checks the maximum size of ICMP ping packets, and drops the packets larger than the maximum packet size defined by the command <b>dos icmp-ping-max-length MAX_LEN</b> . |

|                                                 |                                                                                                                                                                                   |
|-------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>icmpv6-ping-max-check</b>                    | Checks the maximum size of ICMPv6 ping packets, and drops the packets larger than the maximum packet size defined by the command <b>dos icmp-ping-max-length</b> <i>MAX_LEN</i> . |
| <b>ipv6-min-frag-size-check</b>                 | Checks the minimum size of IPv6 fragments, and drops the packets smaller than the minimum size defined by the command <b>dos ipv6-min-frag-size-length</b> <i>MIN_LEN</i> .       |
| <b>land-deny</b>                                | Drops the packets if the source IP address is equal to the destination IP address.                                                                                                |
| <b>nullscan-deny</b>                            | Drops the packets with NULL scan.                                                                                                                                                 |
| <b>pod-deny</b>                                 | Avoids ping of death attack.                                                                                                                                                      |
| <b>smurf-deny</b>                               | Avoids smurf attack.                                                                                                                                                              |
| <b>syn-sport1024-deny</b>                       | Drops SYN packets with sport less than 1024.                                                                                                                                      |
| <b>synfin-deny</b>                              | Drops the packets with SYN and FIN bits set.                                                                                                                                      |
| <b>synrst-deny</b>                              | Drops the packets with SYN and RST bits set.                                                                                                                                      |
| <b>tcp-frag-off-min-check</b>                   | Drops the TCP fragment packets with offset equals to one.                                                                                                                         |
| <b>tcpblat-deny</b>                             | Drops the packages if the TCP source port is equal to the TCP destination port.                                                                                                   |
| <b>tcphdr-min-check</b>                         | Checks the minimum TCP header and drops the TCP packets with the header smaller than the minimum size defined by the command <b>dos tcphdr-min-length</b> <i>HDR_MIN_LEN</i> .    |
| <b>udpblat-deny</b>                             | Drops the packets if the UDP source port equals to the UDP destination port.                                                                                                      |
| <b>xmas-deny</b>                                | Drops the packets if the sequence number is zero, and the FIN, URG and PSH bits are set.                                                                                          |
| <b>icmp-ping-max-length</b> <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.                                         |
| <b>ipv6-min-frag-size-length</b> <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.                                                            |
| <b>smurf-netmask</b> <i>MASK</i>                | Specify the netmask of smurf attack. The length range is from 0 to 323 bytes, and default length is 0 bytes.                                                                      |
| <b>tcphdr-min-length</b> <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.

|                |                                                                                                                                                                                                                                                  |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Mode</b>    | Global Configuration                                                                                                                                                                                                                             |
| <b>Usage</b>   | To enable the specific Deniel of Service (DoS) protection, use the command <b>dos</b> in the Global Configuration mode. Otherwise, use the <b>no</b> form of the command to disable the specific DoS protection.                                 |
| <b>Example</b> | <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)

|                  |                                                                                                                                                                                                    |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>dos</b><br><b>no dos</b>                                                                                                                                                                        |
| <b>Parameter</b> | N/A                                                                                                                                                                                                |
| <b>Default</b>   | DoS protection is disabled on each interface.                                                                                                                                                      |
| <b>Mode</b>      | Interface Configuration                                                                                                                                                                            |
| <b>Usage</b>     | To enable the DoS on the specific interface, use the command <b>dos</b> in the Interface Configuration mode. Otherwise, use the <b>no</b> form of the command to disable the DoS on the interface. |
| <b>Example</b>   | <p>The following example enables the DoS on the interface fa1.</p> <pre>Switch(config)# interface fa1 Switch(config-if)# dos</pre>                                                                 |

## show dos

|                  |                                                                                          |
|------------------|------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>show dos</b><br><b>show dos interface <i>IF_PORTS</i></b>                             |
| <b>Parameter</b> | <b>interface</b> An interface ID or the list of interface IDs.<br><b><i>IF_PORTS</i></b> |
| <b>Default</b>   | N/A                                                                                      |

|              |                                                                                                                                                                                                                                   |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Mode</b>  | Privileged EXEC                                                                                                                                                                                                                   |
| <b>Usage</b> | To show the DoS protection configuration, use the command <b>show dos</b> in the Privileged EXEC mode. For the status of DoS protection on each interface, use the command <b>show dos interface</b> 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

|                  |                                               |
|------------------|-----------------------------------------------|
| <b>Syntax</b>    | <b>ip arp inspection no ip arp inspection</b> |
| <b>Parameter</b> | None                                          |
| <b>Default</b>   | Dynamic Arp inspection is disabled            |

|                |                                                                                                                                                                                                                                                                                                                                                        |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Mode</b>    | Global Configuration                                                                                                                                                                                                                                                                                                                                   |
| <b>Usage</b>   | Use the <b>ip arp inspection</b> command to enable Dynamic Arp Inspection function. Use the <b>no</b> form of this command to disable.                                                                                                                                                                                                                 |
| <b>Example</b> | <p>The example shows how to enable Dynamic Arp Inspection on VLAN 1. You can verify settings by the following <b>show ip arp inspection</b> 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

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>ip arp inspection vlan<br/>VLAN-LIST no ip arp<br/>inspection vlan VLAN-LIST</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Parameter</b> | VLAN-LIST                      Specify VLAN ID or a range of VLANs to enable or disable dynamic Arp inspection                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Default</b>   | Default is disabled on all VLANs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Mode</b>      | Global Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Usage</b>     | Use the <b>ip arp inspection vlan</b> command to enable VLANs on Dynamic Arp Inspection function. Use the <b>no</b> form of this command to disable VLANs on Dynamic Arp Inspection function.                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Example</b>   | <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 <b>show ip arp inspection</b> 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

|                     |                                                |
|---------------------|------------------------------------------------|
| <b>&lt;1-50&gt;</b> | 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

|                 |                                     |
|-----------------|-------------------------------------|
| <b>IF_PORTS</b> | specifies ports to clear statistics |
|-----------------|-------------------------------------|

### Default

No default is defined

|                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Mode</b>    | Privileged EXEC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Usage</b>   | Use the <b>clear ip arp inspection interfaces statistics</b> command to clear statistics that are recorded on interface.                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Example</b> | <p>The example shows how to clear statistics on interface gi1. You can verify settings by the following <b>show ip arp inspection interface statistics</b> command.</p> <pre> 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 </pre> |

## show ip arp inspection

|                  |                                                                                                                                                                                            |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>show ip dhcp snooping</b>                                                                                                                                                               |
| <b>Parameter</b> | <b>None</b>                                                                                                                                                                                |
| <b>Default</b>   | No default is defined                                                                                                                                                                      |
| <b>Mode</b>      | Privileged EXEC                                                                                                                                                                            |
| <b>Usage</b>     | Use the <b>show ip arp inspection</b> command to show settings of Dynamic Arp Inspection                                                                                                   |
| <b>Example</b>   | <p>The example shows how to show settings of Dynamic Arp Inspection</p> <pre> switch(config)# show ip arp inspection Dynamic ARP Inspection    : enabled Enable on Vlans          1 </pre> |

## show ip arp inspeciton interface

|                  |                                                                                                                   |
|------------------|-------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>show ip arp inspection interfaces IF_PORTS</b><br><b>show ip arp inspection interfaces IF_PORTS statistics</b> |
| <b>Parameter</b> | <b>IF_PORTS</b> specifies ports to show statistics                                                                |

|                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Default</b> | No default is defined                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Mode</b>    | Privileged EXEC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Usage</b>   | Use the <b>show ip arp inspection interfaces</b> command to show settings or statistics of interface.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Example</b> | <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)

|                  |                                                                                                                                         |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>gvrp</b><br><b>no gvrp</b>                                                                                                           |
| <b>Parameter</b> | None                                                                                                                                    |
| <b>Default</b>   | GVRP is disabled                                                                                                                        |
| <b>Mode</b>      | Global Configuration                                                                                                                    |
| <b>Usage</b>     | Disable gvrp will clear all learned dynamic vlan entry and do not learn dynamic vlan anymore.<br>Use 'show gvrp' to show configuration. |
| <b>Example</b>   | <p>The following example specifies that set global gvrp test.</p> <pre>Switch(config)# gvrp Switch# show gvrp</pre>                     |

GVRP Status

```

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

```

## gvrp (Interface)

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>gvrp</b><br><b>no gvrp</b>                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Parameter</b> | none                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Default</b>   | GVRP is disabled on interface                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Mode</b>      | Interface mode                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Usage</b>     | ‘no gvrp’ will remove dynamic port from vlan.<br>‘gvrp’ must work at port mode is trunk.                                                                                                                                                                                                                                                                                                                                                       |
| <b>Example</b>   | <p>The following example specifies that set port gvrp test.<br/>The port gvrp enable must set port mode is trunk firstly.</p> <pre> Switch(config)#<b>interface gi1</b> Switch(config-if)# <b>switchport mode trunk</b> Switch(config)#<b>gvrp</b> Switch# <b>show gvrp configuration interfaces gi1</b> Port   GVRP-Status   Registration   Dynamic VLAN Creation -----+-----+-----+----- gi1      Enabled      Normal      Disabled   </pre> |

## gvrp registration-mode

|                  |                                                                                                                                                                                                                                                                                     |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>gvrp registration-mode (normal   fixed   forbidden)</b>                                                                                                                                                                                                                          |
| <b>Parameter</b> | <p>(normal   fixed   forbidden)</p> <p>normal: register dynamic vlan, and transmit all vlan attribute.<br/>fixed: do not register dynamic vlan, and only transmit static vlan attribute.<br/>forbidden: do not register dynamic vlan, and only transmit default vlan attribute.</p> |

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

### gvrp vlan-create-forbid

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

### clear gvrp statistics

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

### show gvrp statistics

|                  |                                                                          |                                                                                                                |
|------------------|--------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>show gvrp (statistics   error-statistics) [interfaces IF_PORTS]</b>   |                                                                                                                |
| <b>Parameter</b> | none<br>(statistics  error-statistics)<br>[interfaces IF_PORTS]          | Display all ports<br>statistics – GVRP statistics<br>error-statistics GVRP error<br>statistics Specifies posts |
| <b>Default</b>   | Display all ports statistics info                                        |                                                                                                                |
| <b>Mode</b>      | Privileged EXEC                                                          |                                                                                                                |
| <b>Usage</b>     | 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`



---

|                  |      |
|------------------|------|
| <b>Parameter</b> | none |
|------------------|------|

---

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

### show gvrp configuration

|                          |                                                                                                                                                                                                                                                                                                                            |      |                                 |                          |                                       |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|---------------------------------|--------------------------|---------------------------------------|
| <b>Syntax</b>            | <b>show gvrp configuration [interface IF_PORTS]</b>                                                                                                                                                                                                                                                                        |      |                                 |                          |                                       |
| <b>Parameter</b>         | <table border="1" style="width: 100%;"> <tr> <td style="width: 30%;">none</td> <td>Display all ports configuration</td> </tr> <tr> <td>[interfaces<br/>IF_PORTS]</td> <td>Display Specifies posts configuration</td> </tr> </table>                                                                                        | none | Display all ports configuration | [interfaces<br>IF_PORTS] | Display Specifies posts configuration |
| none                     | Display all ports configuration                                                                                                                                                                                                                                                                                            |      |                                 |                          |                                       |
| [interfaces<br>IF_PORTS] | Display Specifies posts configuration                                                                                                                                                                                                                                                                                      |      |                                 |                          |                                       |
| <b>Default</b>           | Display all ports configuration info                                                                                                                                                                                                                                                                                       |      |                                 |                          |                                       |
| <b>Mode</b>              | Privileged EXEC                                                                                                                                                                                                                                                                                                            |      |                                 |                          |                                       |
| <b>Usage</b>             | This command will display the ports configuration info.                                                                                                                                                                                                                                                                    |      |                                 |                          |                                       |
| <b>Example</b>           | <p>The following example specifies that display gvrp port configuration test.</p> <pre>Switch# <b>show gvrp configuration</b>       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

|                  |                                                                                                                                                                                                         |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>ip igmp snooping no ip igmp snooping</b>                                                                                                                                                             |
| <b>Parameter</b> | None                                                                                                                                                                                                    |
| <b>Default</b>   | Default is enabled                                                                                                                                                                                      |
| <b>Mode</b>      | Global Configuration                                                                                                                                                                                    |
| <b>Usage</b>     | Use the <b>ip igmp snooping</b> command to enable IGMP snooping function.<br>Use the <b>no</b> form of this command to disable.<br>You can verify settings by the <b>show ip igmp snooping</b> command. |
| <b>Example</b>   | The following example specifies that set ip igmp snooping test.<br>Switch(config)# <b>no ip igmp snooping</b>                                                                                           |

### ip igmp snooping report-suppression

|                  |                                                                                   |
|------------------|-----------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>ip igmp snooping report-suppression no ip igmp snooping report-suppression</b> |
| <b>Parameter</b> | None                                                                              |
| <b>Default</b>   | Default is enabled                                                                |
| <b>Mode</b>      | Global Configuration                                                              |

|                |                                                                                                                                                                                                                                                                                                                                      |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Usage</b>   | Use the <b>ip igmp snooping report-suppression</b> command to enable IGMP snooping report-suppression function.<br>Use the <b>no</b> form of this command to disable. Disable report-suppression will forward all received reports to the vlan router ports.<br>You can verify settings by the <b>show ip igmp snooping</b> command. |
| <b>Example</b> | The following example specifies that disable ip igmp snooping report-suppression test.                                                                                                                                                                                                                                               |

## ip igmp snooping version

|                  |                                                                                                                                                                                                                                                                              |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>ip igmp snooping version (2 3)</b>                                                                                                                                                                                                                                        |
| <b>Parameter</b> | (2 3) IGMP version 2 or IGMP version 3 basic mode                                                                                                                                                                                                                            |
| <b>Default</b>   | Default is version 2                                                                                                                                                                                                                                                         |
| <b>Mode</b>      | Global Configuration                                                                                                                                                                                                                                                         |
| <b>Usage</b>     | Use the <b>ip igmp snooping version</b> 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.<br>You can verify settings by the <b>show ip igmp snooping</b> command. |
| <b>Example</b>   | The following example specifies that set ip igmp snooping version 3.<br>Switch(config)# <b>ip igmp snooping version 3</b>                                                                                                                                                    |

## ip igmp snooping unknown-multicast action

|                  |                                                                                                                                     |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>ip igmp snooping unknown-multicast action (drop   flood  router-port)</b><br><b>no ip igmp snooping unknown-multicast action</b> |
| <b>Parameter</b> | (drop   flood   router-port) Drop 、 flood in vlan or forward to router port of unknown multicast packet                             |
| <b>Default</b>   | Default is flood.                                                                                                                   |
| <b>Mode</b>      | 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 | Value | Description                   |
|-----------|-------|-------------------------------|
| 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**

---

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Parameter</b> | VLAN-LIST specifies VLAN ID list to set                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Default</b>   | Default is disabled for all VLANs                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Mode</b>      | Global Configuration                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Usage</b>     | 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.<br>Use the <b>ip igmp snooping vlan</b> command to enable IGMP on VLAN. Use the <b>no</b> form of this command to disable<br>You can verify settings by the <b>show ip igmp snooping vlan</b> command. |
| <b>Example</b>   | 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

|                  |                                                                                                                                                                                                                                                                                   |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>ip igmp snooping vlan &lt;VLAN-LIST&gt; fastleave</b><br><b>no ip igmp snooping vlan &lt;VLAN-LIST&gt; fastleave</b>                                                                                                                                                           |
| <b>Parameter</b> | VLAN-LIST specifies VLAN ID list to set                                                                                                                                                                                                                                           |
| <b>Default</b>   | Default is disabled                                                                                                                                                                                                                                                               |
| <b>Mode</b>      | Global Configuration                                                                                                                                                                                                                                                              |
| <b>Usage</b>     | Use the <b>ip igmp snooping vlan fastleave</b> command to enable fastleave function. Group will remove port immediately when receive leave packet. Use the <b>no</b> form of this command to disable.<br>You can verify settings by the <b>show ip igmp snooping vlan</b> command |
| <b>Example</b>   | The following example specifies that set ip igmp snooping vlan <b>fastleave</b> test.<br>Switch(config)# <b>ip igmp snooping vlan 1 fastleave</b>                                                                                                                                 |

---

## ip igmp snooping vlan last-member-query-count

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

## ip igmp snooping vlan last-member-query-interval

|                  |                                                                                                                                                                                    |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>ip igmp snooping vlan &lt;VLAN-LIST&gt; last-member-query-interval &lt;1-60&gt;</b><br><b>no ip igmp snooping vlan &lt;VLAN-LIST&gt; last-member-query-interval</b>             |
| <b>Parameter</b> | VLAN-LIST specifies VLAN ID list to set<br>last-member-query-interval <1-60> specifies last member query interval to set                                                           |
| <b>Default</b>   | Default is 1                                                                                                                                                                       |
| <b>Mode</b>      | Global Configuration                                                                                                                                                               |
| <b>Usage</b>     | Use the <b>ip igmp snooping vlan last-member-query-interval</b> command to set interval between each query packet.<br>Use the <b>no</b> 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 |



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

## ip igmp snooping vlan robustness-variable

|                  |                                                                                                                                                                                                                                 |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>ip igmp snooping vlan &lt;VLAN-LIST&gt; robustness-variable &lt;1-7&gt;</b><br><b>no ip igmp snooping vlan &lt;VLAN-LIST&gt; robustness-variable</b>                                                                         |
| <b>Parameter</b> | VLAN-LIST specifies VLAN ID list to set<br>robustness-variable specifies a robustness value to set<br><1-7>                                                                                                                     |
| <b>Default</b>   | Default is 2                                                                                                                                                                                                                    |
| <b>Mode</b>      | Global Configuration                                                                                                                                                                                                            |
| <b>Usage</b>     | Use the <b>ip igmp snooping vlan robustness-variable</b> command to times to retry.<br>Use the <b>no</b> form of this command to restore to default<br>You can verify settings by the <b>show ip igmp snooping vlan</b> command |
| <b>Example</b>   | The following example specifies that set ip igmp snooping vlan parameters test.<br>Switch(config)# <b>ip igmp snooping vlan 1 robustness-variable</b>                                                                           |

## ip igmp snooping vlan router

|               |                                                                                                                                   |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b> | <b>ip igmp snooping vlan VLAN-LIST router learn pim-dvmrp</b><br><b>no ip igmp snooping vlan VLAN-LIST router learn pim-dvmrp</b> |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------|

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

## ip igmp snooping vlan forbidden-port

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>ip igmp snooping vlan &lt;VLAN-LIST&gt; forbidden-port IF_PORTS</b><br><b>no ip igmp snooping vlan &lt;VLAN-LIST&gt; forbidden-port IF_PORTS</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Parameter</b> | VLAN-LIST specifies VLAN ID list to set<br>IF_PORTS specifies a port list to set or remove                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Default</b>   | No forbidden ports by default                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Mode</b>      | Global Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Usage</b>     | <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.<br/>‘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.<br/>The configure can use ‘show ip igmp snooping forward-all’.</p> <p>Use the <b>ip igmp snooping vlan forbidden-port</b> command to add static non-forwarding port, all known vlan 1 ipv4 group will remove the forbidden ports.<br/>Use the <b>no</b> form of this command to delete forbidden port.<br/>You can verify settings by the <b>show ip igmp snooping forward-all</b> 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**

---

|                  |           |                                        |
|------------------|-----------|----------------------------------------|
| <b>Parameter</b> | 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**

---

|                  |           |                                        |
|------------------|-----------|----------------------------------------|
| <b>Parameter</b> | 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**

|                  |           |                                        |
|------------------|-----------|----------------------------------------|
| <b>Parameter</b> | 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**

|                  |           |                               |
|------------------|-----------|-------------------------------|
| <b>Parameter</b> | VLAN-LIST | specifies VLAN ID list to set |
|------------------|-----------|-------------------------------|

|                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                        |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|
|                | ip-addr                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | specifies multicast group ipv4 address |
|                | IF_PORTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | specifies port list to set or remove   |
| <b>Default</b> | No static group by default                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                        |
| <b>Mode</b>    | Global Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                        |
| <b>Usage</b>   | <p>Use the <b>ip igmp snooping vlan static-group</b> 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 <b>no</b> 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 <b>show ip igmp snooping group</b> command.</p> |                                        |
| <b>Example</b> | <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

|                  |                                                                                                                                                                                                    |                                        |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|
| <b>Syntax</b>    | <b>no ip igmp snooping vlan &lt;VLAN-LIST&gt; group &lt;ip-addr&gt;</b>                                                                                                                            |                                        |
| <b>Parameter</b> | VLAN-LIST                                                                                                                                                                                          | specifies VLAN ID list to set          |
|                  | ip-addr                                                                                                                                                                                            | specifies multicast group ipv4 address |
| <b>Default</b>   | None                                                                                                                                                                                               |                                        |
| <b>Mode</b>      | Global Configuration                                                                                                                                                                               |                                        |
| <b>Usage</b>     | <p>Use the <b>no ip igmp snooping vlan group</b> command to delete a group which could be static or dynamic.</p> <p>You can verify settings by the <b>show ip igmp snooping group</b> command.</p> |                                        |
| <b>Example</b>   | <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<br>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

|                |                                                                                                                                                                                                         |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Mode</b>    | Global Configuration                                                                                                                                                                                    |
| <b>Usage</b>   | Use the <b>ip igmp profile</b> command to enter profile configuration<br>Use the <b>no</b> form of this command to delete profile<br>You can verify settings by the <b>show ip igmp profile</b> command |
| <b>Example</b> | The following example specifies that set ip igmp profile test.<br>Switch(config)# <b>ip igmp profile 1</b>                                                                                              |

## ip igmp filter

|                  |                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>ip igmp filter &lt;1-128&gt;</b><br><b>[no] ip igmp filter</b>                                                                                                                                                                                                                                                                                                                       |
| <b>Parameter</b> | <1-128> specifies profile ID                                                                                                                                                                                                                                                                                                                                                            |
| <b>Default</b>   | None                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Mode</b>      | Port Configuration                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Usage</b>     | Use the <b>ip igmp filter</b> 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.<br>Use the <b>no</b> form of this command to delete profile<br>You can verify settings by the <b>show ip igmp filter</b> command |
| <b>Example</b>   | The following example specifies that set ip igmp filter test.<br><br>Switch(config)# <b>interface gi1</b><br>Switch(config-if)# <b>ip igmp filter 1</b>                                                                                                                                                                                                                                 |

## ip igmp max-groups

|               |                                                                          |
|---------------|--------------------------------------------------------------------------|
| <b>Syntax</b> | <b>ip igmp max-groups &lt;0-1024&gt;</b><br><b>no ip igmp max-groups</b> |
|---------------|--------------------------------------------------------------------------|

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

### ip igmp max-groups action

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



## clear ip igmp snooping groups

|                    |                                                                                                                                                                                                                                                                                 |      |                                                 |                    |                                         |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------------------------------------------------|--------------------|-----------------------------------------|
| <b>Syntax</b>      | <b>clear ip igmp snooping groups [(dynamic   static)]</b>                                                                                                                                                                                                                       |      |                                                 |                    |                                         |
| <b>Parameter</b>   | <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                                                                                                                                                                                                                                         |      |                                                 |                    |                                         |
| <b>Default</b>     | None                                                                                                                                                                                                                                                                            |      |                                                 |                    |                                         |
| <b>Mode</b>        | Privileged EXEC                                                                                                                                                                                                                                                                 |      |                                                 |                    |                                         |
| <b>Usage</b>       | <p>This command will clear the ip igmp groups for dynamic or static or all of type.<br/>You can verify settings by the <b>show ip igmp snooping groups</b> command.</p>                                                                                                         |      |                                                 |                    |                                         |
| <b>Example</b>     | <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

|                  |                                                                                                                              |
|------------------|------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>clear ip igmp snooping statistics</b>                                                                                     |
| <b>Parameter</b> | none                                                                                                                         |
| <b>Default</b>   | None                                                                                                                         |
| <b>Mode</b>      | Privileged EXEC                                                                                                              |
| <b>Usage</b>     | <p>This command will clear the igmp statistics.<br/>You can verify settings by the <b>show ip igmp snooping</b> 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**                    The following example specifies that display ip igmp snooping group counter test.

```
Switch# show ip igmp snooping group counters
```

---

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

---

## show ip igmp snooping groups

|                    |                                                                                                                                                                                                                                                                                                                                                |      |                                                |                    |                                                 |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------------------------------------------------|--------------------|-------------------------------------------------|
| <b>Syntax</b>      | <b>show ip igmp snooping groups [(dynamic   static)]</b>                                                                                                                                                                                                                                                                                       |      |                                                |                    |                                                 |
| <b>Parameter</b>   | <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                                                                                                                                                                                                                                                                                                |      |                                                |                    |                                                 |
| <b>Default</b>     | None                                                                                                                                                                                                                                                                                                                                           |      |                                                |                    |                                                 |
| <b>Mode</b>        | Privileged EXEC                                                                                                                                                                                                                                                                                                                                |      |                                                |                    |                                                 |
| <b>Usage</b>       | This command will display the ip igmp groups for dynamic or static or all of type.                                                                                                                                                                                                                                                             |      |                                                |                    |                                                 |
| <b>Example</b>     | <p>The following example specifies that show ip igmp snooping groups.</p> <p>Switch# <b>show ip igmp snooping groups</b></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

|                                |                                                                                                                                                                                                                                       |      |                                                              |                                |                                                |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|--------------------------------------------------------------|--------------------------------|------------------------------------------------|
| <b>Syntax</b>                  | <b>show ip igmp snooping router [(dynamic   forbidden  static )]</b>                                                                                                                                                                  |      |                                                              |                                |                                                |
| <b>Parameter</b>               | <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                                                                                                                                                                                        |      |                                                              |                                |                                                |
| <b>Default</b>                 | None                                                                                                                                                                                                                                  |      |                                                              |                                |                                                |

|                |                                                                                                                                                                                                                                                                                                                                                                    |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Mode</b>    | Privileged EXEC                                                                                                                                                                                                                                                                                                                                                    |
| <b>Usage</b>   | This command will display the ip igmp router info.                                                                                                                                                                                                                                                                                                                 |
| <b>Example</b> | <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

|                  |                                                                        |
|------------------|------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>show ip igmp snooping querier</b>                                   |
| <b>Parameter</b> | none                      Show all vlan ip igmp querier info.          |
| <b>Default</b>   | None                                                                   |
| <b>Mode</b>      | Privileged EXEC                                                        |
| <b>Usage</b>     | 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

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |      |                                     |             |                                           |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------------------------------------|-------------|-------------------------------------------|
| <b>Syntax</b>    | <b>show ip igmp snooping vlan [VLAN-LIST]</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |                                     |             |                                           |
| <b>Parameter</b> | <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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |      |                                     |             |                                           |
| <b>Default</b>   | None                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |      |                                     |             |                                           |
| <b>Mode</b>      | Privileged EXEC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |      |                                     |             |                                           |
| <b>Usage</b>     | This command will display ip igmp snooping vlan info.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |                                     |             |                                           |
| <b>Example</b>   | <p>The following example specifies that show ip igmp snooping vlan test.</p> <pre>Switch# <b>show ip igmp snooping vlan 1</b> 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

|                  |                                                                                                                                                                                                          |      |                                                 |                  |                                              |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------------------------------------------------|------------------|----------------------------------------------|
| <b>Syntax</b>    | <b>show ip igmp snooping forward-all [vlan VLAN-LIST]</b>                                                                                                                                                |      |                                                 |                  |                                              |
| <b>Parameter</b> | <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.                                                                                                                                                             |      |                                                 |                  |                                              |
| <b>Default</b>   | None                                                                                                                                                                                                     |      |                                                 |                  |                                              |

|                |                                                                                                                                                                                                                                           |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Mode</b>    | Privileged EXEC                                                                                                                                                                                                                           |
| <b>Usage</b>   | This command will display ip igmp snooping forward all info.                                                                                                                                                                              |
| <b>Example</b> | <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

|                  |                                                                                                                                                                                                                                                                                                                                 |      |                                        |           |                                   |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----------------------------------------|-----------|-----------------------------------|
| <b>Syntax</b>    | <b>show ip igmp profile [&lt;1-128&gt;]</b>                                                                                                                                                                                                                                                                                     |      |                                        |           |                                   |
| <b>Parameter</b> | <table border="1"> <tr> <td>none</td> <td>Show all ip igmp snooping profile info</td> </tr> <tr> <td>[&lt;1-128&gt;]</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                                                                                                                                                                                                                                                                                               |      |                                        |           |                                   |
| <b>Default</b>   | None                                                                                                                                                                                                                                                                                                                            |      |                                        |           |                                   |
| <b>Mode</b>      | Privileged EXEC                                                                                                                                                                                                                                                                                                                 |      |                                        |           |                                   |
| <b>Usage</b>     | This command will display ip igmp profile info.                                                                                                                                                                                                                                                                                 |      |                                        |           |                                   |
| <b>Example</b>   | <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

|                  |                                                                                    |      |                      |
|------------------|------------------------------------------------------------------------------------|------|----------------------|
| <b>Syntax</b>    | <b>show ip igmp filter [interfaces IF_PORTS]</b>                                   |      |                      |
| <b>Parameter</b> | <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** The following example specifies that show ip igmp filter test.  
 Switch# **show ip igmp filter**  
 Port ID | Profile ID  
 -----+-----  
       gi1 : 1  
       gi2 : None  
       gi3 : None  
       gi4 : None  
       gi5 : None  
 --More--

### 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** The following example specifies that show ip igmp max-group test.  
 Switch(config-if)#**ip igmp max-groups 50**  
 Switch# **show ip igmp max-group**



---

```
Port ID | Max Group
```

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

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

```
--More--
```

---

## show ip igmp max-group action

|                       |                                                                                                                                                                                                                                                                                                                                                   |      |                                |                       |                                       |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|--------------------------------|-----------------------|---------------------------------------|
| <b>Syntax</b>         | <code>show ip igmp max-group action [interfaces IF_PORTS]</code>                                                                                                                                                                                                                                                                                  |      |                                |                       |                                       |
| <b>Parameter</b>      | <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                                                                                                                                                                                                                                                                                                             |      |                                |                       |                                       |
| <b>Default</b>        | None                                                                                                                                                                                                                                                                                                                                              |      |                                |                       |                                       |
| <b>Mode</b>           | Privileged EXEC                                                                                                                                                                                                                                                                                                                                   |      |                                |                       |                                       |
| <b>Usage</b>          | This command will display ip igmp port max-group action.                                                                                                                                                                                                                                                                                          |      |                                |                       |                                       |
| <b>Example</b>        | <p>The following example specifies that show ip igmp max-group action test.</p> <pre>Switch(config)#<b>interface gi1</b> Switch(config-if)#<b>ip igmp max-groups action replace</b> Switch# <b>show ip igmp max-group action</b> Port ID   Max-groups Action -----+----- gi1 : replace gi2 : deny gi3 : deny gi4 : deny gi5 : deny --More--</pre> |      |                                |                       |                                       |

## 11. IP Source Guard

### ip source verify

| <b>Syntax</b>    | <b>ip source verify</b><br><b>[mac-and-ip] no ip source</b><br><b>verify</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |           |               |           |               |     |               |          |   |     |          |          |   |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|---------------|-----------|---------------|-----|---------------|----------|---|-----|----------|----------|---|
| <b>Parameter</b> | mac-and-ip                      Verify by mac and ip address boundle                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |           |               |           |               |     |               |          |   |     |          |          |   |
| <b>Default</b>   | IP Source Guard is disabled on interface. Default is that verifying ip address only                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |           |               |           |               |     |               |          |   |     |          |          |   |
| <b>Mode</b>      | Port Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |           |               |           |               |     |               |          |   |     |          |          |   |
| <b>Usage</b>     | Use the <b>ip source verify</b> command to enable IP Source Guard function. Default IP Source Guard filter source IP address. The “ <b>mac-and-ip</b> ” filters not only source IP address but also source MAC address. Use the <b>no</b> form of this command to disable. You can verify settings by the <b>show ip source interfaces</b> command.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |           |               |           |               |     |               |          |   |     |          |          |   |
| <b>Example</b>   | <p>The example shows how to enable IP Source Guard with source IP address filtering on interface gi1.</p> <pre>Switch(config)# <b>interface gi1</b> switch(config-if)# <b>ip source verify</b></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)# <b>interface gi2</b> switch(config-if)# <b>ip source verify mac-and-ip</b> switch(config-if)# <b>do show ip source interfaces gi1-2</b></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>gi1</td> <td>Verify MAC+IP</td> <td>No Limit</td> <td>0</td> </tr> <tr> <td>gi2</td> <td>disabled</td> <td>No Limit</td> <td>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

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                         |             |                                          |               |                                      |         |                                                 |         |                                       |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------------------------------------|---------------|--------------------------------------|---------|-------------------------------------------------|---------|---------------------------------------|
| <b>Syntax</b>    | <b>ip source binding A:B:C:D:E:F vlan &lt;1-4094&gt; A.B.C.D interface IF_PORT</b><br><b>no ip source binding A:B:C:D:E:F vlan &lt;1-4094&gt; A.B.C.D interface IF_PORT</b>                                                                                                                                                                                                                                                             |             |                                          |               |                                      |         |                                                 |         |                                       |
| <b>Parameter</b> | <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 &lt;1-4094&gt;</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.                                                                                                                                                                                                                                                                                                                                                                                                   |             |                                          |               |                                      |         |                                                 |         |                                       |

|                |                                                                                                                                                                                                                                                                                                                                                                                                                               |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Default</b> | Default is no binding entry.                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Mode</b>    | Global Configuration                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Usage</b>   | Use the <b>ip source binding</b> command to create a static IP source binding entry has an IP address, its associated MAC address 、 VLAN ID 、 interface.<br>Use the <b>no</b> form of this command to delete static entry.<br>You can verify settings by the <b>show ip source binding</b> command.                                                                                                                           |
| <b>Example</b> | <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

|                  |                                                                                                                                                                                                                                         |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>show ip source interfaces IF_PORTS</b>                                                                                                                                                                                               |
| <b>Parameter</b> | <b>IF_PORTS</b> specifies ports to show                                                                                                                                                                                                 |
| <b>Default</b>   | No default is defined                                                                                                                                                                                                                   |
| <b>Mode</b>      | Privileged EXEC                                                                                                                                                                                                                         |
| <b>Usage</b>     | Use the <b>show ip source interface</b> command to show settings of IP Source Guard of interface                                                                                                                                        |
| <b>Example</b>   | <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

|                  |                                                                                                                                                                                                                                                                                                                                        |                |                                                |               |                                 |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|------------------------------------------------|---------------|---------------------------------|
| <b>Syntax</b>    | <b>show ip source binding [(dynamic static)]</b>                                                                                                                                                                                                                                                                                       |                |                                                |               |                                 |
| <b>Parameter</b> | <table border="1"> <tr> <td><b>dynamic</b></td> <td>Show entries that added by DHCP snooping learn</td> </tr> <tr> <td><b>static</b></td> <td>Show entries that added by user</td> </tr> </table>                                                                                                                                      | <b>dynamic</b> | Show entries that added by DHCP snooping learn | <b>static</b> | Show entries that added by user |
| <b>dynamic</b>   | Show entries that added by DHCP snooping learn                                                                                                                                                                                                                                                                                         |                |                                                |               |                                 |
| <b>static</b>    | Show entries that added by user                                                                                                                                                                                                                                                                                                        |                |                                                |               |                                 |
| <b>Default</b>   | No default is defined                                                                                                                                                                                                                                                                                                                  |                |                                                |               |                                 |
| <b>Mode</b>      | Privileged EXEC                                                                                                                                                                                                                                                                                                                        |                |                                                |               |                                 |
| <b>Usage</b>     | Use the <b>show ip source binding</b> command to show binding entries of IP Source Guard.                                                                                                                                                                                                                                              |                |                                                |               |                                 |
| <b>Example</b>   | <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

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |                                      |               |                                                                         |               |                                                                                                |                |                                                                                                 |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------------------------------------|---------------|-------------------------------------------------------------------------|---------------|------------------------------------------------------------------------------------------------|----------------|-------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>lag &lt;I-8&gt; mode (static   active   passive)</b><br><b>no lag</b>                                                                                                                                                                                                                                                                                                                                                                                                                                           |       |                                      |               |                                                                         |               |                                                                                                |                |                                                                                                 |
| <b>Parameter</b> | <table border="1"> <tr> <td>&lt;I-8&gt;</td> <td>Specify the LAG id for the interface</td> </tr> <tr> <td><b>static</b></td> <td>Specify the LAG to be static mode and join the interface into this LAG.</td> </tr> <tr> <td><b>active</b></td> <td>Specify the LAG to be dynamic mode and join the interface into this LAG with LACP active port.</td> </tr> <tr> <td><b>passive</b></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 | <b>static</b> | Specify the LAG to be static mode and join the interface into this LAG. | <b>active</b> | Specify the LAG to be dynamic mode and join the interface into this LAG with LACP active port. | <b>passive</b> | 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |                                      |               |                                                                         |               |                                                                                                |                |                                                                                                 |
| <b>static</b>    | Specify the LAG to be static mode and join the interface into this LAG.                                                                                                                                                                                                                                                                                                                                                                                                                                            |       |                                      |               |                                                                         |               |                                                                                                |                |                                                                                                 |
| <b>active</b>    | Specify the LAG to be dynamic mode and join the interface into this LAG with LACP active port.                                                                                                                                                                                                                                                                                                                                                                                                                     |       |                                      |               |                                                                         |               |                                                                                                |                |                                                                                                 |
| <b>passive</b>   | Specify the LAG to be dynamic mode and join the interface into this LAG with LACP passive port.                                                                                                                                                                                                                                                                                                                                                                                                                    |       |                                      |               |                                                                         |               |                                                                                                |                |                                                                                                 |
| <b>Default</b>   | 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**

|                  |                       |                                                                                                                                                                 |
|------------------|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Parameter</b> | <b>src-dst-mac</b>    | Specify algorithm to balance traffic by using source and destination MAC address for all packets.                                                               |
|                  | <b>src-dst-mac-ip</b> | 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

|                |                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Default</b> | Default system priority is 32768.                                                                                                                                                                                                                                                                                                                                                               |
| <b>Mode</b>    | Global Configuration                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Usage</b>   | 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.<br><br>Use “ <b>no lacp system-priority</b> ” to restore to the default priority value. The only way to show this configuration is using “ <b>show running-config</b> ” command. |
| <b>Example</b> | This example shows how to configure lacp system priority to 1000.<br>Switch(config)# <b>lacp system-priority 1000</b>                                                                                                                                                                                                                                                                           |

## lacp timeout

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

## show lacp

|               |                         |
|---------------|-------------------------|
| <b>Syntax</b> | <b>show lacp sys-id</b> |
|---------------|-------------------------|

---

**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.
- **1ndiv**—Port is incapable of bundling with any other port.
- **1ndep**—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**

| Port | LACPDUs |      | LACPDUs |     |
|------|---------|------|---------|-----|
|      | 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     |
|------|--------|---------------|-------------|
|      | 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**                Use “**lldp holdtime-multiplier**” command to configure the LLDP PDU hold multiplier that decides time-to-live (TTL) value sent in LLDP advertisements: TTL = (tx-interval \* holdtime-multiplier). The configuration could be shown by “**show lldp**” command.

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

---

**Example**                This example sets LLDP hold time multiplier to 3.

```
Switch(config)# lldp holdtime-multiplier 3
Switch# show lldp

State: Disabled
Timer: 10 Seconds
Hold multiplier: 3
Reinit delay: 2 Seconds
Tx delay: 2 Seconds
LLDP packet handling: Flooding
```

---

## lldp lldpdu

---

**Syntax**                **lldp lldpdu (filtering|flooding|bridging)**

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|                  |                                                                                                     |
|------------------|-----------------------------------------------------------------------------------------------------|
| <b>bridging</b>  | When LLDP is globally disabled, LLDP packets are bridging (bridging LLDP PDU to VLAN member ports). |
| <b>filtering</b> | When LLDP is globally disabled, LLDP packets are filtered (deleted).                                |
| <b>flooding</b>  | When LLDP is globally disabled, LLDP packets are flooded (forwarded to all interfaces).             |

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**Default**                Default LLDP PDU handling behavior when LLDP disabled is flooding

---

**Mode**                Global Configuration

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**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.

---



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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

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**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

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>lldp med fast-start-repeat-count &lt;1-10&gt;</b><br><b>no lldp med fast-start-repeat-count</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Parameter</b> | <1-10> LLDP PDU fast start TX repeat counts.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Default</b>   | Default fast start TX repeat count is 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Mode</b>      | Global Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Usage</b>     | <p>Use “<b>lldp med fast-start-repeat-count</b>” 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 “<b>show lldp med</b>” command.</p> <p>Use the <b>no</b> form of this command to restore count to default.</p> |
| <b>Example</b>   | <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

|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                     |                                                                                                                             |                      |  |                 |  |             |                                                                                                                                                                                                                                                                 |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-----------------------------------------------------------------------------------------------------------------------------|----------------------|--|-----------------|--|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>        | <b>lldp med location (coordination civic-address ecs-elin) ADDR</b><br><b>no lldp med location (coordination civic-address ecs-elin)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                     |                                                                                                                             |                      |  |                 |  |             |                                                                                                                                                                                                                                                                 |
| <b>Parameter</b>     | <table border="1"> <tr> <td><b>coordination</b></td> <td>Location type to be configured. “ecs-elin” is abbreviation of emergency call service – emergency location identifier number</td> </tr> <tr> <td><b>civic-address</b></td> <td></td> </tr> <tr> <td><b>ecs-elin</b></td> <td></td> </tr> <tr> <td><b>ADDR</b></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> | <b>coordination</b> | Location type to be configured. “ecs-elin” is abbreviation of emergency call service – emergency location identifier number | <b>civic-address</b> |  | <b>ecs-elin</b> |  | <b>ADDR</b> | 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. |
| <b>coordination</b>  | Location type to be configured. “ecs-elin” is abbreviation of emergency call service – emergency location identifier number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                     |                                                                                                                             |                      |  |                 |  |             |                                                                                                                                                                                                                                                                 |
| <b>civic-address</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                     |                                                                                                                             |                      |  |                 |  |             |                                                                                                                                                                                                                                                                 |
| <b>ecs-elin</b>      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                     |                                                                                                                             |                      |  |                 |  |             |                                                                                                                                                                                                                                                                 |
| <b>ADDR</b>          | 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.                                                                                                                                                                                                                                                                                                                                                    |                     |                                                                                                                             |                      |  |                 |  |             |                                                                                                                                                                                                                                                                 |

|                |                                                                                                                                                                                                                                                                                                                                                                                                             |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Default</b> | Deafult is no location data.                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Mode</b>    | Port Configuration                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Usage</b>   | Use “ <b>lldp med location</b> ” 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 “ <b>show lldp interface PORT med</b> ” command.<br><br>Use the <b>no</b> form of this command to clear location data. |

| <b>Example</b> | <p>This example sets location data for interface gil.</p> <pre>Switch(config)# <b>interface gil</b> Switch(config-if)# <b>lldp med location coordinate</b> <b>112233445566778899AABBCCDDEEFF00</b> Switch(config-if)# <b>lldp med location civic-address</b> <b>112233445566</b> Switch(config-if)# <b>lldp med location ecs-elin</b> <b>112233445566778899AA</b> Switch# <b>show lldp interfaces gil med</b></pre> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Port</th> <th style="text-align: left;">Capabilities</th> <th style="text-align: left;">Network Policy</th> <th style="text-align: left;">Location</th> </tr> </thead> <tbody> <tr> <td colspan="4">Inventory</td> </tr> <tr> <td style="text-align: left;">----- +</td> <td style="text-align: left;">----- +</td> <td style="text-align: left;">----- +</td> <td style="text-align: left;">----- +</td> </tr> <tr> <td style="text-align: left;">--</td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: left;">gil  </td> <td style="text-align: left;">Yes  </td> <td style="text-align: left;">Yes  </td> <td style="text-align: left;">Yes  </td> </tr> <tr> <td style="text-align: left;">Yes</td> <td></td> <td></td> <td></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 | Inventory |  |  |  | ----- + | ----- + | ----- + | ----- + | -- |  |  |  | gil | Yes | Yes | Yes | Yes |  |  |  |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|--------------|----------------|----------|-----------|--|--|--|---------|---------|---------|---------|----|--|--|--|-----|-----|-----|-----|-----|--|--|--|
| Port           | Capabilities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Network Policy | Location     |                |          |           |  |  |  |         |         |         |         |    |  |  |  |     |     |     |     |     |  |  |  |
| Inventory      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                |              |                |          |           |  |  |  |         |         |         |         |    |  |  |  |     |     |     |     |     |  |  |  |
| ----- +        | ----- +                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | ----- +        | ----- +      |                |          |           |  |  |  |         |         |         |         |    |  |  |  |     |     |     |     |     |  |  |  |
| --             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                |              |                |          |           |  |  |  |         |         |         |         |    |  |  |  |     |     |     |     |     |  |  |  |
| gil            | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Yes            | Yes          |                |          |           |  |  |  |         |         |         |         |    |  |  |  |     |     |     |     |     |  |  |  |
| Yes            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                |              |                |          |           |  |  |  |         |         |         |         |    |  |  |  |     |     |     |     |     |  |  |  |

## lldp med network-policy

|                        |                                                                                                                                                                                                                                                                                                                                                                        |                     |                                  |              |                                              |                        |                    |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|----------------------------------|--------------|----------------------------------------------|------------------------|--------------------|
| <b>Syntax</b>          | <p><b>lldp med network-policy</b> &lt;1-32&gt; <b>app</b> (voice voice-signaling guest-voice guest-voice-signaling softphone-voice video-conferencing streaming-video video-signaling) <b>vlan</b> &lt;1-4094&gt; <b>vlan-type</b> (tag untag) <b>priority</b> &lt;0-7&gt; <b>dscp</b> &lt;0-63&gt;</p> <p><b>no lldp med network-policy</b> &lt;1-32&gt;</p>          |                     |                                  |              |                                              |                        |                    |
| <b>Parameter</b>       | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;"><b>&lt;1-32&gt;</b></td> <td>Specify the network policy index</td> </tr> <tr> <td><b>voice</b></td> <td rowspan="3">Specify the network policy application type.</td> </tr> <tr> <td><b>voice-signaling</b></td> </tr> <tr> <td><b>guest-voice</b></td> </tr> </table> | <b>&lt;1-32&gt;</b> | Specify the network policy index | <b>voice</b> | Specify the network policy application type. | <b>voice-signaling</b> | <b>guest-voice</b> |
| <b>&lt;1-32&gt;</b>    | Specify the network policy index                                                                                                                                                                                                                                                                                                                                       |                     |                                  |              |                                              |                        |                    |
| <b>voice</b>           | Specify the network policy application type.                                                                                                                                                                                                                                                                                                                           |                     |                                  |              |                                              |                        |                    |
| <b>voice-signaling</b> |                                                                                                                                                                                                                                                                                                                                                                        |                     |                                  |              |                                              |                        |                    |
| <b>guest-voice</b>     |                                                                                                                                                                                                                                                                                                                                                                        |                     |                                  |              |                                              |                        |                    |

|                |                                                                                                                                         |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------|
|                | <b>guest-voice-signaling</b><br><b>softphone-voice</b><br><b>video-conferencing</b><br><b>streaming-video</b><br><b>video-signaling</b> |
|                | <b>&lt;1-4094&gt;</b> Specify the VLAN ID                                                                                               |
|                | <b>tag</b> Specify the VLAN tag status<br><b>untag</b>                                                                                  |
|                | <b>&lt;0-7&gt;</b> Specify the L2 priority                                                                                              |
|                | <b>&lt;0-63&gt;</b> Specify the DSCP value                                                                                              |
| <b>Default</b> | 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)

|                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |            |                                       |               |                                          |                     |                                  |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---------------------------------------|---------------|------------------------------------------|---------------------|----------------------------------|
| <b>Syntax</b>       | <b>lldp med network-policy (add remove) &lt;1-32&gt;</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |                                       |               |                                          |                     |                                  |
| <b>Parameter</b>    | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="border: none;"><b>add</b></td> <td style="border: none;">Add network policy binding for ports.</td> </tr> <tr> <td style="border: none;"><b>remove</b></td> <td style="border: none;">Remove network policy binding for ports.</td> </tr> <tr> <td style="border: none;"><b>&lt;1-32&gt;</b></td> <td style="border: none;">Specify the network policy index</td> </tr> </table>                                                                                                                                                                                                                                                                                                              | <b>add</b> | Add network policy binding for ports. | <b>remove</b> | Remove network policy binding for ports. | <b>&lt;1-32&gt;</b> | Specify the network policy index |
| <b>add</b>          | Add network policy binding for ports.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |            |                                       |               |                                          |                     |                                  |
| <b>remove</b>       | Remove network policy binding for ports.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |                                       |               |                                          |                     |                                  |
| <b>&lt;1-32&gt;</b> | Specify the network policy index                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |            |                                       |               |                                          |                     |                                  |
| <b>Default</b>      | Default is no network policy binding to port.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                                       |               |                                          |                     |                                  |
| <b>Mode</b>         | Port Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                                       |               |                                          |                     |                                  |
| <b>Usage</b>        | Use “ <b>lldp med network-policy</b> ” 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 “ <b>show lldp med</b> ” command.                                                                                                                                                                                                                                                                                                                                                                                                 |            |                                       |               |                                          |                     |                                  |
| <b>Example</b>      | <p>This example binds network policy for interface gi1 and gi2.</p> <pre>Switch# <b>show lldp med</b>  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)# <b>interface range gi1,2</b> Switch(config-if-range)# <b>lldp med network-policy add 1,32</b> Switch# <b>show lldp interfaces gi1,2 med</b>    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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                |              |                |          |           |     |     |     |     |     |     |     |    |    |    |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|--------------|----------------|----------|-----------|-----|-----|-----|-----|-----|-----|-----|----|----|----|
| <b>Default</b> | network-policy TLV                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                |              |                |          |           |     |     |     |     |     |     |     |    |    |    |
| <b>Mode</b>    | Port Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                |              |                |          |           |     |     |     |     |     |     |     |    |    |    |
| <b>Usage</b>   | <p>Use “<b>lldp med tlv-select</b>” 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.</p> <p>Use the <b>no</b> form of this command to remove all selected MED TLV over the dedicated ports.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                |              |                |          |           |     |     |     |     |     |     |     |    |    |    |
| <b>Example</b> | <p>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.</p> <pre>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</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;">Capabilities</th> <th style="text-align: left;">Network Policy</th> <th style="text-align: left;">Location</th> <th style="text-align: left;">Inventory</th> </tr> </thead> <tbody> <tr> <td>gi1</td> <td>Yes</td> <td>Yes</td> <td>Yes</td> <td>Yes</td> </tr> <tr> <td>gi2</td> <td>Yes</td> <td>No</td> <td>No</td> <td>No</td> </tr> </tbody> </table> | Port           | Capabilities | Network Policy | Location | Inventory | gi1 | Yes | Yes | Yes | Yes | gi2 | Yes | No | No | No |
| Port           | Capabilities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Network Policy | Location     | Inventory      |          |           |     |     |     |     |     |     |     |    |    |    |
| gi1            | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Yes            | Yes          | Yes            |          |           |     |     |     |     |     |     |     |    |    |    |
| gi2            | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | No             | No           | No             |          |           |     |     |     |     |     |     |     |    |    |    |

## lldp tlv-select

|                  |                                                                                                                                                                         |                                                                                                                                                                                                                                                                                              |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>lldp tlv-select</b> <i>TLV</i> [ <i>TLV</i> ] [ <i>TLV</i> ] [ <i>TLV</i> ] [ <i>TLV</i> ] [ <i>TLV</i> ] [ <i>TLV</i> ] [ <i>TLV</i> ]<br><b>no lldp tlv-select</b> |                                                                                                                                                                                                                                                                                              |
| <b>Parameter</b> | 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). |

|                |                                                                                                                                                                                                 |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Default</b> | Default is no selected optional TLV.                                                                                                                                                            |
| <b>Mode</b>    | Port Configuration                                                                                                                                                                              |
| <b>Usage</b>   | Use “lldp tlv-select” command to attach selected TLV in PDU. The configuration could be shown by “show lldp” command.<br><br>Use the <b>no</b> form of this command to remove all selected TLV. |

**Example** This example selects system name, system description, system capability, 802.3 MAC-PHY, 802.3 link aggregation, 802.3 max frame size, and management address TLVs for interface gi1 and gi3.

```
Switch(config)# interface range gi 1,3
Switch(config-if-range)# lldp tlv-select port-desc sys-name
sys-desc sys-cap mac-phy lag max-frame-size management-addr
Switch(config-if-range)# end
Switch# show lldp interfaces gi1,3
```

```
State: Disabled
Timer: 10 Seconds
Hold multiplier: 3
Reinit delay: 2 Seconds
Tx delay: 2 Seconds
LLDP packet handling: Flooding
```

| Port                          | State | Optional TLVs  | Address       |
|-------------------------------|-------|----------------|---------------|
| ----- + ----- + ----- + ----- |       |                | gi1           |
|                               | RX,TX | PD, SN, SD, SC | 192.168.1.254 |
| gi3                           | RX,TX | PD, SN, SD, SC | 192.168.1.254 |

```
Port ID: gi1
802.3 optional TLVs: 802.3-mac-phy, 802.3-lag, 802.3-max-
frame-size, management-addr
802.1 optional TLVs
PVID: Enabled
```

```
Port ID: gi3
802.3 optional TLVs: 802.3-mac-phy, 802.3-lag, 802.3-max-
frame-size, management-addr
802.1 optional TLVs
PVID: Enabled
```

## lldp tlv-select pvid

|                  |                                                                                                                  |
|------------------|------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>lldp tlv-select pvid (disable enable)</b><br><b>no lldp tlv-select pvid</b>                                   |
| <b>Parameter</b> | <b>disable</b> Disable LLDP 802.1 PVID TLV attach state<br><b>enable</b> Enable LLDP 802.1 PVID TLV attach state |



---

|                  |                             |                                                                                                                                                                       |
|------------------|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Parameter</b> | <b>add <i>VLAN-LIST</i></b> | 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 |               | gi1<br> 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 IF_NMLPORTS 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
```

|                  |                    |                                          |
|------------------|--------------------|------------------------------------------|
| <b>Parameter</b> | <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 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

```

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Parameter</b> | <i>IF_NMLPORTS</i> Specify the ports to display information                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Default</b>   | There is no default configuration for this command                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Mode</b>      | Privileged EXEC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Usage</b>     | Use “ <b>show lldp neighbor</b> ” 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Example</b>   | <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

|                  |                                                                                          |
|------------------|------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>show lldp statistics</b><br><b>show lldp interfaces <i>IF_NMLPORTS</i> statistics</b> |
| <b>Parameter</b> | <i>IF_NMLPORTS</i> Specify the ports to display information                              |
| <b>Default</b>   | There is no default configuration for this command                                       |
| <b>Mode</b>      | Privileged EXEC                                                                          |
| <b>Usage</b>     | Use “ <b>show lldp statistics</b> ” 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 _____
```



# Command Line Interface User Guide

| 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<br>Total | TX Frames<br>Unrecognized | RX Frames<br>Total | RX Frames<br>Discarded | RX Errors | RX TLVs<br>Discarded | RX Age |
|------|--------------------|---------------------------|--------------------|------------------------|-----------|----------------------|--------|
| gil  | 51                 | 0                         | 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 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| System| notice|
System Startup!
 4|Jan 01 2000 08:01:13| System| 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

|                  |                                                                                                                                                                                                         |                 |                                           |             |                                             |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-------------------------------------------|-------------|---------------------------------------------|
| <b>Syntax</b>    | <b>clear logging (buffered file)</b>                                                                                                                                                                    |                 |                                           |             |                                             |
| <b>Parameter</b> | <table border="1"> <tr> <td><b>buffered</b></td> <td>Clear the log messages stored in the RAM.</td> </tr> <tr> <td><b>file</b></td> <td>Clear the log messages stored in the Flash.</td> </tr> </table> | <b>buffered</b> | Clear the log messages stored in the RAM. | <b>file</b> | Clear the log messages stored in the Flash. |
| <b>buffered</b>  | Clear the log messages stored in the RAM.                                                                                                                                                               |                 |                                           |             |                                             |
| <b>file</b>      | Clear the log messages stored in the Flash.                                                                                                                                                             |                 |                                           |             |                                             |
| <b>Default</b>   | N/A                                                                                                                                                                                                     |                 |                                           |             |                                             |
| <b>Mode</b>      | Privileged EXEC                                                                                                                                                                                         |                 |                                           |             |                                             |
| <b>Usage</b>     | To clear the log messages from the internal logging buffer and flash, use the command <b>clear logging</b> in the Privileged EXEC mode.                                                                 |                 |                                           |             |                                             |
| <b>Example</b>   | <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

|                  |                                                                                                                                                                                                                                                                                                      |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>logging</b><br><b>no logging</b>                                                                                                                                                                                                                                                                  |
| <b>Parameter</b> | N/A                                                                                                                                                                                                                                                                                                  |
| <b>Default</b>   | Logging service is enabled.                                                                                                                                                                                                                                                                          |
| <b>Mode</b>      | Global Configuration                                                                                                                                                                                                                                                                                 |
| <b>Usage</b>     | <p>To enable logging service on the switch, use the command <b>logging</b> in the Global Configuration mode. Otherwise, use the <b>no</b> 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 <b>show</b></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.                                                                                                                                                                                                                                                              |
| <b>facility</b> <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.                                                                                                     |
| <b>port</b> <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.                                                                                                                                                                             |
| <b>severity</b> <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

|                     |                                                                                                                                                                                                                                                                                                                                   |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>buffered</b>     | Log messages to RAM.                                                                                                                                                                                                                                                                                                              |
| <b>console</b>      | Log messages to console buffer.                                                                                                                                                                                                                                                                                                   |
| <b>file</b>         | Log messages to Flash.                                                                                                                                                                                                                                                                                                            |
| <b>severity sev</b> | 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 <b>logging severity</b> 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

|                 |                                               |
|-----------------|-----------------------------------------------|
| <b>buffered</b> | Display the log messages stored in the RAM.   |
| <b>file</b>     | 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

|                  |                                                                                                                                                                                                  |                                                                 |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|
| <b>Syntax</b>    | <b>clear mac address-table dynamic [interfaces <i>IF_PORTS</i> vlan <i>vlan-id</i>]</b>                                                                                                          |                                                                 |
| <b>Parameter</b> | <b>interfaces</b><br><i>IF_PORTS</i>                                                                                                                                                             | Delete all dynamic addresses learned on the specific interface. |
|                  | <b>vlan <i>vlan-id</i></b>                                                                                                                                                                       | Delete all source addresses learned on the specific VLAN.       |
| <b>Default</b>   | N/A                                                                                                                                                                                              |                                                                 |
| <b>Mode</b>      | Privileged EXEC                                                                                                                                                                                  |                                                                 |
| <b>Usage</b>     | To clear the dynamic (learned) MAC entries from the MAC address table, the specific interface, or the specific VLAN, use the command <b>clear mac address-table</b> in the Privileged EXEC mode. |                                                                 |
| <b>Example</b>   | The following example clears the learned MAC addresses on the interface gi1.<br><br>Switch# clear mac address-table dynamic interfaces gi1                                                       |                                                                 |

### mac address-table aging-time

|                  |                                                   |                                                                                                                                                      |
|------------------|---------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>mac access-table aging-time <i>seconds</i></b> |                                                                                                                                                      |
| <b>Parameter</b> | <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. |
| <b>Default</b>   | The default aging time is 300 seconds.            |                                                                                                                                                      |

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

## mac address-table static

|                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                       |                 |              |                            |                                        |                                     |                                                      |             |                                                                                |
|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|--------------|----------------------------|----------------------------------------|-------------------------------------|------------------------------------------------------|-------------|--------------------------------------------------------------------------------|
| <b>Syntax</b>                       | <b>mac address-table static</b> <i>mac-addr</i> <b>vlan</b> <i>vlan-id</i> <b>interfaces</b> <i>IF_PORTS</i><br><b>mac address-table static</b> <i>mac-addr</i> <b>vlan</b> <i>vlan-id</i> <b>drop</b><br><b>no mac address-table static</b> <i>mac-addr</i> <b>vlan</b> <i>vlan-id</i>                                                                                                                                               |                 |              |                            |                                        |                                     |                                                      |             |                                                                                |
| <b>Parameter</b>                    | <table border="1"> <tr> <td><i>mac-addr</i></td> <td>MAC address.</td> </tr> <tr> <td><b>vlan</b> <i>vlan-id</i></td> <td>Specify the VLAN ID for the interface.</td> </tr> <tr> <td><b>Interface</b><br/><i>IF_PORTS</i></td> <td>Specify the interface ID or a list of interface IDs.</td> </tr> <tr> <td><b>drop</b></td> <td>Drop the packets with the specified source or destination unicast MAC address.</td> </tr> </table>   | <i>mac-addr</i> | MAC address. | <b>vlan</b> <i>vlan-id</i> | Specify the VLAN ID for the interface. | <b>Interface</b><br><i>IF_PORTS</i> | Specify the interface ID or a list of interface IDs. | <b>drop</b> | Drop the packets with the specified source or destination unicast MAC address. |
| <i>mac-addr</i>                     | MAC address.                                                                                                                                                                                                                                                                                                                                                                                                                          |                 |              |                            |                                        |                                     |                                                      |             |                                                                                |
| <b>vlan</b> <i>vlan-id</i>          | Specify the VLAN ID for the interface.                                                                                                                                                                                                                                                                                                                                                                                                |                 |              |                            |                                        |                                     |                                                      |             |                                                                                |
| <b>Interface</b><br><i>IF_PORTS</i> | Specify the interface ID or a list of interface IDs.                                                                                                                                                                                                                                                                                                                                                                                  |                 |              |                            |                                        |                                     |                                                      |             |                                                                                |
| <b>drop</b>                         | Drop the packets with the specified source or destination unicast MAC address.                                                                                                                                                                                                                                                                                                                                                        |                 |              |                            |                                        |                                     |                                                      |             |                                                                                |
| <b>Default</b>                      | No static addresses are configured                                                                                                                                                                                                                                                                                                                                                                                                    |                 |              |                            |                                        |                                     |                                                      |             |                                                                                |
| <b>Mode</b>                         | Global Configuration                                                                                                                                                                                                                                                                                                                                                                                                                  |                 |              |                            |                                        |                                     |                                                      |             |                                                                                |
| <b>Usage</b>                        | To add a static address to the MAC address table, use the command <b>mac address-table static</b> in the Global Configuration mode. For the unicast MAC address filtering, use the command <b>mac address-table static</b> with parameter <b>drop</b> 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 <b>no</b> form of the command. |                 |              |                            |                                        |                                     |                                                      |             |                                                                                |
| <b>Example</b>                      | The following example adds a static address into MAC address table.<br><br><pre>Switch# mac address-table static 00:11:22:33:44:55 vlan 1 interfaces fa5</pre><br>The following example adds a rule of unicast address filtering into MAC address table.<br><br><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                 | Description                                                 |
|---------------------------|-------------------------------------------------------------|
| <b>dynamic</b>            | Display only dynamic MAC addresses                          |
| <b>static</b>             | Display only static MAC addresses                           |
| <b>Interface IF_PORTS</b> | Display the MAC addresses entries for a specific interface. |
| <b>vlan vlan-id</b>       | Display the MAC address entries for a specific VLAN.        |
| <b>mac-addr</b>           | 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

---

|               |                                        |
|---------------|----------------------------------------|
| <b>Syntax</b> | <b>show mac address-table counters</b> |
|---------------|----------------------------------------|

---

|                  |     |
|------------------|-----|
| <b>Parameter</b> | N/A |
|------------------|-----|

---

|                |     |
|----------------|-----|
| <b>Default</b> | N/A |
|----------------|-----|

---

|             |                 |
|-------------|-----------------|
| <b>Mode</b> | Privileged EXEC |
|-------------|-----------------|

---

|              |                                                                                                                                            |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Usage</b> | To display the total entries in the MAC address table, use the command <b>show mac address-table counters</b> in the Privileged EXEC mode. |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------|

---

|                |                                                                           |
|----------------|---------------------------------------------------------------------------|
| <b>Example</b> | 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

---

|               |                                          |
|---------------|------------------------------------------|
| <b>Syntax</b> | <b>show mac address-table aging-time</b> |
|---------------|------------------------------------------|

---

|                  |     |
|------------------|-----|
| <b>Parameter</b> | N/A |
|------------------|-----|

---

|                |     |
|----------------|-----|
| <b>Default</b> | N/A |
|----------------|-----|

---

|             |                 |
|-------------|-----------------|
| <b>Mode</b> | Privileged EXEC |
|-------------|-----------------|

---

|              |                                                                                                                       |
|--------------|-----------------------------------------------------------------------------------------------------------------------|
| <b>Usage</b> | To show MAC address aging time, use the command <b>show mac address-table aging-time</b> 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>

|                      |                    |                                         |
|----------------------|--------------------|-----------------------------------------|
| <b>&lt;Parameter</b> | <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>]

|                      |                |                                                                                         |
|----------------------|----------------|-----------------------------------------------------------------------------------------|
| <b>&lt;Parameter</b> | <1-2147483647> | Specify the group ID.<br>(optional in no form) Delete all mapping group if not specify. |
|                      | <1-4094>       | Specify the VLAN ID to give to match packet.                                            |

---

|                |                                                                                                                                                                                           |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Default</b> | No mappings are configured.                                                                                                                                                               |
| <b>Mode</b>    | Interface Configuration                                                                                                                                                                   |
| <b>Usage</b>   | Use the “ <b>vlan mac-vlan group</b> ” to create mapping of group and VLAN ID of an interface.<br><br>Use the <b>no</b> form of this command to delete mapping.                           |
| <b>Example</b> | The following example shows how to mapping group id 333 to VLAN 100 on interface fa1.<br><br>Switch(config)# Interface fa1<br>Switch(config-if) # <b>vlan mac-vlan group 333 VLAN 100</b> |

---

## show vlan mac-vlan groups

---

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

---

## show vlan mac-vlan interfaces

|                  |                                                                                                                                                                                                                         |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>show vlan mac-vlan [interfaces IF_PORTS]</b>                                                                                                                                                                         |
| <b>Parameter</b> | IF_PORTS (Optional) Specify interfaces mac vlan to display.<br>Display all ports if not specify.                                                                                                                        |
| <b>Default</b>   | N/A                                                                                                                                                                                                                     |
| <b>Mode</b>      | Privileged EXEC                                                                                                                                                                                                         |
| <b>Usage</b>     | Use the <b>show vlan mac-vlan interface</b> command in EXEC mode to display the mac-vlan interfaces setting                                                                                                             |
| <b>Example</b>   | <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

|                  |                                                                             |
|------------------|-----------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>management access-list NAME</b><br><b>no management access-list NAME</b> |
| <b>Parameter</b> | NAME The name of management ACL                                             |
| <b>Default</b>   | No management ACL is configured.                                            |
| <b>Mode</b>      | 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**

|                  |      |                                        |
|------------------|------|----------------------------------------|
| <b>Parameter</b> | 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)**

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

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

|                |                                                                                                                                                                                                                                                                                               |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Default</b> | No rules are configured.                                                                                                                                                                                                                                                                      |
| <b>Mode</b>    | Management Access-List Configuration                                                                                                                                                                                                                                                          |
| <b>Usage</b>   | Use the permit command to add permit rules that bypass those packets hit the rule.                                                                                                                                                                                                            |
| <b>Example</b> | <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

|                  |                                                                                                                                                                                                                        |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>no sequence</b> <1-65535>                                                                                                                                                                                           |
| <b>Parameter</b> | <1-65535> Specify sequence index of ACL entry to delete.                                                                                                                                                               |
| <b>Default</b>   | No rules are configured.                                                                                                                                                                                               |
| <b>Mode</b>      | Management Access-List Configuration                                                                                                                                                                                   |
| <b>Usage</b>     | Use the <b>no sequence</b> command to delete an entry in management ACL.                                                                                                                                               |
| <b>Example</b>   | <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

|                  |                                     |
|------------------|-------------------------------------|
| <b>Syntax</b>    | <b>show management access-class</b> |
| <b>Parameter</b> |                                     |

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

## show management access-list

|                  |                                                                                                                                                                                                                                                                                    |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>show management access-list [NAME]</b>                                                                                                                                                                                                                                          |
| <b>Parameter</b> | NAME Specify the name of management ACL to displayed                                                                                                                                                                                                                               |
| <b>Default</b>   | No default is defined                                                                                                                                                                                                                                                              |
| <b>Mode</b>      | Privileged EXEC                                                                                                                                                                                                                                                                    |
| <b>Usage</b>     | Use the <b>show management access-list</b> command to show management ACL.                                                                                                                                                                                                         |
| <b>Example</b>   | <p>The example shows how to show management access-list</p> <pre>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)</pre> |

## 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)
```

|                          |                                                                                                                                                                                                                                                                                                                                                                                     |                                                                     |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|
| <b>&lt;Parameter&gt;</b> | <i>&lt;1-4&gt;</i>                                                                                                                                                                                                                                                                                                                                                                  | Specify the mirror session to configure                             |
|                          | <i>IF_NMLPORT</i>                                                                                                                                                                                                                                                                                                                                                                   | Specify the SPAN destination. A destination must be a physical port |
|                          | <b>allow-ingress</b>                                                                                                                                                                                                                                                                                                                                                                | Enable ingress traffic forwarding.                                  |
| <b>Default</b>           | No monitor sessions are configured.                                                                                                                                                                                                                                                                                                                                                 |                                                                     |
| <b>Mode</b>              | Global Configuration                                                                                                                                                                                                                                                                                                                                                                |                                                                     |
| <b>Usage</b>             | <p>Use the “<b>mirror session destination interface</b>” command to start a destination interface of a port mirror session.</p> <p>Use the <b>no</b> form of this command to stop a destination interface of a port mirroring session.</p> <p>Use the “<b>no mirror session</b>” command to disable all mirror sessions or specific mirror session.</p>                             |                                                                     |
| <b>Example</b>           | <p>The following example shows how to create a local session 1 to monitor both sent and received traffic on source port fa1.</p> <pre>Switch(config)# <b>mirror session 1 destination interface fa1</b> Switch# <b>show mirror session 1</b> Session 1 Configuration Source RX Port          : fa2-5 Source TX Port   : fa2-5 Destination port  : fa1 Ingress State: disabled</pre> |                                                                     |

## mirror session source interface

|                          |                                                                                                                                                                                                                   |                                                                                          |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| <b>Syntax</b>            | <b>mirror session &lt;1-4&gt; source interfaces IF_PORTS (both   rx   tx)</b><br><b>no mirror session &lt;1-4&gt; source interfaces IF_PORTS (both   rx   tx)</b><br><b>no mirror session (&lt;1-4&gt;   all)</b> |                                                                                          |
| <b>&lt;Parameter&gt;</b> | <i>&lt;1-4&gt;</i>                                                                                                                                                                                                | Specify the mirror session to configure                                                  |
|                          | <i>IF_PORTS</i>                                                                                                                                                                                                   | Specify the source interface, Valid interfaces include physical ports and port channels. |
|                          | <b>both</b>                                                                                                                                                                                                       | Mirror tx and rx direction                                                               |
|                          | <b>rx</b>                                                                                                                                                                                                         | Mirror rx direction only                                                                 |
|                          | <b>tx</b>                                                                                                                                                                                                         | Mirror tx direction only                                                                 |
| <b>Default</b>           | No monitor sessions are configured.                                                                                                                                                                               |                                                                                          |

|              |                                                                                                                                                                                                                                                                                              |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Mode</b>  | Global Configuration                                                                                                                                                                                                                                                                         |
| <b>Usage</b> | <p>Use the “<b>mirror session source interface</b>” command to start a port mirror session.</p> <p>Use the <b>no</b> form of this command to stop a port mirroring session.</p> <p>Use the “<b>no mirror session</b>” command to disable all mirror sessions or specific mirror session.</p> |

|                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Example</b> | <p>The following example shows how to create a local SPAN session 1 to monitor both sent and received traffic on source port fa1.</p> <pre>Switch(config)# <b>mirror session 1 source interface fa2-5 both</b> Switch(config)# <b>mirror session 1 destination interface fa1</b> Switch(config)# <b>show mirror session 1</b> Session 1 Configuration Source RX Port      : fa2-5 Source TX Port      : fa2-5 Destination port    : fa1 Ingress State: disabled</pre> |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## show mirror

|                  |                                                                                                                                                                                                                                         |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>show mirror [session &lt;1-4&gt;]</b>                                                                                                                                                                                                |
| <b>Parameter</b> | <1-4> Specify the mirror session to display                                                                                                                                                                                             |
| <b>Default</b>   | N/A                                                                                                                                                                                                                                     |
| <b>Mode</b>      | Privileged EXEC                                                                                                                                                                                                                         |
| <b>Usage</b>     | Use the <b>show mirror</b> command to display mirror session configuration                                                                                                                                                              |
| <b>Example</b>   | <p>This following example shows how to display mirror session configuration</p> <pre>Switch(config)# <b>show mirror</b> Session 1 Configuration Source RX Port      : fa2-5 Source TX Port      : fa2-5 Destination port    : fa1</pre> |

---

```
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

|                  |                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>ipv6 mld snooping no ipv6 mld snooping</b>                                                                                                                                                                                                                                                                                                                                                           |
| <b>Parameter</b> | None                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Default</b>   | Default is disabled                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Mode</b>      | Global Configuration                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Usage</b>     | Use the <b>ipv6 mld snooping</b> command to enable MLD snooping function. Use the <b>no</b> 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.<br>You can verify settings by the <b>show ipv6 mld snooping</b> command. |
| <b>Example</b>   | The following example specifies that set <b>ipv6 mld snooping</b> test.<br>Switch(config)# <b>ipv6 mld snooping</b>                                                                                                                                                                                                                                                                                     |

### ipv6 mld snooping report-suppression

---

**Syntax**

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



|                  |                                                                                                                                                                                                                                                                                                                                       |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Parameter</b> | none                                                                                                                                                                                                                                                                                                                                  |
| <b>Default</b>   | Default is enabled                                                                                                                                                                                                                                                                                                                    |
| <b>Mode</b>      | Global Configuration                                                                                                                                                                                                                                                                                                                  |
| <b>Usage</b>     | Use the <b>ipv6 mld snooping report-suppression</b> command to enable MLD snooping report-suppression function.<br>Use the <b>no</b> form of this command to disable. Disable report-suppression will forward all received reports to the vlan router ports.<br>You can verify settings by the <b>show ipv6 mld snooping</b> command. |
| <b>Example</b>   | The following example specifies that disable ipv6 mld snooping report-suppression test.<br>Switch(config)# <b>no ipv6 mld snooping report-suppression</b>                                                                                                                                                                             |

## ipv6 mld snooping version

|                  |                                                                                                                                                                                                                  |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>ipv6 mld snooping version (1 2)</b>                                                                                                                                                                           |
| <b>Parameter</b> | (1 2)                      Ipv6 mld snooping running version 1 or 2                                                                                                                                              |
| <b>Default</b>   | Default is version 1                                                                                                                                                                                             |
| <b>Mode</b>      | Global Configuration                                                                                                                                                                                             |
| <b>Usage</b>     | Use the <b>ipv6 mld snooping version</b> command to change MLD support version. Version 2 packet won't be processed if choose version 1.<br>You can verify settings by the <b>show ip igmp snooping</b> command. |
| <b>Example</b>   | The following example specifies that set ipv6 mld snooping version 2.<br>Switch(config)# <b>ipv6 mld snooping version 2</b>                                                                                      |

## ipv6 mld snooping unknown-multicast action

|               |                                                                                                                                       |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b> | <b>ipv6 mld snooping unknown-multicast action (drop   flood  router-port)</b><br><b>no ipv6 mld snooping unknown-multicast action</b> |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------|

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                            |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| <b>Parameter</b> | (drop   flood   router-port)                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Drop 、 flood in vlan or forward to router port of unknown multicast packet |
| <b>Default</b>   | Default is flood.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                            |
| <b>Mode</b>      | Global Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                            |
| <b>Usage</b>     | <p>When igmp and mld snooping disabled, it can't set action router-port. When disable igmp snooping &amp; 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 <b>ipv6 mld snooping unknown-multicast action</b> command to change action.<br/>Use the <b>no</b> form of this command to restore to default.<br/>You can verify settings by the <b>show ipv6 mld snooping</b> command.</p> |                                                                            |
| <b>Example</b>   | <p>The following example specifies that set ipv6 mld unknown multicast action router-port test.</p> <pre>Switch(config)# <b>ipv6 mld snooping unknown-multicast action router-port</b></pre>                                                                                                                                                                                                                                                                                                             |                                                                            |

## ipv6 mld snooping vlan

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                    |                               |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| <b>Syntax</b>    | <b>ipv6 mld snooping vlan VLAN-LIST</b><br><b>no ipv6 mld snooping vlan VLAN-LIST</b>                                                                                                                                                                                                                                                                                                                                              |                               |
| <b>Parameter</b> | VLAN-LIST                                                                                                                                                                                                                                                                                                                                                                                                                          | specifies VLAN ID list to set |
| <b>Default</b>   | Default is disabled for all VLANs                                                                                                                                                                                                                                                                                                                                                                                                  |                               |
| <b>Mode</b>      | Global Configuration                                                                                                                                                                                                                                                                                                                                                                                                               |                               |
| <b>Usage</b>     | <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.<br/>Use the <b>ipv6 mld snooping vlan</b> command to enable MLD on VLAN.<br/>Use the <b>no</b> form of this command to disable<br/>You can verify settings by the <b>show ipv6 mld snooping vlan</b> 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

```

|                  |                                   |                                                       |
|------------------|-----------------------------------|-------------------------------------------------------|
| <b>Parameter</b> | 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

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

## ipv6 mld snooping vlan last-member-query-interval

|                  |                                                                                                                                                                                     |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>ipv6 mld snooping vlan &lt;VLAN-LIST&gt; last-member-query-interval &lt;1-60&gt;</b><br><b>no ipv6 mld snooping vlan &lt;VLAN-LIST&gt; last-member-query-interval</b>            |
| <b>Parameter</b> | VLAN-LIST specifies VLAN ID list to set<br>last-member-query-interval <1-60> specifies last member query interval to set                                                            |
| <b>Default</b>   | Default is 1                                                                                                                                                                        |
| <b>Mode</b>      | Global Configuration                                                                                                                                                                |
| <b>Usage</b>     | Use the <b>ipv6 mld snooping vlan last-member-query-interval</b> command to set interval between each query packet.<br>Use the <b>no</b> 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 |

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

### ipv6 mld snooping vlan robustness-variable

|                  |                                                                                                                                                                                                                                   |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>ipv6 mld snooping vlan &lt;VLAN-LIST&gt; robustness-variable &lt;1-7&gt;</b><br><b>no ipv6 mld snooping vlan &lt;VLAN-LIST&gt; robustness-variable</b>                                                                         |
| <b>Parameter</b> | VLAN-LIST specifies VLAN ID list to set<br>robustness-variable specifies a robustness value to set<br><1-7>                                                                                                                       |
| <b>Default</b>   | Default is 2                                                                                                                                                                                                                      |
| <b>Mode</b>      | Global Configuration                                                                                                                                                                                                              |
| <b>Usage</b>     | Use the <b>ipv6 mld snooping vlan robustness-variable</b> command to times to retry.<br>Use the <b>no</b> form of this command to restore to default<br>You can verify settings by the <b>show ipv6 mld snooping vlan</b> command |
| <b>Example</b>   | The following example specifies that set ipv6 mld snooping vlan parameters test.<br>Switch(config)# <b>ip igmp snooping vlan 1 robustness-variable</b>                                                                            |

### ipv6 mld snooping vlan router

|               |                                                                                                                                     |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b> | <b>ipv6 mld snooping vlan VLAN-LIST router learn pim-dvmrp</b><br><b>no ipv6 mld snooping vlan VLAN-LIST router learn pim-dvmrp</b> |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------|



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

### ipv6 mld snooping vlan static-port

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

## ipv6 mld snooping vlan forbidden-router-port

|                  |                                                                                                                                                                                                                                                                                                                                                                                     |           |                               |          |                                        |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------------------------------|----------|----------------------------------------|
| <b>Syntax</b>    | <b>ipv6 mld snooping vlan &lt;VLAN-LIST&gt; forbidden-router-port IF_PORTS</b><br><b>no ipv6 mld snooping vlan &lt;VLAN-LIST&gt; forbidden-router-port IF_PORTS</b>                                                                                                                                                                                                                 |           |                               |          |                                        |
| <b>Parameter</b> | <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                                                                                                                                                                                                                                                                                                                                              |           |                               |          |                                        |
| <b>Default</b>   | No forbidden router ports by default                                                                                                                                                                                                                                                                                                                                                |           |                               |          |                                        |
| <b>Mode</b>      | Global Configuration                                                                                                                                                                                                                                                                                                                                                                |           |                               |          |                                        |
| <b>Usage</b>     | Use the <b>ipv6 mld snooping vlan forbidden-router-port</b> 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 <b>no</b> form of this command to delete forbidden router port. You can verify settings by the <b>show ipv6 mld snooping router</b> command. |           |                               |          |                                        |
| <b>Example</b>   | The following example specifies that set ipv6 mld snooping forbidden test.<br>Switch(config)# <b>ipv6 mld snooping vlan 1 forbidden-router-port gi2</b>                                                                                                                                                                                                                             |           |                               |          |                                        |

## ipv6 mld snooping vlan forbidden-router-port

|                  |                                                                                                                                                                               |           |                               |          |                                        |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------------------------------|----------|----------------------------------------|
| <b>Syntax</b>    | <b>ipv6 mld snooping vlan &lt;VLAN-LIST&gt; forbidden-router-port IF_PORTS</b><br><b>no ipv6 mld snooping vlan &lt;VLAN-LIST&gt; forbidden-router-port IF_PORTS</b>           |           |                               |          |                                        |
| <b>Parameter</b> | <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                                                                                                                                        |           |                               |          |                                        |
| <b>Default</b>   | No forbidden router ports by default                                                                                                                                          |           |                               |          |                                        |
| <b>Mode</b>      | Global Configuration                                                                                                                                                          |           |                               |          |                                        |

|                |                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Usage</b>   | Use the <b>ipv6 mld snooping vlan forbidden-router-port</b> 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.<br>Use the <b>no</b> form of this command to delete forbidden router port.<br>You can verify settings by the <b>show ipv6 mld snooping router</b> command. |
| <b>Example</b> | The following example specifies that set ipv6 mld snooping forbidden test.<br>Switch(config)# <b>ipv6 mld snooping vlan 1 forbidden-router-port gi2</b>                                                                                                                                                                                                                                   |

## ipv6 mld snooping vlan static router port

|                  |                                                                                                                                                                                                                                                                                                   |           |                               |          |                                        |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------------------------------|----------|----------------------------------------|
| <b>Syntax</b>    | <b>ipv6 mld snooping vlan &lt;VLAN-LIST&gt; static-router-port IF_PORTS</b><br><b>no ipv6 mld snooping vlan &lt;VLAN-LIST&gt; static-router-port IF_PORTS</b>                                                                                                                                     |           |                               |          |                                        |
| <b>Parameter</b> | <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                                                                                                                                                                                                                                                            |           |                               |          |                                        |
| <b>Default</b>   | None static router ports by default                                                                                                                                                                                                                                                               |           |                               |          |                                        |
| <b>Mode</b>      | Global Configuration                                                                                                                                                                                                                                                                              |           |                               |          |                                        |
| <b>Usage</b>     | Use the <b>ipv6 mld snooping vlan static-router-port</b> command to add static router port. All query packets will forward to this port.<br>Use the <b>no</b> form of this command to delete static router port.<br>You can verify settings by the <b>show ipv6 mld snooping router</b> command.. |           |                               |          |                                        |
| <b>Example</b>   | The following example specifies that set ipv6 mld snooping static test.<br>Switch(config)# <b>ipv6 mld snooping vlan 1 static-router-port gi1-2</b>                                                                                                                                               |           |                               |          |                                        |

## ipv6 mld snooping vlan static-group

|                  |                                                                                                                                                                                                                                   |           |                               |           |                                        |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------------------------------|-----------|----------------------------------------|
| <b>Syntax</b>    | <b>ipv6 mld snooping vlan &lt;VLAN-LIST&gt; static-group [&lt;ipv6-addr&gt;]</b><br><b>interfaces IF_PORTS</b><br><b>no ipv6 mld snooping vlan &lt;VLAN-LIST&gt; static-group &lt;ipv6-addr&gt;</b><br><b>interfaces IF_PORTS</b> |           |                               |           |                                        |
| <b>Parameter</b> | <table border="1"> <tr> <td>VLAN-LIST</td> <td>specifies VLAN ID list to set</td> </tr> <tr> <td>Ipv6-addr</td> <td>specifies multicast group ipv4 address</td> </tr> </table>                                                    | VLAN-LIST | specifies VLAN ID list to set | Ipv6-addr | specifies multicast group ipv4 address |
| VLAN-LIST        | specifies VLAN ID list to set                                                                                                                                                                                                     |           |                               |           |                                        |
| Ipv6-addr        | specifies multicast group ipv4 address                                                                                                                                                                                            |           |                               |           |                                        |

|                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                | IF_PORTS specifies port list to set or remove                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Default</b> | No static group by default                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Mode</b>    | Global Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Usage</b>   | <p>Use the <b>ipv6 mld snooping vlan static-group</b> 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 <b>no</b> 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 <b>show ipv6 mld snooping group</b> command.</p> |
| <b>Example</b> | <p>The following example specifies that set ipv6 mld snooping static group test.</p> <pre>Switch(config)# <b>ipv6 mld snooping vlan 1 static-group ff13::1 interfaces gi1-2</b></pre>                                                                                                                                                                                                                                                                                                                                                                      |

## ipv6 mld snooping vlan group

|                  |                                                                                                                                                                                                      |           |                               |           |                                        |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------------------------------|-----------|----------------------------------------|
| <b>Syntax</b>    | <b>no ipv6 mld snooping vlan &lt;VLAN-LIST&gt; group &lt;ipv6-addr&gt;</b>                                                                                                                           |           |                               |           |                                        |
| <b>Parameter</b> | <table border="1"> <tr> <td>VLAN-LIST</td> <td>specifies VLAN ID list to set</td> </tr> <tr> <td>ipv6-addr</td> <td>specifies multicast group ipv6 address</td> </tr> </table>                       | VLAN-LIST | specifies VLAN ID list to set | ipv6-addr | specifies multicast group ipv6 address |
| VLAN-LIST        | specifies VLAN ID list to set                                                                                                                                                                        |           |                               |           |                                        |
| ipv6-addr        | specifies multicast group ipv6 address                                                                                                                                                               |           |                               |           |                                        |
| <b>Default</b>   | None                                                                                                                                                                                                 |           |                               |           |                                        |
| <b>Mode</b>      | Global Configuration                                                                                                                                                                                 |           |                               |           |                                        |
| <b>Usage</b>     | <p>Use the <b>no ipv6 mld snooping vlan group</b> command to delete a group which could be static or dynamic.</p> <p>You can verify settings by the <b>show ipv6 mld snooping group</b> command.</p> |           |                               |           |                                        |
| <b>Example</b>   | <p>The following example specifies that set ip igmp snooping static group test.</p> <pre>Switch(config)# <b>no ip igmp snooping vlan 1 group ff13::1</b></pre>                                       |           |                               |           |                                        |

## 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<br>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

|                |                                                                                                                                                                                                        |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Usage</b>   | Use the <b>ipv6 mld profile</b> command to enter profile configuration Use the <b>no</b> form of this command to delete profile<br>You can verify settings by the <b>show ipv6 mld profile</b> command |
| <b>Example</b> | The following example specifies that set ipv6 mld profile test.<br>Switch(config)# <b>ipv6 mld profile 1</b><br>Switch(config-mld-profile)# <b>profile range ipv6 ff13::1 ff13::10 action permit</b>   |

## ipv6 mld filter

|                              |                                                                                                                                                                                                                                                                                                                                                                                           |                      |                      |                              |                                 |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|----------------------|------------------------------|---------------------------------|
| <b>Syntax</b>                | <b>ipv6 mld filter &lt;1-128&gt;</b><br><b>no ipv6 mld filter</b>                                                                                                                                                                                                                                                                                                                         |                      |                      |                              |                                 |
| <b>Parameter</b>             | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;"><b>&lt;1-128&gt;</b></td> <td>specifies profile ID</td> </tr> <tr> <td><b>[interfaces IF_PORTS]</b></td> <td>Specifies interfaces to display</td> </tr> </table>                                                                                                                          | <b>&lt;1-128&gt;</b> | specifies profile ID | <b>[interfaces IF_PORTS]</b> | Specifies interfaces to display |
| <b>&lt;1-128&gt;</b>         | specifies profile ID                                                                                                                                                                                                                                                                                                                                                                      |                      |                      |                              |                                 |
| <b>[interfaces IF_PORTS]</b> | Specifies interfaces to display                                                                                                                                                                                                                                                                                                                                                           |                      |                      |                              |                                 |
| <b>Default</b>               | None                                                                                                                                                                                                                                                                                                                                                                                      |                      |                      |                              |                                 |
| <b>Mode</b>                  | Port Configuration                                                                                                                                                                                                                                                                                                                                                                        |                      |                      |                              |                                 |
| <b>Usage</b>                 | Use the <b>ipv6 mld filter</b> 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.<br>Use the <b>no</b> form of this command to delete profile<br>You can verify settings by the <b>show ipv6 mld filter</b> command |                      |                      |                              |                                 |
| <b>Example</b>               | The following example specifies that set ipv6 mld filter test.<br><br>Switch(config)# <b>interface gi1</b><br>Switch(config-if)# <b>ipv6 mld filter 1</b>                                                                                                                                                                                                                                 |                      |                      |                              |                                 |

## ipv6 mld max-groups

|               |                                                                            |
|---------------|----------------------------------------------------------------------------|
| <b>Syntax</b> | <b>ipv6 mld max-groups &lt;0-1024&gt;</b><br><b>no ipv6 mld max-groups</b> |
|---------------|----------------------------------------------------------------------------|

|                  |                                                                                                                                                                                                                                                                                                                                            |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Parameter</b> | <0-1024> specifies profile ID                                                                                                                                                                                                                                                                                                              |
| <b>Default</b>   | Default is 1024                                                                                                                                                                                                                                                                                                                            |
| <b>Mode</b>      | Port Configuration                                                                                                                                                                                                                                                                                                                         |
| <b>Usage</b>     | <p>Use the <b>ipv6 mld max-groups</b> 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 <b>no</b> form of this command to restore to default<br/>You can verify settings by the <b>show ipv6 mld max-groups</b> command.</p> |
| <b>Example</b>   | <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

|                  |                                                                                                                                                                                                                                                                             |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>ipv6 mld max-groups action (deny   replace)</b>                                                                                                                                                                                                                          |
| <b>Parameter</b> | <p>(deny   replace) Deny: current port igmp group arrived max-groups, don't add group.<br/>Replace: current port igmp group arrived max-groups, remove port for rand group, and add port to new group.</p>                                                                  |
| <b>Default</b>   | Default action is deny                                                                                                                                                                                                                                                      |
| <b>Mode</b>      | Interface mode                                                                                                                                                                                                                                                              |
| <b>Usage</b>     | <p>Use the <b>ipv6 mld max-groups action</b> command to set the action when the numbers of groups reach the limitation.</p> <p>Use the <b>no</b> form of this command to restore to default<br/>You can verify settings by the <b>show ipv6 mld max-groups</b> command.</p> |
| <b>Example</b>   | <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

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

## clear ipv6 mld snooping statistics

|                  |                                                                                                                                    |
|------------------|------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>clear ipv6 mld snooping statistics</b>                                                                                          |
| <b>Parameter</b> | none                                                                                                                               |
| <b>Default</b>   | None                                                                                                                               |
| <b>Mode</b>      | Privileged EXEC                                                                                                                    |
| <b>Usage</b>     | This command will clear the igmp statistics.<br>You can verify settings by the <b>show ipv6 mld snooping</b> command.              |
| <b>Example</b>   | The following example specifies that clear ipv6 mld snooping statistics test.<br>Switch# <b>clear ipv6 mld snooping statistics</b> |



## show ipv6 mld snooping groups counters

|                  |                                                                                                                                                                                       |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | show ipv6 mld snooping groups counters                                                                                                                                                |
| <b>Parameter</b> | none                                                                                                                                                                                  |
| <b>Default</b>   | None                                                                                                                                                                                  |
| <b>Mode</b>      | Privileged EXEC                                                                                                                                                                       |
| <b>Usage</b>     | This command will display the ipv6 mld group counter include static group.                                                                                                            |
| <b>Example</b>   | The following example specifies that display ipv6 mld snooping group counter test.<br>Switch# <b>show ipv6 mld snooping group counters</b><br>Total ipv6 mld snooping group number: 2 |

## show ipv6 mld snooping groups

| <b>Syntax</b>    | show ipv6 mld snooping groups [(dynamic   static)]                                                                                                                                                                                                                                                                                                                                                                                                          |        |                  |      |           |      |   |         |        |    |     |   |         |        |    |     |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------------------|------|-----------|------|---|---------|--------|----|-----|---|---------|--------|----|-----|
| <b>Parameter</b> | none Show ipv6 mld groups include dynamic and static<br>(dynamic   static) Display ipv6 mld group type is dynamic or static                                                                                                                                                                                                                                                                                                                                 |        |                  |      |           |      |   |         |        |    |     |   |         |        |    |     |
| <b>Default</b>   | display all ipv6 mld groups                                                                                                                                                                                                                                                                                                                                                                                                                                 |        |                  |      |           |      |   |         |        |    |     |   |         |        |    |     |
| <b>Mode</b>      | Privileged EXEC                                                                                                                                                                                                                                                                                                                                                                                                                                             |        |                  |      |           |      |   |         |        |    |     |   |         |        |    |     |
| <b>Usage</b>     | This command will display the ipv6 mld groups for dynamic or static or all of type.                                                                                                                                                                                                                                                                                                                                                                         |        |                  |      |           |      |   |         |        |    |     |   |         |        |    |     |
| <b>Example</b>   | The following example specifies that show ipv6 mld snooping groups test.<br>Switch# <b>show ipv6 mld snooping groups</b><br><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

|                  |                                                                                                                                                                                                                                                                                                                                                                        |                                                               |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|
| <b>Syntax</b>    | <b>show ipv6 mld snooping router [(dynamic   forbidden  static )]</b>                                                                                                                                                                                                                                                                                                  |                                                               |
| <b>Parameter</b> | none                                                                                                                                                                                                                                                                                                                                                                   | Show ipv6 mld router include dynamic and static and forbidden |
|                  | (dynamic   forbidden   static)                                                                                                                                                                                                                                                                                                                                         | Display ipv6 mld router info for different type               |
| <b>Default</b>   | None                                                                                                                                                                                                                                                                                                                                                                   |                                                               |
| <b>Mode</b>      | Privileged EXEC                                                                                                                                                                                                                                                                                                                                                        |                                                               |
| <b>Usage</b>     | This command will display the ipv6 mld router info.                                                                                                                                                                                                                                                                                                                    |                                                               |
| <b>Example</b>   | <p>The following example specifies that show ipv6 mld snooping router test.</p> <pre>Switch# <b>show ipv6 mld snooping router</b> 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

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>show ipv6 mld snooping</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Parameter</b> | none                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Default</b>   | None                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Mode</b>      | Privileged EXEC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Usage</b>     | This command will display ipv6 mld snooping global info.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Example</b>   | <p>The following example specifies that show ipv6 mld snooping test.</p> <pre>Switch# <b>show ipv6 mld snooping</b>       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 &amp; Source Query RX : 0       Leave TX                : 0       Report TX               : 0       General Query TX        : 0       Specail Group Query TX  : 0       Specail Group &amp; Source Query TX : 0</pre> |

## show ipv6 mld snooping vlan

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |      |                                      |             |                                            |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|--------------------------------------|-------------|--------------------------------------------|
| <b>Syntax</b>    | <b>show ipv6 mld snooping vlan [VLAN-LIST]</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |      |                                      |             |                                            |
| <b>Parameter</b> | <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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |      |                                      |             |                                            |
| <b>Default</b>   | Show all ipv6 mld snooping vlan info                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |      |                                      |             |                                            |
| <b>Mode</b>      | Privileged EXEC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |      |                                      |             |                                            |
| <b>Usage</b>     | This command will display ipv6 mld snooping vlan info.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |      |                                      |             |                                            |
| <b>Example</b>   | <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

|                  |                                                                                                                                                                                                            |      |                                                  |                  |                                               |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|--------------------------------------------------|------------------|-----------------------------------------------|
| <b>Syntax</b>    | <b>show ipv6 mld snooping forward-all [vlan VLAN-LIST]</b>                                                                                                                                                 |      |                                                  |                  |                                               |
| <b>Parameter</b> | <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.                                                                                                                                                              |      |                                                  |                  |                                               |
| <b>Default</b>   | Show all vlan ipv6 mld forward all info                                                                                                                                                                    |      |                                                  |                  |                                               |
| <b>Mode</b>      | Privileged EXEC                                                                                                                                                                                            |      |                                                  |                  |                                               |
| <b>Usage</b>     | 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

|                  |                                                                                                                                                                                      |      |                                         |           |                                   |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------------------------------------|-----------|-----------------------------------|
| <b>Syntax</b>    | <b>show ipv6 mld profile [&lt;1-128&gt;]</b>                                                                                                                                         |      |                                         |           |                                   |
| <b>Parameter</b> | <table border="1"> <tr> <td>none</td> <td>Show all ipv6 mld snooping profile info</td> </tr> <tr> <td>[&lt;1-128&gt;]</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                                                                                                                                                    |      |                                         |           |                                   |
| <b>Default</b>   | Show all ipv6 mld profile info                                                                                                                                                       |      |                                         |           |                                   |
| <b>Mode</b>      | Privileged EXEC                                                                                                                                                                      |      |                                         |           |                                   |
| <b>Usage</b>     | 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

|                       |                                                                                                                                                                   |      |                      |                       |                             |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----------------------|-----------------------|-----------------------------|
| <b>Syntax</b>         | <b>show ipv6 mld filter [interfaces IF_PORTS]</b>                                                                                                                 |      |                      |                       |                             |
| <b>Parameter</b>      | <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                                                                                                                                       |      |                      |                       |                             |
| <b>Default</b>        | None                                                                                                                                                              |      |                      |                       |                             |
| <b>Mode</b>           | 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

|                       |                                                                                                                                                                                                                                                                                                                                       |      |                                |                       |                                       |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|--------------------------------|-----------------------|---------------------------------------|
| <b>Syntax</b>         | <b>show ipv6 mld max-group action [interfaces IF_PORTS]</b>                                                                                                                                                                                                                                                                           |      |                                |                       |                                       |
| <b>Parameter</b>      | <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                                                                                                                                                                                                                                                                                                 |      |                                |                       |                                       |
| <b>Default</b>        | Show all ports ipv6 mld max-group action                                                                                                                                                                                                                                                                                              |      |                                |                       |                                       |
| <b>Mode</b>           | Privileged EXEC                                                                                                                                                                                                                                                                                                                       |      |                                |                       |                                       |
| <b>Usage</b>          | This command will display ipv6 mld port max-group action.                                                                                                                                                                                                                                                                             |      |                                |                       |                                       |
| <b>Example</b>        | <p>The following example specifies that show ipv6 mld max-group action test.</p> <pre>Switch(config-if)# <b>ipv6 mld max-groups action replace</b> Switch# <b>show ipv6 mld max-group action</b> Port ID   Max-groups Action -----+-----     gi1 : replace     gi2 : deny     gi3 : deny     gi4 : deny     gi5 : deny --More--</pre> |      |                                |                       |                                       |

## 20. MVR

### mvr

|                  |                             |
|------------------|-----------------------------|
| <b>Syntax</b>    | <b>mvr</b><br><b>no mvr</b> |
| <b>Parameter</b> | None                        |
| <b>Default</b>   | Default is disabled         |
| <b>Mode</b>      | Global Configuration        |

|                |                                                                                                                                                                                                                                                                                                                                                                                   |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Usage</b>   | Use the <b>mvr</b> command to enable MVR function. The command will clear all mvr VLAN ID multicast snooping group.<br>Use the <b>no</b> form of this command to disable. Disable will clear all mvr group.<br>You can verify settings by the <b>show mvr</b> command.                                                                                                            |
| <b>Example</b> | The following example specifies that set <b>mvr</b> test.<br>Switch(config)# <b>mvr</b><br>Switch(config)# <b>no mvr</b><br>Switch# <b>show mvr</b><br><b>MVR Running : Disabled</b><br>MVR Multicast VLAN : 1<br>MVR Group Range : None<br>MVR Max Multicast Groups : 128 MVR<br>Current Multicast Groups : 0 MVR<br>Global query response time : 1 sec<br>MVR Mode : compatible |

## mvr vlan

|                  |                                                                                                                                                                                                                                                                                                                                                                                                      |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>mvr vlan &lt;VLAN-ID&gt;</b>                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Parameter</b> | <VLAN-ID>      The exist static vlan id                                                                                                                                                                                                                                                                                                                                                              |
| <b>Default</b>   | Default mvr vlan id is 1                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Mode</b>      | Global Configuration                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Usage</b>     | Use the <b>mvr vlan</b> command to modify mvr vlan id when the mvr status is enabled.<br>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.<br>You can verify settings by the <b>show mvr</b> command.              |
| <b>Example</b>   | The following example specifies that configure mvr vlan 2 test.<br>Switch(config)# <b>vlan 2</b><br>Switch(config)# <b>mvr</b><br><b>The operation will delete groups of VLAN ID is MVR VLAN include static groups. Continue? [yes/no]:y</b><br>Switch(config)# <b>mvr vlan 2</b><br><b>The operation will delete the old and new MVR VLAN groups include static MVR groups.Continue? [yes/no]:y</b> |



---

**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. |

---

|                |      |
|----------------|------|
| <b>Default</b> | None |
|----------------|------|

---

|             |                      |
|-------------|----------------------|
| <b>Mode</b> | Global Configuration |
|-------------|----------------------|

---

|              |                                                                                                                                                                                                         |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Usage</b> | Use the <b>mvr group</b> 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 <b>show mvr</b> command |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

---

|                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Example</b> | <p>The following example specifies that set mvr group range is 224.1.1.1 ~ 224.1.1.8 test.</p> <pre>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</pre> |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

---

## mvr mode

|               |                                        |
|---------------|----------------------------------------|
| <b>Syntax</b> | <b>mvr mode (dynamic   compatible)</b> |
|---------------|----------------------------------------|

---

|                  |                      |                                           |
|------------------|----------------------|-------------------------------------------|
| <b>Parameter</b> | (dynamic compatible) | dynamic: Allows dynamic MVR membership on |
|------------------|----------------------|-------------------------------------------|

---



---

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

---



---

**Default**            Default is compatible.

---

**Mode**                Global Configuration

---

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

---

**Example**             The following example specifies that set mvr mode dynamic test.  
Switch(config)#**mvr**  
Switch(config)#**mvr mode dynamic**  
Switch# **show mvr**  
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.<br>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

|                  |                                                                                                                                                                                                                                                                                                                                                                                                |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>mvr immediate</b><br><b>no mvr immediate</b>                                                                                                                                                                                                                                                                                                                                                |
| <b>Parameter</b> | None                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Default</b>   | Default is disabled                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Mode</b>      | Port Configuration                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Usage</b>     | Use the <b>mvr immediate</b> command to configure mvr support immediate leave when mvr is enabled.<br><b>Note</b> 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 <b>no</b> form of this command to disable immediate leave. You can verify settings by the <b>show mvr interface</b> command |

**Example**

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

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

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

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

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

```
Switch# show mvr interface
```

```
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 |
| <b>Default</b> | Clear all of mvr group                                                                              |                            |
| <b>Mode</b>    | Privileged EXEC                                                                                     |                            |
| <b>Usage</b>   | This command will clear the mvr groups for selected type.                                           |                            |
| <b>Example</b> | The following example specifies that clear all mvr groups test.<br>Switch# <b>clear mvr members</b> |                            |

### show mvr members

|                  |                                                                                               |  |
|------------------|-----------------------------------------------------------------------------------------------|--|
| <b>Syntax</b>    | show mvr members                                                                              |  |
| <b>Parameter</b> | None                                                                                          |  |
| <b>Default</b>   | None                                                                                          |  |
| <b>Mode</b>      | Privileged EXEC                                                                               |  |
| <b>Usage</b>     | This command will display the mvr groups for all of type.                                     |  |
| <b>Example</b>   | The following example specifies that show mvr groups test.<br>Switch# <b>show mvr members</b> |  |

### show mvr interface

|                  |                               |                                        |
|------------------|-------------------------------|----------------------------------------|
| <b>Syntax</b>    | show mvr interface [IF_PORTS] |                                        |
| <b>Parameter</b> | IF_PORTS                      | Show specifies port list configuration |
| <b>Default</b>   | None                          |                                        |

|                |                                                                                                    |
|----------------|----------------------------------------------------------------------------------------------------|
| <b>Mode</b>    | Privileged EXEC                                                                                    |
| <b>Usage</b>   | This command will display mvr port type and port immediate status.                                 |
| <b>Example</b> | The following example specifies that show mvr interface test.<br>Switch# <b>show mvr interface</b> |

## show mvr

|                  |                                                                                                                                                                                                                                                                                                                           |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>show mvr</b>                                                                                                                                                                                                                                                                                                           |
| <b>Parameter</b> | None                                                                                                                                                                                                                                                                                                                      |
| <b>Default</b>   | None                                                                                                                                                                                                                                                                                                                      |
| <b>Mode</b>      | Privileged EXEC                                                                                                                                                                                                                                                                                                           |
| <b>Usage</b>     | This command will display mvr global information.                                                                                                                                                                                                                                                                         |
| <b>Example</b>   | The following example specifies that show mvr test.<br>Switch# <b>show mvr</b><br>MVR Running : Enabled<br>MVR Multicast VLAN : 100<br>MVR Group Range : 224.1.1.1 ~ 224.1.1.128<br>MVR Max Multicast Groups : 128 MVR<br>Current Multicast Groups : 0 MVR<br>Global query response time : 1 sec<br>MVR Mode : compatible |

## 21. Port

### back-pressure

---

|                  |                                                                                                                                                                                                                                                                                                                                                                |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>back-pressure</b><br><b>no back-pressure</b>                                                                                                                                                                                                                                                                                                                |
| <b>Parameter</b> |                                                                                                                                                                                                                                                                                                                                                                |
| <b>Default</b>   | Default back pressure state is enabled.                                                                                                                                                                                                                                                                                                                        |
| <b>Mode</b>      | Interface Configuration                                                                                                                                                                                                                                                                                                                                        |
| <b>Usage</b>     | Use “ <b>back-pressure</b> ” command to make port to enable back pressure feature.<br><br>Use <b>no</b> form of this command to disable back pressure feature.<br><br>The only way to show this configuration is using “ <b>show running-config</b> ” command.                                                                                                 |
| <b>Example</b>   | <hr/> <p>This example shows how to configure port fa1 and fa2 to be protected port.</p> <pre>Switch(config)# <b>interface fa1</b><br/>Switch(config-if)# <b>no back-pressure</b></pre> <p>This example shows how to show current jumbo-frame size</p> <pre>Switch# <b>show running-config interface fa1</b><br/>interface fa1<br/>no back-pressure</pre> <hr/> |

## clear interface

---

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

|             |                                           |
|-------------|-------------------------------------------|
| <b>auto</b> | Specify port duplex to auto negotiation.  |
| <b>full</b> | Specify port duplex to force full duplex. |
| <b>half</b> | 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

|                |                                                                                                                                                                                                                                                       |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Default</b> | Default eee state is disabled.                                                                                                                                                                                                                        |
| <b>Mode</b>    | Interface Configuration                                                                                                                                                                                                                               |
| <b>Usage</b>   | <p>Use “<b>eee</b>” command to make port to enable the energy efficient Ethernet feature.</p> <p>Use <b>no</b> form of this command to disable eee.</p> <p>The only way to show this configuration is using “<b>show running-config</b>” command.</p> |

|                |                                                                                                                                                                                                                                                                                                                |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Example</b> | <p>This example shows how to configure port fa1 and fa2 to be protected port.</p> <pre>Switch(config)# <b>interface fa1</b> Switch(config-if)# <b>eee</b></pre> <p>This example shows how to show current jumbo-frame size</p> <pre>Switch# <b>show running-config interface fa1</b> interface fa1   eee</pre> |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## flowcontrol

|                  |                                                                                                                                                                                                                                                                                                                    |             |                                                                  |            |                            |           |                           |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------------------------------------------------------------|------------|----------------------------|-----------|---------------------------|
| <b>Syntax</b>    | <b>flowcontrol (auto   off   on)</b><br><b>no flowcontrol</b>                                                                                                                                                                                                                                                      |             |                                                                  |            |                            |           |                           |
| <b>Parameter</b> | <table border="1" style="width: 100%;"> <tr> <td style="width: 15%;"><b>auto</b></td> <td>Automatically enables or disables flow control on the interface.</td> </tr> <tr> <td><b>off</b></td> <td>Disable port flow control.</td> </tr> <tr> <td><b>on</b></td> <td>Enable port flow control.</td> </tr> </table> | <b>auto</b> | Automatically enables or disables flow control on the interface. | <b>off</b> | Disable port flow control. | <b>on</b> | Enable port flow control. |
| <b>auto</b>      | Automatically enables or disables flow control on the interface.                                                                                                                                                                                                                                                   |             |                                                                  |            |                            |           |                           |
| <b>off</b>       | Disable port flow control.                                                                                                                                                                                                                                                                                         |             |                                                                  |            |                            |           |                           |
| <b>on</b>        | Enable port flow control.                                                                                                                                                                                                                                                                                          |             |                                                                  |            |                            |           |                           |
| <b>Default</b>   | Default port flow control is off.                                                                                                                                                                                                                                                                                  |             |                                                                  |            |                            |           |                           |
| <b>Mode</b>      | Interface Configuration                                                                                                                                                                                                                                                                                            |             |                                                                  |            |                            |           |                           |
| <b>Usage</b>     | <p>Use “<b>flowcontrol</b>” command to change port flow control configuration.</p> <p>Use <b>no</b> form to restore flow control to default (off) configuration.</p>                                                                                                                                               |             |                                                                  |            |                            |           |                           |

---

**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**

|                  |                                                                                                                                                        |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Parameter</b> | <b>auto-select</b> Select media automatically.                                                                                                         |
|                  | <b>rj45</b> Select copper media.                                                                                                                       |
|                  | <b>sfp</b> Select fiber media.                                                                                                                         |
| <b>Default</b>   | Default media type is auto.                                                                                                                            |
| <b>Mode</b>      | Interface Configuration                                                                                                                                |
| <b>Usage</b>     | Use “ <b>media-type</b> ” command to change combo port media type.<br><br>Use <b>no</b> form of this command to restore media type to default.         |
| <b>Example</b>   | This example shows how to modify combo port media type to copper.<br>Switch(config)# <b>interface gil</b><br>Switch(config-if)# <b>media-type rj45</b> |

## protected

|                |                                                                                                                                                                                                                                                                                                                                                                |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>  | <b>protected</b><br><b>no protected</b>                                                                                                                                                                                                                                                                                                                        |
| <b>Default</b> | Default protected state is no protected.                                                                                                                                                                                                                                                                                                                       |
| <b>Mode</b>    | Interface Configuration                                                                                                                                                                                                                                                                                                                                        |
| <b>Usage</b>   | Use “ <b>protected</b> ” 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.<br><br>Use <b>no</b> form to make port unprotected.                                                                              |
| <b>Example</b> | This example shows how to configure port fa1 and fa2 to be protected port.<br>Switch(config)# <b>interface range fa1-2</b><br>Switch(config-if-range)# <b>protected</b><br><br>This example shows how to show current protected port state.<br>Switch# <b>show interfaces fa1-2 protected</b><br>Port          Protected State<br>-----+-----<br>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

|               |                                                                         |
|---------------|-------------------------------------------------------------------------|
| <b>10</b>     | Specify port speed to force 10Mbps/s or auto with 10Mbps/s ability.     |
| <b>100</b>    | Specify port speed to force 100Mbps/s or auto with 100Mbps/s ability.   |
| <b>1000</b>   | Specify port speed to force 1000Mbps/s or auto with 1000Mbps/s ability. |
| <b>10/100</b> | 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  |      | <b>disable</b> | 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)**

|                  |                               |                                                                                             |
|------------------|-------------------------------|---------------------------------------------------------------------------------------------|
| <b>Parameter</b> | <b>all</b>                    | Enable the auto recovery for port error disabled from all causes.                           |
|                  | <b>acl</b>                    | Enable the auto recovery for port error disabled from the ACL cause.                        |
|                  | <b>arp-inspection</b>         | Enable the auto recovery for port error disabled from the ARP inspection cause.             |
|                  | <b>bpduguard</b>              | Enable the auto recovery for port error disabled from the STP BPDU Guard cause.             |
|                  | <b>broadcast-flood</b>        | Enable the auto recovery for port error disabled from the broadcast flooding cause.         |
|                  | <b>dhcp-rate-limit</b>        | Enable the auto recovery for port error disabled from the DHCP rate limit cause.            |
|                  | <b>psecure-violation</b>      | Enable the auto recovery for port error disabled from the port security cause.              |
|                  | <b>selfloop</b>               | Enable the auto recovery for port error disabled from the STP self-loop cause.              |
|                  | <b>unicast-flood</b>          | Enable the auto recovery for port error disabled from the unicast flooding cause.           |
|                  | <b>unknown-multicastflood</b> | 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*

|                  |                |                                                                                                                                                  |
|------------------|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Parameter</b> | <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. |
|------------------|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------|

|                |                                                                                                                                            |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Default</b> | The default recovery time is 300 seconds.                                                                                                  |
| <b>Mode</b>    | Global Configuration                                                                                                                       |
| <b>Usage</b>   | To set the recovery time of the error disabled ports, use the command <b>errdisable recover interval</b> in the Global Configuration mode. |
| <b>Example</b> | The following example set the aging time to 500 seconds.<br><br><pre>Switch(config)# errdisable recovery interval 60</pre>                 |

### show errdisable recovery

|                  |                                                                                                                                                                      |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>show errdisable recovery</b>                                                                                                                                      |
| <b>Parameter</b> | N/A                                                                                                                                                                  |
| <b>Default</b>   | N/A                                                                                                                                                                  |
| <b>Mode</b>      | Privileged EXEC                                                                                                                                                      |
| <b>Usage</b>     | To show the error disable configuration and the interfaces in the error disabled state, use the command <b>show errdisable recovery</b> in the Privileged EXEC mode. |
| <b>Example</b>   | The following example shows the error disable configuration, and the interfaces in the error disabled state.                                                         |

```
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
```

---

Interfaces that will be enabled at the next timeout:

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

---

## 23. Port Security

### port-security (Global)

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

### port-security (Interface)

|                  |                                                 |
|------------------|-------------------------------------------------|
| <b>Syntax</b>    | <b>port-security</b><br><b>no port-security</b> |
| <b>Parameter</b> | None                                            |
| <b>Default</b>   | Default is disabled                             |
| <b>Mode</b>      | 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**

|                  |                 |                                                                                                             |
|------------------|-----------------|-------------------------------------------------------------------------------------------------------------|
| <b>Parameter</b> | <1-256>         | The learning-limit number. It specifies how many MAC addresses this port can learn.                         |
|                  | <b>forward</b>  | Forward this packet whose SMAC is new to system and exceed the learning-limit number.                       |
|                  | <b>discard</b>  | Discard this packet whose SMAC is new to system and exceed the learning-limit number.                       |
|                  | <b>shutdown</b> | 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)

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>vlan protocol-vlan group</b> <1-8> <b>vlan</b> <1-4094><br><b>no vlan protocol-vlan group</b> <1-8>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Parameter</b> | <1-8> Specify protocol vlan group to binding<br><1-4094> Specifies the Proto VLAN ID to configure.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Default</b>   | In default all group are not binding to any interface.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Mode</b>      | Interface configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Usage</b>     | Use the <b>vlan protocol-vlan binding</b> Interface Configuration mode command to binding protocol VLAN Group on specified interfaces,<br>Use the <b>no</b> form of this command to cancel protocol VLAN Group Binding.<br>You can verify your setting by entering the <b>show vlan protocol-vlan interfaces IF_PORTS Privileged EXEC</b> command                                                                                                                                                                                                                                                                                |
| <b>Example</b>   | The following example how to configure Protocol VLAN function on specified interfaces..<br>Switch(config)# <b>interface fa1</b><br>Switch(config-if)# <b>vlan protocol-vlan group 1 vlan 2</b><br>Switch(config-if)# <b>vlan protocol-vlan group 2 vlan 3</b><br>Switch# <b>show vlan protocol-vlan interfaces fa1</b><br>Port fa1 :<br>Group 1<br>Status : Enabled<br>VLAN ID : 2<br>Group 2<br>Status : Enabled<br>VLAN ID : 3<br>Group 3<br>Status : Disabled<br>Group 4<br>Status : Disabled<br>Group 5<br>Status : Disabled<br>Group 6<br>Status : Disabled<br>Group 7<br>Status : Disabled<br>Group 8<br>Status : Disabled |

## show vlan protocol-vlan

| <b>Syntax</b>    | <code>show vlan protocol-vlan [group &lt;1-8&gt;]</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |           |        |      |       |   |         |          |        |   |         |           |        |   |          |    |    |   |          |    |    |   |          |    |    |   |          |    |    |   |          |    |    |   |          |    |    |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|--------|------|-------|---|---------|----------|--------|---|---------|-----------|--------|---|----------|----|----|---|----------|----|----|---|----------|----|----|---|----------|----|----|---|----------|----|----|---|----------|----|----|
| <b>Parameter</b> | <1-8> Specify protocol vlan group to display                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |           |        |      |       |   |         |          |        |   |         |           |        |   |          |    |    |   |          |    |    |   |          |    |    |   |          |    |    |   |          |    |    |   |          |    |    |
| <b>Default</b>   | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |           |        |      |       |   |         |          |        |   |         |           |        |   |          |    |    |   |          |    |    |   |          |    |    |   |          |    |    |   |          |    |    |   |          |    |    |
| <b>Mode</b>      | Privileged EXEC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |           |        |      |       |   |         |          |        |   |         |           |        |   |          |    |    |   |          |    |    |   |          |    |    |   |          |    |    |   |          |    |    |   |          |    |    |
| <b>Usage</b>     | Use the <b>show vlan proto-vlan</b> command in EXEC mode to display Proto VLAN group configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |           |        |      |       |   |         |          |        |   |         |           |        |   |          |    |    |   |          |    |    |   |          |    |    |   |          |    |    |   |          |    |    |   |          |    |    |
| <b>Example</b>   | <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

|                  |                                                          |
|------------------|----------------------------------------------------------|
| <b>Syntax</b>    | <code>show vlan protocol-vlan interfaces IF_PORTS</code> |
| <b>Parameter</b> | IF_PORTS Specify interfaces protocol vlan to display     |
| <b>Default</b>   | N/A                                                      |
| <b>Mode</b>      | Privileged EXEC                                          |

---

|                |                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Usage</b>   | Use the <b>show vlan protocol-vlan interface</b> command in EXEC mode to display the Protocol VLAN interfaces setting                                                                                                                                                                                                                                                                                                                   |
| <b>Example</b> | <p>The following example shows how to display the Protocol VLAN interfaces setting</p> <pre>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</pre> |

---

## 25. QoS

### qos

---

|                |                                                                                                                                                                                                                                                          |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>  | <b>qos</b><br><b>no qos</b>                                                                                                                                                                                                                              |
| <b>Default</b> | Default qos is disabled.                                                                                                                                                                                                                                 |
| <b>Mode</b>    | Global Configuration                                                                                                                                                                                                                                     |
| <b>Usage</b>   | <p>Use “<b>qos</b>” 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.</p> <p>Use no form of this command to disable quality of service.</p> |

|                |                                                                                                                                                                                                                       |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Example</b> | <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

|               |                      |
|---------------|----------------------|
| <b>Syntax</b> | <b>qos cos</b> <0-7> |
|---------------|----------------------|

|                  |                                                                                |
|------------------|--------------------------------------------------------------------------------|
| <b>Parameter</b> | <b>cos</b> <0-7>                      Specify the CoS value for the interface. |
|------------------|--------------------------------------------------------------------------------|

|                |                                       |
|----------------|---------------------------------------|
| <b>Default</b> | Default CoS value for interface is 0. |
|----------------|---------------------------------------|

|             |                         |
|-------------|-------------------------|
| <b>Mode</b> | Interface Configuration |
|-------------|-------------------------|

|              |                                                                                                                                                                                                                                                                                                                                                         |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Usage</b> | <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> |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Use “qos cos” command to assign port default cos value.

| <b>Example</b> | <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;"> <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

|               |                                                                                                                                                                                                                                                       |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b> | <p><b>qos map</b> (cos-queue   dscp-queue   precedence-queue) <i>SEQUENCE</i> to &lt;1-8&gt;</p> <p><b>qos map</b> (queue-cos   queue-precedence) <i>SEQUENCE</i> to &lt;0-7&gt;</p> <p><b>qos map</b> queue-dscp <i>SEQUENCE</i> to &lt;0-63&gt;</p> |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                  |                                                                       |
|------------------|-----------------------------------------------------------------------|
| <b>Parameter</b> | <b>cos-queue</b> Configure or show CoS to queue map                   |
|                  | <b>dscp-queue</b> Configure or show DSCP to queue map                 |
|                  | <b>precedence-queue</b> Configure or show IP Precedence to queue map. |
|                  | <b>queue-cos</b> Configure or show queue to CoS map                   |

|                         |                                                                         |
|-------------------------|-------------------------------------------------------------------------|
| <b>queue-dscp</b>       | Configure or show queue to DSCP map                                     |
| <b>queue-precedence</b> | 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

---

|                                  |                                                                                                    |
|----------------------------------|----------------------------------------------------------------------------------------------------|
| <b>strict-priority-num</b> <0-8> | Specify the strict priority queue number                                                           |
| <b>weight</b> 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

|                   |                                      |
|-------------------|--------------------------------------|
| <b>cos</b>        | Enable/Disable cos remarking.        |
| <b>dscp</b>       | Enable/Disable dscp remarking.       |
| <b>precedence</b> | 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

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |            |                                 |                 |                                                                                    |             |                                  |                   |                                           |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---------------------------------|-----------------|------------------------------------------------------------------------------------|-------------|----------------------------------|-------------------|-------------------------------------------|
| <b>Syntax</b>     | <code>qos trust (cos   cos-dscp   dscp   precedence)</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |                                 |                 |                                                                                    |             |                                  |                   |                                           |
| <b>Parameter</b>  | <table border="1"> <tr> <td><b>cos</b></td> <td>Specify the device to trust CoS</td> </tr> <tr> <td><b>cos-dscp</b></td> <td>Specify the device to trust DSCP for IP packets, and trust CoS for non-IP packets.</td> </tr> <tr> <td><b>dscp</b></td> <td>Specify the device to trust DSCP</td> </tr> <tr> <td><b>precedence</b></td> <td>Specify the device to trust IP Precedence</td> </tr> </table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>cos</b> | Specify the device to trust CoS | <b>cos-dscp</b> | Specify the device to trust DSCP for IP packets, and trust CoS for non-IP packets. | <b>dscp</b> | Specify the device to trust DSCP | <b>precedence</b> | Specify the device to trust IP Precedence |
| <b>cos</b>        | Specify the device to trust CoS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |            |                                 |                 |                                                                                    |             |                                  |                   |                                           |
| <b>cos-dscp</b>   | Specify the device to trust DSCP for IP packets, and trust CoS for non-IP packets.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |                                 |                 |                                                                                    |             |                                  |                   |                                           |
| <b>dscp</b>       | Specify the device to trust DSCP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |            |                                 |                 |                                                                                    |             |                                  |                   |                                           |
| <b>precedence</b> | Specify the device to trust IP Precedence                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |            |                                 |                 |                                                                                    |             |                                  |                   |                                           |
| <b>Default</b>    | Default QoS trust type is cos.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |            |                                 |                 |                                                                                    |             |                                  |                   |                                           |
| <b>Mode</b>       | Global Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |                                 |                 |                                                                                    |             |                                  |                   |                                           |
| <b>Usage</b>      | <p>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.</p> <p><b>CoS:</b><br/>IEEE 802.1p defined 3bits priority value in vlan tag. Trust this value in packets and assign queue according to cos-queue map.</p> <p><b>DSCP:</b><br/>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.</p> <p><b>IP Precedence:</b><br/>The highest 3bits priority value in IP packet ToS field. Trust this value in packets and assign queue according to precedence-queue map.</p> <p><b>CoS-DSCP:</b><br/>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.</p> |            |                                 |                 |                                                                                    |             |                                  |                   |                                           |
| <b>Example</b>    | <p>This example shows how to change qos basic mode trust types.</p> <pre>Switch(config)# qos trust cos Switch(config)# qos trust cos-dscp Switch(config)# qos trust dscp Switch(config)# qos trust precedence</pre> <p>This example shows how to check current qos trust type.</p> <pre>Switch# show qos QoS Mode: basic Basic trust: ip-precedence</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |            |                                 |                 |                                                                                    |             |                                  |                   |                                           |

## 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

|                  |                                                                                                                                                                                                                                                                                                                 |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>show qos interface</b> <i>IF_PORTS</i>                                                                                                                                                                                                                                                                       |
| <b>Parameter</b> | <i>IF_PORTS</i> Select port to show qos configurations.                                                                                                                                                                                                                                                         |
| <b>Default</b>   | No default value for this command.                                                                                                                                                                                                                                                                              |
| <b>Mode</b>      | Privileged EXEC                                                                                                                                                                                                                                                                                                 |
| <b>Usage</b>     | Use “ <b>show qos interfaces</b> ” command to show port default cos ,remarking state and remarking type state informations.                                                                                                                                                                                     |
| <b>Example</b>   | <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

|                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                  |                        |                   |                         |                         |                             |                       |                        |                   |                         |                         |                                  |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|------------------------|-------------------|-------------------------|-------------------------|-----------------------------|-----------------------|------------------------|-------------------|-------------------------|-------------------------|----------------------------------|
| <b>Syntax</b>           | <b>show qos map</b> [( <b>cos-queue</b>   <b>dscp-queue</b>   <b>precedence-queue</b>   <b>queue-cos</b>   <b>queue-dscp</b>   <b>queue-precedence</b> )]                                                                                                                                                                                                                                                                                                                                       |                  |                        |                   |                         |                         |                             |                       |                        |                   |                         |                         |                                  |
| <b>Parameter</b>        | <table border="1"> <tr> <td><b>cos-queue</b></td> <td>Show CoS to queue map.</td> </tr> <tr> <td><b>dscp-queue</b></td> <td>Show DSCP to queue map.</td> </tr> <tr> <td><b>precedence-queue</b></td> <td>Show IP Precedence to queue</td> </tr> <tr> <td><b>map. queue-cos</b></td> <td>Show queue to CoS map.</td> </tr> <tr> <td><b>queue-dscp</b></td> <td>Show queue to DSCP map.</td> </tr> <tr> <td><b>queue-precedence</b></td> <td>Show queue to IP Precedence map.</td> </tr> </table> | <b>cos-queue</b> | Show CoS to queue map. | <b>dscp-queue</b> | Show DSCP to queue map. | <b>precedence-queue</b> | Show IP Precedence to queue | <b>map. queue-cos</b> | Show queue to CoS map. | <b>queue-dscp</b> | Show queue to DSCP map. | <b>queue-precedence</b> | Show queue to IP Precedence map. |
| <b>cos-queue</b>        | Show CoS to queue map.                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                  |                        |                   |                         |                         |                             |                       |                        |                   |                         |                         |                                  |
| <b>dscp-queue</b>       | Show DSCP to queue map.                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                  |                        |                   |                         |                         |                             |                       |                        |                   |                         |                         |                                  |
| <b>precedence-queue</b> | Show IP Precedence to queue                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                  |                        |                   |                         |                         |                             |                       |                        |                   |                         |                         |                                  |
| <b>map. queue-cos</b>   | Show queue to CoS map.                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                  |                        |                   |                         |                         |                             |                       |                        |                   |                         |                         |                                  |
| <b>queue-dscp</b>       | Show queue to DSCP map.                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                  |                        |                   |                         |                         |                             |                       |                        |                   |                         |                         |                                  |
| <b>queue-precedence</b> | Show queue to IP Precedence map.                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                  |                        |                   |                         |                         |                             |                       |                        |                   |                         |                         |                                  |
| <b>Default</b>          | No default value for this command.                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                  |                        |                   |                         |                         |                             |                       |                        |                   |                         |                         |                                  |
| <b>Mode</b>             | Privileged EXEC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                  |                        |                   |                         |                         |                             |                       |                        |                   |                         |                         |                                  |
| <b>Usage</b>            | Use “ <b>show qos map</b> ” 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.

|                |                                                                                                                                                                                                                                                                                                                                                  |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Example</b> | <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**            **rate-limit egress** <16-1000000>  
**no rate-limit egress**

**Parameter**        <16-1000000>            Specify the committed information rate.

**Default**            Default rate limit is disabled.

**Mode**                Interface configuration

**Usage**                Use the “**rate-limit egress**” command to configure the egress port shaper.

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

You can verify your setting by entering the **show running-config interfaces** command.

**Example**            The following example show how to configure ingress port rate limit and egress port shaper.

```
Switch(config)# interfaces gil
Switch(config-if)# rate-limit egress 2048
Switch# show running-config interfaces gil
interface gil
 rate-limit egress 2048
```

### rate limit egress queue



|                  |                                                                                                                                                                                                                                                                                                          |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>rate-limit egress queue</b> <1-8> <16-1000000><br><b>no rate-limit egress queue</b> <1-8>                                                                                                                                                                                                             |
| <b>Parameter</b> | <1-8> Specify the egress shaper queue number<br><16-1000000> Specify the queue rate.                                                                                                                                                                                                                     |
| <b>Default</b>   | Default queue rate limit is disabled.                                                                                                                                                                                                                                                                    |
| <b>Mode</b>      | Interface configuration                                                                                                                                                                                                                                                                                  |
| <b>Usage</b>     | Use the “ <b>rate-limit egress queue</b> ” command to configure the egress queue shaper.<br><br>Use the <b>no</b> form of this command to disable the queue shaper.<br><br>You can verify your setting by entering the <b>show running-config interfaces</b> command.                                    |
| <b>Example</b>   | The following example show how to configure ingress port rate limit and egress port shaper.<br>Switch(config)# <b>interfaces gil</b><br>Switch(config-if)# <b>rate-limit egress queue 3 2048</b><br>Switch# <b>show running-config interfaces gil</b><br>interface gil<br>rate-limit egress queue 3 2048 |

## rate limit ingress

|                  |                                                                                             |
|------------------|---------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>rate-limit ingress</b> <16-1000000><br><b>no rate-limit ingress</b>                      |
| <b>Parameter</b> | <16-1000000> Specify the ingress limit rate<br><1-8> Specify the egress shaper queue number |
| <b>Default</b>   | Rate limiting is disabled.                                                                  |
| <b>Mode</b>      | Interface configuration                                                                     |
| <b>Usage</b>     | Use the “ <b>rate-limit ingress</b> ” 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**

|                                  |                                                     |
|----------------------------------|-----------------------------------------------------|
| <b>&lt;1-65535&gt;</b>           | Specify event index to create or modify.            |
| <b>[log]</b>                     | (Optional)Specify to show syslog.                   |
| <b>[trap COMMUNITY]</b>          | (Optional)Specify SNMP community to show SNMP trap. |
| <b>[description DESCRIPTION]</b> | (Optional)Specify description of event              |
| <b>[owner NAME]</b>              | (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>

|                  |                                        |                                                                                                                  |
|------------------|----------------------------------------|------------------------------------------------------------------------------------------------------------------|
| <b>Parameter</b> | <b>&lt;1-65535&gt;</b>                 | Specify alarm index to create or modify                                                                          |
|                  | <b>IF_PORT</b>                         | Specify the interface to sample                                                                                  |
|                  | <b>(variable)</b>                      | Specify a mib object to sample                                                                                   |
|                  | <b>&lt;1-2147483647&gt;</b>            | Specify the time in seconds that the alarm monitors the MIB variable.                                            |
|                  | <b>(absolute delta)</b>                | Specify absolute to compare sample counter absolutely.<br>Specify delta to compare delta counter between samples |
|                  | <b>&lt;0-2147483647&gt;</b>            | Specify a number which the alarm trigger rising event                                                            |
|                  | <b>&lt;0-65535&gt;</b>                 | Specify event index when the rising threshold exceeds.                                                           |
|                  | <b>&lt;0-2147483647&gt;</b>            | Specify a number which the alarm trigger falling event                                                           |
|                  | <b>&lt;0-65535&gt;</b>                 | Specify event index when the falling threshold exceeds.                                                          |
|                  | <b>(rising rising-falling falling)</b> | Specify only to how rising or falling startup event. Or show either rising or falling startup event.             |
|                  | <b>[owner NAME]</b>                    | (Optional) Specify owner of alarm.                                                                               |

|                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Default</b> | No default is defined.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Mode</b>    | Global Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Usage</b>   | Use the <b>rmon alarm</b> command to add or modify a RMON alarm entry. Before add alarm entry, at least one event entry must be added. Use the <b>no</b> form of this command to delete. You can verify settings by the <b>show rmon alarm</b> command.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Example</b> | <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)# <b>rmon alarm 1 interface gi1 pkts 300 delta rising 10000 1 falling 100 1 startup rising-falling owner admin</b></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

|                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                        |                                            |                |                                 |                                 |                                                   |                                  |                                                  |                     |                                    |
|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------------------------------------|----------------|---------------------------------|---------------------------------|---------------------------------------------------|----------------------------------|--------------------------------------------------|---------------------|------------------------------------|
| <b>Syntax</b>                    | <pre>rmon history &lt;1-65535&gt; interface IF_PORT [buckets &lt;1-65535&gt;] [interval &lt;1-3600&gt;] [owner NAME] no rmon history &lt;1-65535&gt;</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                        |                                            |                |                                 |                                 |                                                   |                                  |                                                  |                     |                                    |
| <b>Parameter</b>                 | <table border="1"> <tr> <td style="border-top: 1px solid black; border-bottom: 1px solid black;"><b>&lt;1-65535&gt;</b></td> <td>Specify history index to create or modify.</td> </tr> <tr> <td style="border-top: 1px solid black; border-bottom: 1px solid black;"><b>IF_PORT</b></td> <td>Specify the interface to sample</td> </tr> <tr> <td style="border-top: 1px solid black; border-bottom: 1px solid black;"><b>[bucket &lt;1-65535&gt;]</b></td> <td>(Optional) Specify the maximum number of buckets.</td> </tr> <tr> <td style="border-top: 1px solid black; border-bottom: 1px solid black;"><b>[interval &lt;&gt;1-3600]</b></td> <td>(Optional) Specify time interval for each sample</td> </tr> <tr> <td style="border-top: 1px solid black; border-bottom: 1px solid black;"><b>[owner NAME]</b></td> <td>(Optional)Specify owner of history</td> </tr> </table> | <b>&lt;1-65535&gt;</b> | Specify history index to create or modify. | <b>IF_PORT</b> | Specify the interface to sample | <b>[bucket &lt;1-65535&gt;]</b> | (Optional) Specify the maximum number of buckets. | <b>[interval &lt;&gt;1-3600]</b> | (Optional) Specify time interval for each sample | <b>[owner NAME]</b> | (Optional)Specify owner of history |
| <b>&lt;1-65535&gt;</b>           | Specify history index to create or modify.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                        |                                            |                |                                 |                                 |                                                   |                                  |                                                  |                     |                                    |
| <b>IF_PORT</b>                   | Specify the interface to sample                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                        |                                            |                |                                 |                                 |                                                   |                                  |                                                  |                     |                                    |
| <b>[bucket &lt;1-65535&gt;]</b>  | (Optional) Specify the maximum number of buckets.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                        |                                            |                |                                 |                                 |                                                   |                                  |                                                  |                     |                                    |
| <b>[interval &lt;&gt;1-3600]</b> | (Optional) Specify time interval for each sample                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                        |                                            |                |                                 |                                 |                                                   |                                  |                                                  |                     |                                    |
| <b>[owner NAME]</b>              | (Optional)Specify owner of history                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                        |                                            |                |                                 |                                 |                                                   |                                  |                                                  |                     |                                    |

|                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Default</b> | No default is defined.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Mode</b>    | Global Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Usage</b>   | Use the <b>rmon history</b> command to add or modify a RMON history entry.<br>Use the <b>no</b> form of this command to delete.<br>You can verify settings by the <b>show rmon history</b> command.                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Example</b> | <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

|                  |                                                                                                                                                                                                             |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>clear rmon interfaces IF_PORTS statistics</b>                                                                                                                                                            |
| <b>Parameter</b> | <b>IF_PORTS</b> specifies ports to clear                                                                                                                                                                    |
| <b>Default</b>   | No default is defined                                                                                                                                                                                       |
| <b>Mode</b>      | Privileged EXEC                                                                                                                                                                                             |
| <b>Usage</b>     | Use the <b>clear rmon interfaces statistics</b> command to clear RMON etherStat statistics those are recorded on interface.<br>You can verify results by the <b>show rmon interface statistics</b> 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)**

---

|                  |                                                      |
|------------------|------------------------------------------------------|
| <b>Parameter</b> | <b>&lt;1-65535&gt;</b> specifies event index to show |
|                  | <b>all</b> 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

|                  |                                                                                                                                                                                                                                                      |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>show rmon event &lt;1-65535&gt; log</b>                                                                                                                                                                                                           |
| <b>Parameter</b> | <b>&lt;1-65535&gt;</b> specifies event index to show event log                                                                                                                                                                                       |
| <b>Default</b>   | No entry and log is exist                                                                                                                                                                                                                            |
| <b>Mode</b>      | Privileged EXEC                                                                                                                                                                                                                                      |
| <b>Usage</b>     | Use the <b>show rmon event log</b> command to show log triggered by RMON alarm.                                                                                                                                                                      |
| <b>Example</b>   | <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 &lt;= 100</pre> |

## show rmon alarm

|                  |                                                                                           |
|------------------|-------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>show rmon alarm (&lt;1-65535&gt;   all)</b>                                            |
| <b>Parameter</b> | <b>&lt;1-65535&gt;</b> specifies alarm index to show<br><b>all</b> Show all existed alarm |
| <b>Default</b>   | No alarm is defined                                                                       |
| <b>Mode</b>      | Privileged EXEC                                                                           |
| <b>Usage</b>     | Use the <b>show rmon alarm</b> command to show existed RMON alarm entry.                  |



**Example**

The example shows how to show rmon alarm entry.

```
Switch(config)# rmon alarm 1 interface gi1 pkts 300 delta rising 10000 1
falling 100 1 startup rising-falling owner admin
```

```
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
```

## show rmon history

**Syntax**

**show rmon history (<1-65535> | all)**

**Parameter**

|                        |                                 |
|------------------------|---------------------------------|
| <b>&lt;1-65535&gt;</b> | specifies history index to show |
| <b>all</b>             | Show all existed history        |

**Default**

No history is defined

**Mode**

Privileged EXEC

**Usage**

Use the **show rmon history** command to show existed RMON history entry.

**Example**

The example shows how to show RMON history entry.

```
switch(config)# rmon history 1 interface gi1 interval 30 owner admin
switch(config)# show rmon history 1
Rmon History Index 1
Rmon Collection Interface: gi1
Rmon History Bucket 50
Rmon history Interval 30
Rmon History Owner : admin
```

## show rmon history statistic

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>show rmon history &lt;1-65535&gt; statistic</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Parameter</b> | <b>&lt;1-65535&gt;</b> specifies history index to show history statistic                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Default</b>   | No history is defined                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Mode</b>      | Privileged EXEC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Usage</b>     | Use the <b>show rmon history statistic</b> command to show statistics that are recorded by RMON history.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Example</b>   | <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 CRCAlignErrors   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 CRCAlignErrors   0 UnderSizePkts    0 OverSizePkts     0 Fragments        0</pre> |

---

```
Jabbers : 0
Collisions : 0
Utilization : 0
```

---

## 28. SNMP

### show snmp

|                  |                                                                                                                                |
|------------------|--------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>show snmp</b>                                                                                                               |
| <b>Parameter</b> | N/A                                                                                                                            |
| <b>Default</b>   | N/A                                                                                                                            |
| <b>Mode</b>      | Privileged EXEC                                                                                                                |
| <b>Usage</b>     | To show the status of Simple Network Management Protocol (SNMP), use the command <b>show snmp</b> in the Privileged EXEC mode. |
| <b>Example</b>   | The following example shows the SNMP status.<br><br>Switch# show snmp<br>SNMP is disabled.                                     |

### show snmp community

|                  |                                                                                                                        |
|------------------|------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>show snmp community</b>                                                                                             |
| <b>Parameter</b> | N/A                                                                                                                    |
| <b>Default</b>   | N/A                                                                                                                    |
| <b>Mode</b>      | Privileged EXEC                                                                                                        |
| <b>Usage</b>     | To show the configuration of snmp communities, use the command <b>show snmp community</b> in the Privileged EXEC mode. |

|                |                                                                                                                                                                                                                                                 |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Example</b> | <p>The following example shows the SNMP communities configuration.</p> <pre>Switch# show snmp community Community Name      Group Name          View Access ----- private             all ro public              all rw  Total Entries: 2</pre> |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## show snmp engineid

|                  |                                                                                                                             |
|------------------|-----------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>show snmp engineid</b>                                                                                                   |
| <b>Parameter</b> | N/A                                                                                                                         |
| <b>Default</b>   | N/A                                                                                                                         |
| <b>Mode</b>      | Privileged EXEC                                                                                                             |
| <b>Usage</b>     | To show the SNMPv3 engine IDs defined on the switch, use the command <b>show snmp engineid</b> in the Privileged EXEC mode. |

|                |                                                                                                                                                                                                                                                           |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Example</b> | <p>The following example shows the SNMP engineid information.</p> <pre>Switch# show snmp engineid Local SNMPV3 Engine id: 00036d001122        IP address          Remote SNMP engineID ----- 192.168.1.11            00036D10000A  Total Entries: 1</pre> |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## show snmp group

|                  |                        |
|------------------|------------------------|
| <b>Syntax</b>    | <b>show snmp group</b> |
| <b>Parameter</b> | N/A                    |

**Default** N/A

**Mode** Privileged EXEC

**Usage** To show the SNMP group configuration on the switch, use the command **show snmp group** in the Privileged EXEC mode.

**Example** The following example shows the SNMP group configuration.

```
Switch# show snmp group
Group Name Model Level ReadView
WriteView Not

private v2c noauth all
all ---
v3 v3 auth all
all all
```

Total Entries: 2

## show snmp host

**Syntax** **show snmp host**

**Parameter** N/A

**Default** N/A

**Mode** Privileged EXEC

**Usage** To show the SNMP trap notification recipients defined on the switch, use the command **show snmp host** in the Privileged EXEC mode.

**Example** The following example shows the configuration of SNMP notification recipients on the switch.

```
Switch# show snmp host
Server Community Name Notification Version Notification Type

192.168.1.11 private v1 trap

Total Entries: 1
```

## show snmp trap

|                  |                                                                                                                                                                                                                         |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>show snmp trap</b>                                                                                                                                                                                                   |
| <b>Parameter</b> | N/A                                                                                                                                                                                                                     |
| <b>Default</b>   | N/A                                                                                                                                                                                                                     |
| <b>Mode</b>      | Privileged EXEC                                                                                                                                                                                                         |
| <b>Usage</b>     | To show the status of SNMP traps on the switch, use the command <b>show snmp trap</b> in the Privileged EXEC mode.                                                                                                      |
| <b>Example</b>   | <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

|                  |                                                                                                                                                                              |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>show snmp view</b>                                                                                                                                                        |
| <b>Parameter</b> | N/A                                                                                                                                                                          |
| <b>Default</b>   | N/A                                                                                                                                                                          |
| <b>Mode</b>      | Privileged EXEC                                                                                                                                                              |
| <b>Usage</b>     | To show the SNMP view defined on the switch, use the command <b>show snmp view</b> in the Privileged EXEC mode.                                                              |
| <b>Example</b>   | <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

|                  |                                                                                                                                                                                                                                                                                                                                                  |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>show snmp user</b>                                                                                                                                                                                                                                                                                                                            |
| <b>Parameter</b> | N/A                                                                                                                                                                                                                                                                                                                                              |
| <b>Default</b>   | N/A                                                                                                                                                                                                                                                                                                                                              |
| <b>Mode</b>      | Privileged EXEC                                                                                                                                                                                                                                                                                                                                  |
| <b>Usage</b>     | To show the SNMP users defined on the switch, use the command <b>show snmp user</b> in the Privileged EXEC mode.                                                                                                                                                                                                                                 |
| <b>Example</b>   | <p>The following example shows the configuration of SNMP user.</p> <pre> Switch# show snmp user Username:                v3 Password:                ***** Privilege Mode:         rw Access GroupName:       v3 Authentication Protocol: md5 Encryption Protocol:    none Access SecLevel:        auth           </pre> <p>Total Entries: 1</p> |

## snmp

|                  |                             |
|------------------|-----------------------------|
| <b>Syntax</b>    | <b>snmp</b>                 |
| <b>Parameter</b> | N/A                         |
| <b>Default</b>   | SNMP is disabled by default |
| <b>Mode</b>      | 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*

|                  |                                |                                                                                                                     |
|------------------|--------------------------------|---------------------------------------------------------------------------------------------------------------------|
| <b>Parameter</b> | <i>community-name</i>          | The SNMP community name. Its maximum length is 20 characters.                                                       |
|                  | <b>view</b> <i>view-name</i>   | Specify the SNMP view configured by the command <b>snmp view</b> to define the object available to the community.   |
|                  | <b>ro</b>                      | Read only access (default)                                                                                          |
|                  | <b>rw</b>                      | Writable access                                                                                                     |
|                  | <b>group</b> <i>group-name</i> | Specify the SNMP group configured by the command <b>snmp group</b> 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*)



|                  |                 |                                                                                                                                |
|------------------|-----------------|--------------------------------------------------------------------------------------------------------------------------------|
| <b>Parameter</b> | <b>default</b>  | 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*)

|                  |                  |                                                                                                                              |
|------------------|------------------|------------------------------------------------------------------------------------------------------------------------------|
| <b>Parameter</b> | <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)**

|                  |                                |                                                                                                                                                         |
|------------------|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Parameter</b> | <i>group-name</i>              | Specify SNMP group name, and the maximum length is 30 characters.                                                                                       |
|                  | <b>(1 2c 3)</b>                | Specify the SNMP version.                                                                                                                               |
|                  | <b>noauth</b>                  | Specify that no packet authentication is performed.                                                                                                     |
|                  | <b>auth</b>                    | Specify that no packet authentication without encryption is performed. It is applicable only to the SNMPv3 security mode.                               |
|                  | <b>priv</b>                    | Specify that no packet authentication with encryption is performed. It is applicable only to the SNMPv3 security mode.                                  |
|                  | <b>read-view read-view</b>     | Set the view name that enables configuring the agent, and its maximum length is 30 characters.                                                          |
|                  | <b>write-view write-view</b>   | Set the view name that enables viewing only, and its maximum length is 30 characters.                                                                   |
|                  | <b>notify-view notify-view</b> | Sets the view name that sends only traps with contents that is included in SNMP view selected for notification.<br>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.                                                                                               |
| <b>traps</b>                    | Send SNMP traps to the host. It is the default action.                                                                    |
| <b>informs</b>                  | Send SNMP informs to the host.                                                                                            |
| <b>version (1 2c 3)</b>         | Specify the SNMP version.                                                                                                 |
| <b>noauth</b>                   | Specify that no packet authentication is performed. It is applicable only to the SNMPv3 security mode.                    |
| <b>auth</b>                     | Specify that no packet authentication without encryption is performed. It is applicable only to the SNMPv3 security mode. |
| <b>priv</b>                     | 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.                                                                            |
| <b>udp-port</b> <i>udp-port</i> | Specify the UDP port number.                                                                                              |
| <b>timeout</b> <i>timeout</i>   | Specify the SNMP informs timeout                                                                                          |
| <b>retries</b> <i>retries</i>   | 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**)

|                   |                                                |
|-------------------|------------------------------------------------|
| <b>auth</b>       | Enable the SNMP authentication failure trap.   |
| <b>cold-start</b> | Enable the SNMP cold start-up failure trap.    |
| <b>linkUpDown</b> | Enable the SNMP link up and down failure trap. |

|                      |                                             |
|----------------------|---------------------------------------------|
| <b>port-security</b> | Enable the SNMP port security trap.         |
| <b>warm-start</b>    | 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 <b>snmp host</b> . |
| <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 <b>snmp group</b> .                                                                          |
| <b>auth (md5)</b>             | Specify the HMAC-MD5-96 authentication protocol as the user authentication.                                                                                                                                       |
| <b>auth (sha)</b>             | 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.                                                                                                                               |
| <b>Priv</b> <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.                                                                                                                                               |
| <b>subtree</b> <i>oid-tree</i>     | Specify the ASN.1 subtree object identifier (OID) to be included or excluded from the SNMP view.                                                                                                       |
| <b>oid-mask</b> (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. |
| <b>iewtype</b> (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)

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>instance</b> <i>instance-id</i> <b>vlan</b> <i>vlan-list</i><br><b>no instance</b> <i>instance-id</i> <b>vlan</b> <i>vlan-list</i>                                                                                                                                                                                                                                                                                                                         |
| <b>Parameter</b> | <i>instance-id</i> The MSTP instance ID from 0 to 15.<br><b>vlan</b> <i>vlan-list</i> Add the VLAN list to the MSTP instance.                                                                                                                                                                                                                                                                                                                                 |
| <b>Default</b>   | All VLANs are mapped to the Common and Internal Spanning Tree (CIST) instance (instance 0).                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Mode</b>      | MST Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Usage</b>     | 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.<br><br>All VLANs that are not explicitly configured to an MSTP instance are mapped to the CIST instance (instance 0).<br><br>For two or more switches in the same MSTP region, their VLAN mapping, name and revision number configuration, must be the same. |
| <b>Example</b>   | The following example maps the vlan 10-20 to the MSTP instance 1, and VLAN 100 to instance 2.<br><br>Switch(config)# spanning-tree mst configuration<br>Switch(config-mst)# instance 1 vlan 10-20<br>Switch(config-mst)# instance 2 vlan 100                                                                                                                                                                                                                  |

### name (MST)

|                  |                                                                              |
|------------------|------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>name</b> <i>name-str</i><br><b>no name</b>                                |
| <b>Parameter</b> | <i>name-str</i> The MSTP instance name. Its maximum length is 32 characters. |
| <b>Default</b>   | The default MSTP name is the switch MAC address.                             |
| <b>Mode</b>      | 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 *Valkyrie*.

```
Switch(config)# spanning-tree mst configuration
Switch(config-mst)# name Valkyrie
```

## revision (MST)

**Syntax** **revision** *rev*  
**no revision**

**Parameter** *rev* The MSTP revision number. Its valid range is from 0 to 65535.

**Default** The default revision number is 0.

**Mode** MST Configuration

**Usage** To define the revision for the MSTP configuration, use the command **revision** in the MST Configuration mode; and use the **no** form of the command to restore its default configuration.

**Example** The following example defines the revision MSTP configuration to 1.

```
Switch(config)# spanning-tree mst configuration
Switch(config-mst)# revision 1
```

## 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]`

|                  |                  |                                               |
|------------------|------------------|-----------------------------------------------|
| <b>Parameter</b> | <b>interface</b> | An interface ID or the list of interface IDs. |
|                  | <i>IF_PORTS</i>  |                                               |
|                  | <b>statistic</b> | 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***

|                  |                    |                                                        |
|------------------|--------------------|--------------------------------------------------------|
| <b>Parameter</b> | <i>instance-id</i> | The MSTP instance ID. Its valid range is from 0 to 15. |
| <b>interface</b> | <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

|                  |                                                 |
|------------------|-------------------------------------------------|
| <b>Syntax</b>    | <b>spanning-tree</b><br><b>no spanning-tree</b> |
| <b>Parameter</b> | N/A                                             |
| <b>Default</b>   | Spanning-Tree is enabled by default.            |
| <b>Mode</b>      | 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

|                  |                                                                                                                                                                                                                                                                   |                  |                                       |                 |                                          |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------------------------------------|-----------------|------------------------------------------|
| <b>Syntax</b>    | <b>spanning-tree bpdu (filtering flooding)</b><br><b>no spanning-tree bpdu</b>                                                                                                                                                                                    |                  |                                       |                 |                                          |
| <b>Parameter</b> | <table border="1"> <tr> <td><b>filtering</b></td> <td>Filter the BPDU when STP is disabled.</td> </tr> <tr> <td><b>flooding</b></td> <td>Flood the BPDU when the STP is disabled.</td> </tr> </table>                                                             | <b>filtering</b> | Filter the BPDU when STP is disabled. | <b>flooding</b> | Flood the BPDU when the STP is disabled. |
| <b>filtering</b> | Filter the BPDU when STP is disabled.                                                                                                                                                                                                                             |                  |                                       |                 |                                          |
| <b>flooding</b>  | Flood the BPDU when the STP is disabled.                                                                                                                                                                                                                          |                  |                                       |                 |                                          |
| <b>Default</b>   | The default configuration is flooding.                                                                                                                                                                                                                            |                  |                                       |                 |                                          |
| <b>Mode</b>      | Global Configuration                                                                                                                                                                                                                                              |                  |                                       |                 |                                          |
| <b>Usage</b>     | To configure the action of Bridge Protocol Data Unit (BPDU) handling when STP is disabled, use the command <b>spanning-tree bpdu</b> in the Global Configuration mode. To restore the configuration to the default action, use the <b>no</b> form of the command. |                  |                                       |                 |                                          |
| <b>Example</b>   | <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

|                  |                                                                                                                                                                                    |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>spanning-tree bpdu-filter</b><br><b>no spanning-tree bpdu-filter</b>                                                                                                            |
| <b>Parameter</b> | N/A                                                                                                                                                                                |
| <b>Default</b>   | BPDU filter is disabled.                                                                                                                                                           |
| <b>Mode</b>      | Interface Configuration                                                                                                                                                            |
| <b>Usage</b>     | To enable the BPDU filter, use the command <b>spanning-tree bpdu-filter</b> in the Interface Configuration mode; and use <b>no</b> 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   |

|                |                                                                                                                                                                                                                       |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Mode</b>    | Interface Configuration                                                                                                                                                                                               |
| <b>Usage</b>   | To configure the STP path cost for an interface, use the command <b>spanning-tree cost</b> in the Interface Configuration mode; and use the <b>no</b> form of the command to restore it to the default configuration. |
| <b>Example</b> | The following example configures port path cost to 30000 for interface fa2.<br><br><pre>Switch(config)# interface gil Switch(config-if)# spanning-tree cost 30000</pre>                                               |

## spanning-tree forward-time

|                  |                                                                                          |
|------------------|------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>spanning-tree forward-time</b> <i>seconds</i><br><b>no spanning-tree forward-time</b> |
| <b>Parameter</b> | <i>seconds</i> STP forward delay time. Its valid range is from 4 to 10 seconds.          |

|                |                                               |
|----------------|-----------------------------------------------|
| <b>Default</b> | The default forward delay time is 15 seconds. |
|----------------|-----------------------------------------------|

|             |                      |
|-------------|----------------------|
| <b>Mode</b> | Global Configuration |
|-------------|----------------------|

|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Usage</b> | 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 <b>spanning-tree forward-time</b> in the Global Configuration mode. To restore it to the default configuration, use the <b>no</b> form of the command.<br><br>When the forward delay time is configured, the following relationship should be maintained:<br><br>$2 * (\text{forward-time} - 1) \geq \text{Max-Age}$ |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                |                                                                                                                                |
|----------------|--------------------------------------------------------------------------------------------------------------------------------|
| <b>Example</b> | The following example configures STP forward delay time to 25.<br><br><pre>Switch(config)# spanning-tree forward-time 25</pre> |
|----------------|--------------------------------------------------------------------------------------------------------------------------------|

## spanning-tree hello-time

|                  |                                                                                      |
|------------------|--------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>spanning-tree hello-time</b> <i>seconds</i><br><b>no spanning-tree hello-time</b> |
| <b>Parameter</b> | <i>seconds</i> 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

|                       |                                                                                                                                                                                                               |                       |                                               |               |                                       |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------------------------------|---------------|---------------------------------------|
| <b>Syntax</b>         | <b>spanning-tree link-type (point-to-point shared)</b><br><b>no spanning-tree link-type</b>                                                                                                                   |                       |                                               |               |                                       |
| <b>Parameter</b>      | <table border="1"> <tr> <td><b>point-to-point</b></td> <td>Specify the port link type is point to point.</td> </tr> <tr> <td><b>shared</b></td> <td>Specify the port link type is shared.</td> </tr> </table> | <b>point-to-point</b> | Specify the port link type is point to point. | <b>shared</b> | Specify the port link type is shared. |
| <b>point-to-point</b> | Specify the port link type is point to point.                                                                                                                                                                 |                       |                                               |               |                                       |
| <b>shared</b>         | Specify the port link type is shared.                                                                                                                                                                         |                       |                                               |               |                                       |
| <b>Default</b>        | The default configuration link type is <b>point-to-point</b> for the ports with full duplex configuration, and <b>shared</b> for the ports with half duplex settings.                                         |                       |                                               |               |                                       |
| <b>Mode</b>           | Interface Configuration                                                                                                                                                                                       |                       |                                               |               |                                       |
| <b>Usage</b>          | To set the RSTP link-type for an interface, use the command <b>spanning-tree link</b> in the Interface Configuration mode. For the default configuration, use the <b>no</b> form of the command.              |                       |                                               |               |                                       |
| <b>Example</b>        | <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

|                  |                                                                                                                                                                                                                                                     |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>spanning-tree max-hops <i>counts</i></b><br><b>no spanning-tree max-hops</b>                                                                                                                                                                     |
| <b>Parameter</b> | <i>counts</i> Specify the number of hops in an MSTP region before the BPDU is discarded. The valid range is 1 to 40.                                                                                                                                |
| <b>Default</b>   | The default max-hops configuration is 20.                                                                                                                                                                                                           |
| <b>Mode</b>      | Global Configuration                                                                                                                                                                                                                                |
| <b>Usage</b>     | To specify the number of hops for a BPDU to be forwarded in the MSTP region, use the command <b>spanning-tree max-hops</b> in the Global Configuration mode; and restore the setting to default configuration by the <b>no</b> form of the command. |

---

|                |                                                                                                                            |
|----------------|----------------------------------------------------------------------------------------------------------------------------|
| <b>Example</b> | The following example specifies the max hops for BPDU to 10.<br><br><code>Switch(config)# spanning-tree max-hops 10</code> |
|----------------|----------------------------------------------------------------------------------------------------------------------------|

---

## spanning-tree maximum-age

---

|               |                                                                                        |
|---------------|----------------------------------------------------------------------------------------|
| <b>Syntax</b> | <b>spanning-tree maximum-age</b> <i>seconds</i><br><b>no spanning-tree maximum-age</b> |
|---------------|----------------------------------------------------------------------------------------|

---

|                  |                |                                                                                                                                |
|------------------|----------------|--------------------------------------------------------------------------------------------------------------------------------|
| <b>Parameter</b> | <i>seconds</i> | The interval in seconds for a switch to wait the configuration messages, without attempting to redefine its own configuration. |
|------------------|----------------|--------------------------------------------------------------------------------------------------------------------------------|

---

|                |                                        |
|----------------|----------------------------------------|
| <b>Default</b> | The default maximum age is 20 seconds. |
|----------------|----------------------------------------|

---

|             |                      |
|-------------|----------------------|
| <b>Mode</b> | Global Configuration |
|-------------|----------------------|

---

|              |                                                                                                                                                                                                                                                                                                                     |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Usage</b> | 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 <b>spanning-tree maximum-age</b> in the Global Configuratio mode. For the default configuration, use the <b>no</b> form of the commands. |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

When the maximum age is configured, the following relationship should be maintained:

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

---

|                |                                                                                                                          |
|----------------|--------------------------------------------------------------------------------------------------------------------------|
| <b>Example</b> | The following example configures STP maximum age to 10.<br><br><code>Switch(config)# spanning-tree maximum-age 10</code> |
|----------------|--------------------------------------------------------------------------------------------------------------------------|

---

## spanning-tree mcheck

---

|               |                             |
|---------------|-----------------------------|
| <b>Syntax</b> | <b>spanning-tree mechek</b> |
|---------------|-----------------------------|

---

|                  |     |
|------------------|-----|
| <b>Parameter</b> | N/A |
|------------------|-----|

---

|                |     |
|----------------|-----|
| <b>Default</b> | N/A |
|----------------|-----|

---

|             |                         |
|-------------|-------------------------|
| <b>Mode</b> | 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`

|                  |             |                                                     |
|------------------|-------------|-----------------------------------------------------|
| <b>Parameter</b> | <b>mstp</b> | Enable the Multiple Spanning Tree (MSTP) operation. |
|                  | <b>rstp</b> | Enable the Rapid Spanning Tree (RSTP) operation.    |
|                  | <b>stp</b>  | 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          | Description                                                                                                                                                                                                                                                                                                                          |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <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 nsures the probility that the switch is selected as the root bridge, and the lower values has the higher priority for the switch to be selected as the root bridge.

**Default** The default priority on each instance is 32768.

**Mode** Global Configuration

**Usage** To configure the bridge priority on the specific instance, use the command **spanning-tree mst priority** in the Global Configuration mode. To restore the default configuration, use the **no** form of the command.

The value of bridge priority must be the multiple of 4096. A switch with the lowest priority is the root of the STP topology. For the configuration of bridge priority on the CIST (instance 0), it is equal to the command **spanning-tree priority** in the Global Configuration mode.

**Example** The following example modifies the bridge priority to 4096 on instance 0 and instance 1 individually.

```
Switch(config)# spanning-tree mst 0 priority 4096
Switch(config)# spanning-tree mst 1 priority 4096
```

## spanning-tree pathcost method

**Syntax** **spanning-tree pathcost method (long|short)**

|                  |              |                                                     |
|------------------|--------------|-----------------------------------------------------|
| <b>Parameter</b> | <b>long</b>  | The range for the path cost is from 1 to 200000000. |
|                  | <b>short</b> | 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.

---

|                |                                                                                                                                 |
|----------------|---------------------------------------------------------------------------------------------------------------------------------|
| <b>Example</b> | The following example modifies path cost method to short.<br><br><pre>Switch(config)# spanning-tree pathcost method short</pre> |
|----------------|---------------------------------------------------------------------------------------------------------------------------------|

## spanning-tree port-priority

|                  |                                                                                                             |
|------------------|-------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>spanning-tree port-priority</b> <i>priority</i><br><b>no spanning-tree port-priority</b> <i>priority</i> |
| <b>Parameter</b> | <i>priority</i> Specify the priority for an interface. The valid range is from 0 to 240.                    |

|                |                                                 |
|----------------|-------------------------------------------------|
| <b>Default</b> | The default priority for each interface is 128. |
|----------------|-------------------------------------------------|

|             |                         |
|-------------|-------------------------|
| <b>Mode</b> | Interface Configuration |
|-------------|-------------------------|

|              |                                                                                                                                                                                                                                                                      |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Usage</b> | To configure the STP priority for an interface, use the command <b>spanning- tree port-priority</b> in the Interface Configuration mode. For the default configuration, use the <b>no</b> form of the command.<br><br>The priority value must be the multiple of 16. |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                |                                                                                                                                                                                  |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Example</b> | The following example modifies the port priority to 96 for the interface gi2 .<br><br><pre>Switch(config)# interface gi2 Switch(config-if)# spanning-tree port-priority 96</pre> |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## spanning-tree priority

|                  |                                                                                                                                                                                                                                                                                                                                                                     |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>spanning-tree priority</b> <i>priority</i><br><b>no spanning-tree priority</b>                                                                                                                                                                                                                                                                                   |
| <b>Parameter</b> | <i>instance-id</i> Specify the instance ID. The valid range is from 0 to 15.<br><br><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. |

|                |                                            |
|----------------|--------------------------------------------|
| <b>Default</b> | The default priority for the switch 32768. |
|----------------|--------------------------------------------|

|                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Mode</b>    | Global Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Usage</b>   | <p>To configure the bridge priority, use the command <b>spanning-tree mst priority</b> in the Global Configuration mode. To restore the default configuration, use the <b>no</b> form of the command.</p> <p>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.</p> |
| <b>Example</b> | <p>The following example modifies the bridge priority to 4096.</p> <pre>Switch(config)# spanning-tree priority 4096</pre>                                                                                                                                                                                                                                                                                                                                                                      |

## spanning-tree tx-hold-count

|                  |                                                                                                                                                                                                                             |                                                                                                                                  |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>spanning-tree tx-hold-count</b> <i>count</i><br><b>no spanning-tree tx-hold-count</b>                                                                                                                                    |                                                                                                                                  |
| <b>Parameter</b> | <i>count</i>                                                                                                                                                                                                                | Specify the tx-hold-count used to limit the maximum numbers of packets transmission per second. The valid range is from 1 to 10. |
| <b>Default</b>   | The default value is 6.                                                                                                                                                                                                     |                                                                                                                                  |
| <b>Mode</b>      | Global Configuration                                                                                                                                                                                                        |                                                                                                                                  |
| <b>Usage</b>     | To limit the maximum numbers of packets transmission per second, use the command <b>spanning-tree tx-hold-count</b> in the Global Configuration mode. For the default configuration, use the <b>no</b> form of the command. |                                                                                                                                  |
| <b>Example</b>   | <p>The following example sets the tx-hold-count to 4.</p> <pre>Switch(config)# spanning-tree tx-hold-count 4</pre>                                                                                                          |                                                                                                                                  |

## 30. Storm Control

### show storm-control

|               |                           |
|---------------|---------------------------|
| <b>Syntax</b> | <b>show storm-control</b> |
|---------------|---------------------------|

**show storm-control interface** *IF\_PORTS*

|                  |                                       |
|------------------|---------------------------------------|
| <b>Parameter</b> | <i>IF_PORTS</i> Specify port to show. |
|------------------|---------------------------------------|

|                |                                   |
|----------------|-----------------------------------|
| <b>Default</b> | No default value for this command |
|----------------|-----------------------------------|

|             |                 |
|-------------|-----------------|
| <b>Mode</b> | Privileged EXEC |
|-------------|-----------------|

|              |                                                                                                                                                                                                                                                                          |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Usage</b> | <p>Use “<b>show storm-control</b>” command to show all storm control related configurations including global configuration and per port configurations.</p> <p>Use “<b>show storm-control interface</b>” command to show selected port storm control configurations.</p> |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                |                                                                           |
|----------------|---------------------------------------------------------------------------|
| <b>Example</b> | <p>This example shows how to show storm control global configuration.</p> |
|----------------|---------------------------------------------------------------------------|

```
Switch# show storm-control
Storm control preamble and IFG: Excluded
Storm control unit: pps
.....
```

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
-----+-----+-----+-----+-----+-----
fal enable 200 Off(10000) Off(10000)
Shutdown
```

## storm-control

|               |                                                         |
|---------------|---------------------------------------------------------|
| <b>Syntax</b> | <p><b>storm-control</b><br/><b>no storm-control</b></p> |
|---------------|---------------------------------------------------------|

**storm-control (broadcast | unknown-unicast | unknown-multicast)**  
**no storm-control (broadcast | unknown-unicast | unknown-multicast)**

|                  |                                                                      |
|------------------|----------------------------------------------------------------------|
| <b>Parameter</b> | <b>broadcast</b> Select broadcast storm control type                 |
|                  | <b>unknown-unicast</b> Select unknown unicast storm control type     |
|                  | <b>unknown-multicast</b> Select unknown multicast storm control type |

|                |                                                                                            |
|----------------|--------------------------------------------------------------------------------------------|
| <b>Default</b> | <p>Default storm control is disabled.<br/>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.

|                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Mode</b>    | Interface Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Usage</b>   | Use “ <b>storm-control action</b> ” command to set the action when the received storm control packets exceed the maximum rate on an interface. Use <b>no</b> form to restore to default action.                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Example</b> | <p>This example shows how to configure storm control action to shutdown port on interface gil.</p> <pre>Switch(config)# interface gil Switch(config-if)# storm-control action shutdown</pre> <p>This example shows how to show storm control action on interface gil.</p> <pre>Switch# show storm-control interfaces gil   Port        State   Broadcast   Unkown-Multicast   Unknown-Unicast   Action                               pps                                     pps                 pps -----+-----+-----+-----+-----+-----+----- ---   gil      disable Off( 10000)      Off( 10000)      Off( 10000) Shutdown</pre> |

## storm-control ifg

|                  |                                                                                                                                                                                                                                                                                            |                |                                                                          |                |                                                                         |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|--------------------------------------------------------------------------|----------------|-------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>storm-control ifg (include   exclude)</b>                                                                                                                                                                                                                                               |                |                                                                          |                |                                                                         |
| <b>Parameter</b> | <table border="1"> <tr> <td><b>include</b></td> <td>Include preamble &amp; IFG (20 bytes) when count ingress storm control rate.</td> </tr> <tr> <td><b>exclude</b></td> <td>Exclude preamble &amp; IFG (20 bytes) when count ingress storm control rate</td> </tr> </table>               | <b>include</b> | Include preamble & IFG (20 bytes) when count ingress storm control rate. | <b>exclude</b> | Exclude preamble & IFG (20 bytes) when count ingress storm control rate |
| <b>include</b>   | Include preamble & IFG (20 bytes) when count ingress storm control rate.                                                                                                                                                                                                                   |                |                                                                          |                |                                                                         |
| <b>exclude</b>   | Exclude preamble & IFG (20 bytes) when count ingress storm control rate                                                                                                                                                                                                                    |                |                                                                          |                |                                                                         |
| <b>Default</b>   | Default storm control inter frame gap is excluded.                                                                                                                                                                                                                                         |                |                                                                          |                |                                                                         |
| <b>Mode</b>      | Global Configuration                                                                                                                                                                                                                                                                       |                |                                                                          |                |                                                                         |
| <b>Usage</b>     | Storm control mechanism will try to calculate ingress packets is exceed configured rate or not and do corresponding action.<br>Use <b>storm-control ifg</b> command to include/exclude the preamble and inter frame gap into the calculating.                                              |                |                                                                          |                |                                                                         |
| <b>Example</b>   | <p>This example shows how to configure storm inter frame gap to include.</p> <pre>Switch(config)# storm-control ifg include</pre> <p>This example shows how to show storm control global configuration.</p> <pre>Switch# show storm-control Storm control preamble and IFG: Included</pre> |                |                                                                          |                |                                                                         |





## storm-control unit

|                  |                                                                                                                                                                                                                                                                                                                     |            |                                              |            |                                               |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|----------------------------------------------|------------|-----------------------------------------------|
| <b>Syntax</b>    | <b>storm-control unit (bps   pps)</b>                                                                                                                                                                                                                                                                               |            |                                              |            |                                               |
| <b>Parameter</b> | <table border="1"> <tr> <td><b>bps</b></td> <td>Storm control rate calculates by octet-based</td> </tr> <tr> <td><b>pps</b></td> <td>Storm control rate calculates by packet-based</td> </tr> </table>                                                                                                              | <b>bps</b> | Storm control rate calculates by octet-based | <b>pps</b> | Storm control rate calculates by packet-based |
| <b>bps</b>       | Storm control rate calculates by octet-based                                                                                                                                                                                                                                                                        |            |                                              |            |                                               |
| <b>pps</b>       | Storm control rate calculates by packet-based                                                                                                                                                                                                                                                                       |            |                                              |            |                                               |
| <b>Default</b>   | Default storm control unit is bps.                                                                                                                                                                                                                                                                                  |            |                                              |            |                                               |
| <b>Mode</b>      | Global Configuration                                                                                                                                                                                                                                                                                                |            |                                              |            |                                               |
| <b>Usage</b>     | <p>Storm control mechanism will try to calculate ingress packets is exceed configured rate or not and do corresponding action.</p> <p>Use <b>storm-control unit</b> command to change the unit of calculating method.</p>                                                                                           |            |                                              |            |                                               |
| <b>Example</b>   | <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

|                  |                                                                                                                                                                                       |               |                                   |               |                                   |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-----------------------------------|---------------|-----------------------------------|
| <b>Syntax</b>    | <b>boot system (image0   image1)</b>                                                                                                                                                  |               |                                   |               |                                   |
| <b>Parameter</b> | <table border="1"> <tr> <td><b>image0</b></td> <td>Boot from flash image partition 0</td> </tr> <tr> <td><b>image1</b></td> <td>Boot from flash image partition 1</td> </tr> </table> | <b>image0</b> | Boot from flash image partition 0 | <b>image1</b> | Boot from flash image partition 1 |
| <b>image0</b>    | Boot from flash image partition 0                                                                                                                                                     |               |                                   |               |                                   |
| <b>image1</b>    | Boot from flash image partition 1                                                                                                                                                     |               |                                   |               |                                   |
| <b>Default</b>   | Default boot image is image0.                                                                                                                                                         |               |                                   |               |                                   |
| <b>Mode</b>      | 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**

|                       |                                                                                                                                                                                                                                                    |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>flash://</b>       | Specify the file stored in flash to operation. Available files are:<br>flash://startup-config<br>flash://backup-config<br>flash://rsa1<br>flash://rsa2<br>flash://dsa2<br>flash://image0<br>flash://image1<br>flash://ram.log<br>flash://flash.log |
| <b>tftp://</b>        | Specify remote tftp server and remote file name. The format is “ <b>tftp://192.168.1.111/remote_file_name</b> ”                                                                                                                                    |
| <b>running-config</b> | Running configuration file                                                                                                                                                                                                                         |
| <b>startup-config</b> | Startup configuration file                                                                                                                                                                                                                         |
| <b>backup-config</b>  | 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)`

|                  |                       |                                                                                                                                   |
|------------------|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| <b>Parameter</b> | <b>flash://</b>       | Specify the configuration file stored in flash to delete. Available files are:<br>flash://startup-config<br>flash://backup-config |
|                  | <b>startup-config</b> | Delete startup configuration file                                                                                                 |

|                      |                                  |
|----------------------|----------------------------------|
| <b>backup-config</b> | Delete backup configuration file |
| <b>image0</b>        | Delete flash image0.             |
| <b>image1</b>        | 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

|                       |                                          |
|-----------------------|------------------------------------------|
| <b>running-config</b> | Show running configuration on terminal   |
| <b>startup-config</b> | Show startup configuration on terminal   |
| <b>backup-config</b>  | Show backup configuration on terminal    |
| <b>IF_PORTS</b>       | 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.



|                |                                                                                               |           |                     |
|----------------|-----------------------------------------------------------------------------------------------|-----------|---------------------|
| <b>Example</b> | This example shows how to show all files status stored in flash.<br>Switch# <b>show flash</b> |           |                     |
|                | 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)

|                  |                                                                                                                                                                                                                                                                                                                                                                 |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>surveillance-vlan</b><br><b>no surveillance -vlan</b>                                                                                                                                                                                                                                                                                                        |
| <b>Parameter</b> |                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Default</b>   | Surveillance VLAN is disabled                                                                                                                                                                                                                                                                                                                                   |
| <b>Mode</b>      | Global Configuration                                                                                                                                                                                                                                                                                                                                            |
| <b>Usage</b>     | Use the <b>surveillance vlan</b> global configuration command to enable the functional Surveillance VLAN on the device.<br>Use the <b>no</b> form of this command to disable Surveillance VLAN function. You can verify your setting by entering the <b>show surveillance vlan Privileged EXEC</b> command.                                                     |
| <b>Example</b>   | The following example shows how to enable Surveillance VLAN.<br>Switch(config)# <b>surveillance -vlan</b><br>Switch# <b>show surveillance -vlan</b><br>Administrate Surveillance VLAN state : disabled<br>Surveillance VLAN ID : none (disable)<br>Surveillance VLAN Aging : 1440 minutes<br>Surveillance VLAN CoS : 6<br>Surveillance VLAN 1p Remark: disabled |

### surveillance-vlan (Interface)

|                  |                                                         |
|------------------|---------------------------------------------------------|
| <b>Syntax</b>    | <b>surveillance-vlan</b><br><b>no surveillance-vlan</b> |
| <b>Parameter</b> | N/A                                                     |

|                |                                                                                                                                                                                                                                                                                                                                            |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Default</b> | Disable by default.                                                                                                                                                                                                                                                                                                                        |
| <b>Mode</b>    | Interface Configuration                                                                                                                                                                                                                                                                                                                    |
| <b>Usage</b>   | <p>Use the <b>surveillance vlan</b> Interface configuration command to enable OUI surveillance VLAN configuration on an interface</p> <p>Use the <b>no</b> form of this command to disable Surveillance VLAN on an interfaces</p> <p>You can verify your setting by entering the <b>show surveillance vlan Privileged EXEC</b> 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

|                  |                                                                                  |
|------------------|----------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>surveillance-vlan vlan &lt;1-4094&gt;</b><br><b>no surveillance-vlan vlan</b> |
| <b>Parameter</b> | <1-4094> Specify the Surveillance VLAN ID                                        |
| <b>Default</b>   | The default Surveillance VLAN ID is None.                                        |

|                |                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Mode</b>    | Global Configuration                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Usage</b>   | Use the <b>surveillance vlan id</b> global configuration command to configure the VLAN identifier of the surveillance VLAN statically.<br>Use the <b>no</b> form of this command to restore surveillance VLAN id to default. You can verify your setting by entering the <b>show surveillance vlan Privileged EXEC</b> command                                                            |
| <b>Example</b> | The following example shows how to set Surveillance VLAN id. The VLAN id must be created first.<br>Switch(config)# <b>surveillance-vlan vlan 128</b><br>Switch# <b>show surveillance-vlan</b><br>Administrate Surveillance VLAN state : enabled<br>Surveillance VLAN ID 128<br>Surveillance VLAN Aging : 1440 minutes<br>Surveillance VLAN CoS 6<br>Surveillance VLAN 1p Remark: disabled |

## surveillance-vlan oui-table

|                  |                                                                                                                                                                                                                                                                                                         |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>surveillance-vlan oui-table</b> A:B:C [DESCRIPTION]<br><b>no surveillance-vlan oui-table</b> [A:B:C]                                                                                                                                                                                                 |
| <b>Parameter</b> | A:B:C Specify OUI Mac address to add or remove<br>DESCRIPTION Specify description of the specified MAC address to the surveillance VLAN OUI table                                                                                                                                                       |
| <b>Default</b>   | Default has no pre-defined OUI.                                                                                                                                                                                                                                                                         |
| <b>Mode</b>      | Global Configuration                                                                                                                                                                                                                                                                                    |
| <b>Usage</b>     | Use the <b>surveillance vlan oui-table</b> global configuration command to add OUI mac address to OUI Table<br>Use the <b>no</b> form of this command to remove all or specified OUI mac address..<br>You can verify your setting by entering the <b>show surveillance vlan Privileged EXEC</b> command |
| <b>Example</b>   | This following example shows how to add OUI Mac.<br>Switch(config)# <b>surveillance-vlan oui-table 00:01:02 "Test"</b><br>Switch# <b>show surveillance-vlan interfaces fa1-3</b><br>Surveillance VLAN Aging : 1440 minutes<br>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)**

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |                                                                                    |     |                                                                                             |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>surveillance-vlan cos ( src   all )</b><br><b>no surveillance-vlan cos</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |                                                                                    |     |                                                                                             |
| <b>Parameter</b> | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">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 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |                                                                                    |     |                                                                                             |
| <b>Default</b>   | The default all port in Src mode.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |                                                                                    |     |                                                                                             |
| <b>Mode</b>      | Interface configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |     |                                                                                    |     |                                                                                             |
| <b>Usage</b>     | Use the <b>surveillance vlan cos mode</b> Interface configuration command to configure OUI surveillance VLAN cos mode configuration on an interface. Use the “ <b>no</b> ” form to restore to default mode. You can verify your setting by entering the <b>show surveillance-vlan interfaces Privileged EXEC</b> command                                                                                                                                                                                                                                                                                                    |     |                                                                                    |     |                                                                                             |
| <b>Example</b>   | <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> <p>Port     State   Port Mode   Cos Mode</p> <pre>-----+-----+-----+----- fa1     Disabled   Auto     All fa2     Disabled   Auto     All fa3     Disabled   Auto     All</pre> |     |                                                                                    |     |                                                                                             |

### surveillance-vlan mode

|               |                                                                                           |
|---------------|-------------------------------------------------------------------------------------------|
| <b>Syntax</b> | <b>surveillance-vlan mode</b><br><b>(auto manual) no</b><br><b>surveillance-vlan mode</b> |
|---------------|-------------------------------------------------------------------------------------------|

---

|                  |             |                                                              |
|------------------|-------------|--------------------------------------------------------------|
| <b>Parameter</b> | <b>auto</b> | 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



|                |                                                                                                                                                                                                                                                                                           |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Default</b> | The default aging-timeout value is 1440 minutes                                                                                                                                                                                                                                           |
| <b>Mode</b>    | Global Configuration                                                                                                                                                                                                                                                                      |
| <b>Usage</b>   | Use the <b>surveillance vlan aging-time</b> global configuration command to configure the surveillance VLAN aging timeout.<br>Use the “ <b>no</b> ” form to restore to default time.<br>You can verify your setting by entering the <b>show surveillance vlan Privileged EXEC</b> command |

|                |                                                                                                                                                                                                                                                                                                                                                        |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Example</b> | <p>The following example shows how to set aging time.</p> <pre>Switch(config)# <b>surveillance-vlan aging-time 720</b> Switch# <b>show surveillance-vlan</b> Administrate Surveillance VLAN state : disabled Surveillance VLAN ID      1 Surveillance VLAN Aging   : 720 minutes Surveillance VLAN CoS    5 Surveillance VLAN 1p Remark: enabled</pre> |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## show surveillance-vlan

|                  |                                                                                                                                                                                        |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>show surveillance-vlan</b><br><b>show surveillance-vlan interfaces [IF_PORTS]</b>                                                                                                   |
| <b>Parameter</b> | IF_PORTS                      Specifies interfaces to display surveillance VLAN settings in OUI mode                                                                                   |
| <b>Default</b>   | N/A                                                                                                                                                                                    |
| <b>Mode</b>      | Privileged EXEC                                                                                                                                                                        |
| <b>Usage</b>     | Use the <b>show surveillance vlan</b> 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**

---

|                  |                             |                                    |
|------------------|-----------------------------|------------------------------------|
| <b>Parameter</b> | <b>ACRONYM</b>              | Specify acronym name of time zone  |
|                  | <b>HOUR-OFFSET</b>          | Specify hour offset of time zone   |
|                  | <b>Minutes &lt;1-59&gt;</b> | 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

---

|              |                            |
|--------------|----------------------------|
| <b>local</b> | Specify to use static time |
| <b>sntp</b>  | 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**

**clock summer-time ACRONYM date**  
**(jan|feb|mar|apr|may|jun|jul|aug|sep|oct|nov|dec) <1-31> <2000-2037>**  
**HH:MM (jan|feb|mar|apr|may|jun|jul|aug|sep|oct|nov|dec) <1-31> <2000-**  
**2037> HH:MM [<1-1440>]**  
**clock summer-time ACRONYM recurring (usa|eu) [<1-1440>]**  
**clock summer-time ACRONYM recurring (<1-5>|first|last)**

---

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                  | (sun mon tue wed thu fri sat)<br>(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)<br>(jan feb mar apr may jun jul aug sep oct nov dec) HH:MM [<1-1440>]<br>no clock summer-time                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Parameter</b> | <p><b>ACRONYM</b> Specify acronym name of time zone</p> <p>(jan feb mar apr may jun jul aug sep oct nov dec) &lt;1-31&gt; &lt;2000-2037&gt; HH:MM<br/>(jan feb mar apr may jun jul aug sep oct nov dec) &lt;1-31&gt; &lt;2000-2037&gt; HH:MM</p> <p>&lt;1-1440&gt; Specify adjust offset of daylight saving time</p> <p><b>usa</b> Using daylight saving time in the United States that starts on the second Sunday of March and ends on the first Sunday of November</p> <p><b>eu</b> Using daylight saving time in the Europe that starts on the last Sunday in March and ending on the last Sunday in October</p> <p>(&lt;1-5&gt; first last) (sun mon tue wed thu fri sat) (jan feb mar apr may jun jul aug sep oct nov dec) HH:MM (&lt;1-5&gt; first last) (sun mon tue wed thu fri sat) (jan feb mar apr may jun jul aug sep oct nov dec) HH:MM</p> |
| <b>Default</b>   | No default daylight saving time is defined.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Mode</b>      | Global Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Usage</b>     | <p>Use the <b>clock summer-time</b> command to set daylight saving time for system time. The “<b>usa</b>” or “<b>eu</b>” means that use the global daylight saving policy which defined by international organization. In both the “<b>date</b>”and “<b>recurring</b>”, 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 “<b>recurring</b>” 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 <b>show clock detail Privileged EXEC</b> 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

|                 |                                               |
|-----------------|-----------------------------------------------|
| <b>HOSTNAME</b> | Specify ip address or hostname of sntp server |
| <b>sntp</b>     | 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

---

|                |                                                                                                                                                                              |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Default</b> | No default is defined                                                                                                                                                        |
| <b>Mode</b>    | Privileged EXEC                                                                                                                                                              |
| <b>Usage</b>   | Use the <b>show sntp</b> command to remote SNTP server information.                                                                                                          |
| <b>Example</b> | <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

|                  |                                                                                                                                                                                                                                                              |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <pre>errdisable recovery cause udd no errdisable recovery cause udd</pre>                                                                                                                                                                                    |
| <b>Parameter</b> | <u>N/A</u>                                                                                                                                                                                                                                                   |
| <b>Default</b>   | Error disable auto recovery is disabled by default.                                                                                                                                                                                                          |
| <b>Mode</b>      | Global EXEC                                                                                                                                                                                                                                                  |
| <b>Usage</b>     | Use the <b>errdisable recovery cause udd</b> to enable auto recovery of UniDirectional Link Detection (UDLD).<br>Use the “ <b>no</b> ” to disable it.                                                                                                        |
| <b>Example</b>   | <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.

|                |                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Mode</b>    | Interface Configuration                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Usage</b>   | Use the <b>udld aggressive</b> command to enable UniDirectional Link Detection (UDLD) aggressive mode of interface.<br>Use the no form of this command to restore to default setting.<br>You can verify your setting by entering the <b>show udld interface Privileged EXEC</b> command.                                                                                                                                                  |
| <b>Example</b> | The example shows how to enable udld aggressive mode in interface gi1.<br><br><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

|                  |                                                                                                                                               |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>udld message time</b> <i>message-time-interval</i>                                                                                         |
| <b>Parameter</b> | <i>message-time-interval</i> Specify the interval for sending message.<br>Range is 1 -90 seconds.                                             |
| <b>Default</b>   | Default interval is 15 seconds.                                                                                                               |
| <b>Mode</b>      | Global Configuration                                                                                                                          |
| <b>Usage</b>     | Use the <b>udld message time</b> to set interval of UniDirectional Link Detection (UDLD) sent message.                                        |
| <b>Example</b>   | The example shows how to set interval of UniDirectional Link Detection (UDLD) message.<br><br><pre>switch(config)# udld message time 30</pre> |

## udld reset

|                  |                                                                                                                                                                                                                                                                                                                                                     |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>udld reset</b>                                                                                                                                                                                                                                                                                                                                   |
| <b>Parameter</b> | N/A                                                                                                                                                                                                                                                                                                                                                 |
| <b>Default</b>   | No default is defined                                                                                                                                                                                                                                                                                                                               |
| <b>Mode</b>      | Privileged EXEC                                                                                                                                                                                                                                                                                                                                     |
| <b>Usage</b>     | Use the <b>udld reset</b> command to reset all interfaces disabled by the UniDirectional Link Detection (UDLD) and permit traffic to begin passing through them again.<br>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. |
| <b>Example</b>   | The example shows how to reset all interfaces disabled by UDLD<br><br>Switch# udld reset<br>1 ports shutdown by UDLD were reset.                                                                                                                                                                                                                    |

## show udld

|                  |                                                                                                                                                                |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>show udld</b><br><b>show udld interfaces</b> <i>IF_NMLPORTS</i>                                                                                             |
| <b>Parameter</b> | <i>IF_NMLPORTS</i> Specify the normal interfaces to display udld information                                                                                   |
| <b>Default</b>   | No default is defined                                                                                                                                          |
| <b>Mode</b>      | Privileged EXEC                                                                                                                                                |
| <b>Usage</b>     | Use the <b>show udld</b> command to to display UniDirectional Link Detection (UDLD) administrative and operational status for all ports or the specified port. |
| <b>Example</b>   | 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 100 |           |                     |              |        |
|             | 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



|                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Mode</b>    | Port Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Usage</b>   | <p>The VLAN mode is used to configure the port for different port role.<br/> <b>Access port:</b> Accepts only untagged frames and join an untagged VLAN.<br/> <b>Hybrid port:</b> Support all functions as defined in IEEE 802.1Q specification. <b>Trunk port:</b> 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.<br/> <b>Tunnel port:</b> Port-based Q-in-Q mode.</p> <p>Use the <b>switch mode</b> port configuration command to set mode of interface You can verify your setting by entering the <b>show interfaces switchport Privileged EXEC</b> command.</p> |
| <b>Example</b> | <p>This example sets VLAN mode to Access port.</p> <pre>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:</pre> <p>Port is member in:</p> <pre>Vlan  Name    Egress rule -----   1  default  Untagged</pre> <p>Forbidden VLANs:</p> <pre>Vlan Name -----</pre> <p>SwitchEF0101#</p>                                                                                                                                                 |

### switchport hybrid pvid

|                  |                                                             |
|------------------|-------------------------------------------------------------|
| <b>Syntax</b>    | <b>switchport hybrid pvid &lt;1-4094&gt;</b>                |
| <b>Parameter</b> | <1-4094> Specify the port-based VLAN ID on the Hybrid port. |
| <b>Default</b>   | Default pvid is 1.                                          |

|                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Mode</b>    | Port Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Usage</b>   | Use the <b>switch hybrid pvid</b> port configuration command to set pvid of interface.<br>You can verify your setting by entering the <b>show interfaces switchport Privileged EXEC</b> command.                                                                                                                                                                                                                                                                                                                         |
| <b>Example</b> | <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

|                |                                                                                                                                                                    |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>  | <b>switchport hybrid<br/>ingress-filtering no switchport<br/>hybrid ingress-filtering</b>                                                                          |
| <b>Default</b> | Default is enabled                                                                                                                                                 |
| <b>Mode</b>    | Port Configuration                                                                                                                                                 |
| <b>Usage</b>   | Use the <b>switchport hybrid ingress-filtering</b> port configuration command to enable vlan ingress filter.<br>Use the <b>no</b> 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  <br>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 tunnel vlan <1-4094> insert <1-4094>

### Syntax

```

switchport tunnel vlan
<1-4094> insert <1-4094> no
switchport tunnel vlan

```

### Parameter

|             |                                                 |
|-------------|-------------------------------------------------|
| tunnel vlan | Specifies the tunnel VLAN ID.                   |
| insert vlan | Specifies the VLAN ID of the tunnel to be added |

### Default

Default not configured

### Mode

Port Configuration

### Usage

Run the switchport tunnel vlan <1-4094> insert <1-4094> command to set the dynamic qinq tunnel vlan of a specified vlan on an interface.

### Example

Configure vlan10's qinq tunnel vlan to VLAN 100.

```

Switch(config)# interface gi10
Switch(config-if)# switchport mode hybrid
Switch(config-if)# switchport hybrid allowed vlan add 10,100 tagged
Switch(config-if)# switchport tunnel vlan 10 insert 100

```



## switchport tunnel vlan <1-4094> to <1-4094> insert <1-4094>

|                  |                                                                                                                                                                                                                                                                                                        |                                                 |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|
| <b>Syntax</b>    | <b>switchport tunnel vlan</b><br><b>&lt;1-4094&gt; to &lt;1-4094&gt; insert</b><br><b>&lt;1-4094&gt; no switchport</b><br><b>tunnel vlan &lt;1-4094&gt; to</b><br><b>&lt;1-4094&gt;</b>                                                                                                                |                                                 |
| <b>Parameter</b> | tunnel vlan                                                                                                                                                                                                                                                                                            | Specifies the VLAN ID range of a Tunnel.        |
|                  | insert vlan                                                                                                                                                                                                                                                                                            | Specifies the VLAN ID of the tunnel to be added |
| <b>Default</b>   | Default not configured                                                                                                                                                                                                                                                                                 |                                                 |
| <b>Mode</b>      | Port Configuration                                                                                                                                                                                                                                                                                     |                                                 |
| <b>Usage</b>     | Run the switchport tunnel vlan <1-4094> to <1-4094> command.<br>insert <1-4094> sets the dynamic qinq tunnel vlan of a specified vlan range on the interface.                                                                                                                                          |                                                 |
| <b>Example</b>   | Set the vlan of a tunnel from vlan15 to vlan20 to vlan100.<br><br><pre> Switch(config)# interface gi10 Switch(config-if)# switchport mode hybrid Switch(config-if)# switchport hybrid allowed vlan add 15-20,100 tagged Switch(config-if)# switchport tunnel vlan 15 to 20 insert 100           </pre> |                                                 |

## switchport trunk native vlan

|                  |                                                                                                                                                                                                                                                                                                                                                                     |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>switchport trunk native vlan &lt;1-4094&gt;</b><br><b>no switchport trunk native vlan</b>                                                                                                                                                                                                                                                                        |
| <b>Parameter</b> | <1-4094> Specifies the native VLAN ID.                                                                                                                                                                                                                                                                                                                              |
| <b>Default</b>   | Default is vlan 1                                                                                                                                                                                                                                                                                                                                                   |
| <b>Mode</b>      | Port Configuration                                                                                                                                                                                                                                                                                                                                                  |
| <b>Usage</b>     | Use the <b>switchport trunk native vlan</b> port configuration command to set native vlan on interface.<br>Use the <b>no</b> form of this command to restore to default vlan.<br>You can verify your setting by entering the <b>s show interfaces switchport Privileged EXEC</b> command.                                                                           |
| <b>Example</b>   | This example sets Trunk port fa10 native VLAN to 100.<br><br>SwitchEF0101(config)# interface fa10<br>SwitchEF0101(config-if)# switchport mode trunk<br>SwitchEF0101(config-if)# switchport trunk native vlan 100<br>SwitchEF0101# show interfaces switchport fa10<br>Port : fa10<br>Port Mode : Trunk Ingress<br>Filtering : enabled<br>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

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>switchport forbidden default-vlan no switchport forbidden default-vlan</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Parameter</b> | None                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Default</b>   | Default is allowed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Mode</b>      | Port Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Usage</b>     | <p>Use the <b>switchport forbidden default-vlan</b> port configuration command to forbid default-vlan on interface.</p> <p>Use the <b>no switchport forbidden default-vlan</b> port configuration command to restore to default</p> <p>You can verify your setting by entering the <b>s show interfaces switchport Privileged EXEC</b> command</p>                                                                                                                                                                                 |
| <b>Example</b>   | <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**

---



|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                |                                     |           |                        |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------------------------------|-----------|------------------------|
| <b>Parameter</b> | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; padding: 2px;">(add   remove)</td> <td style="padding: 2px;">Add or remove forbidden membership.</td> </tr> <tr> <td style="padding: 2px;">VLAN-LIST</td> <td style="padding: 2px;">Specify the VLAN list.</td> </tr> </table>                                                                                                                                                                                                                 | (add   remove) | Add or remove forbidden membership. | VLAN-LIST | Specify the VLAN list. |
| (add   remove)   | Add or remove forbidden membership.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                |                                     |           |                        |
| VLAN-LIST        | Specify the VLAN list.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                |                                     |           |                        |
| <b>Default</b>   | No vlan is forbidden by default                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                |                                     |           |                        |
| <b>Mode</b>      | Port Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                |                                     |           |                        |
| <b>Usage</b>     | <p>Use the <b>switchport forbidden vlan add</b> port configuration command to forbid vlan on interface.</p> <p>Use the <b>switchport forbidden vlan remove</b> port configuration command to accept vlan on interface.</p> <p>You can verify your setting by entering the <b>show interfaces switchport</b> <b>Privileged EXEC</b> command</p>                                                                                                                                                                                                |                |                                     |           |                        |
| <b>Example</b>   | <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)**

|                  |                                                                                                                                                                                              |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Parameter</b> | (0x8100 0x88a8 0x9100 0x9200) Select TPID to set.                                                                                                                                            |
| <b>Default</b>   | Default TPID is 0x8100                                                                                                                                                                       |
| <b>Mode</b>      | Port Configuration                                                                                                                                                                           |
| <b>Usage</b>     | Use the <b>switchport vlan tpid</b> port configuration command to set TPID on interface.<br>You can verify your setting by entering the <b>s show running-config Privileged EXEC</b> command |
| <b>Example</b>   | This example sets the TPID to 0x9100 on interface fa10.<br><br>SwitchEF0101(config)# interface fa10<br>SwitchEF0101(config-if)# switchport vlan tpid 0x9100                                  |

## management-vlan

|                  |                                                                                                                                                                                                                                                                                                        |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>management-vlan vlan</b><br><b>&lt;1-4094&gt; no</b><br><b>management-vlan</b>                                                                                                                                                                                                                      |
| <b>Parameter</b> | <b>&lt;1-4094&gt;</b> Specify the VLAN ID of management-vlan.                                                                                                                                                                                                                                          |
| <b>Default</b>   | Default management vlan is 1.                                                                                                                                                                                                                                                                          |
| <b>Mode</b>      | Global Configuration                                                                                                                                                                                                                                                                                   |
| <b>Usage</b>     | Use the <b>management vlan</b> Global Configuration mode command to set management vlan id. Vlan id must be created first.<br>Use the <b>no</b> form of this command to restore to default setting.<br>You can verify your setting by entering the <b>show management-vlan Privileged EXEC</b> command |
| <b>Example</b>   | (1) The following example specifies that management vlan 2 is created<br>Switch(config)#vlan 2<br>Switch(config)# management-vlan vlan 2<br>(2)The following example specifies that management-vlan is restored to be default VLAN.<br>Switch(config)# no management-vlan                              |

## show vlan

|                  |                                                                                                                                                                                                                                                                                                                                               |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>show vlan [(VLAN-LIST dynamic static)]</b>                                                                                                                                                                                                                                                                                                 |
| <b>Parameter</b> | (VLAN-LIST dynamic static) Specify vlan id to show information or show all static or dynamic vlan entries.                                                                                                                                                                                                                                    |
| <b>Default</b>   | Nones                                                                                                                                                                                                                                                                                                                                         |
| <b>Mode</b>      | Privileged EXEC                                                                                                                                                                                                                                                                                                                               |
| <b>Usage</b>     | Display information about vlan entry                                                                                                                                                                                                                                                                                                          |
| <b>Example</b>   | <p>The following example specifies that show vlan</p> <pre>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</pre> |

## show vlan interface membership

|                  |                                                                                                                                                                          |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>show vlan VLAN-LIST interfaces IF_PORTS membership</b>                                                                                                                |
| <b>Parameter</b> | <p>&lt;VLAN-List&gt; Specify vlan to show</p> <p>IF_PORTS Specify interface is to show</p>                                                                               |
| <b>Default</b>   | Nones                                                                                                                                                                    |
| <b>Mode</b>      | Privileged EXEC                                                                                                                                                          |
| <b>Usage</b>     | Display information about vlan membership on interfaces.                                                                                                                 |
| <b>Example</b>   | <p>The following example specifies that show vlan interface membership</p> <pre>Switch# show vlan 100 interfaces fa10 membership  VLAN ID : 100 VLAN Type : Static</pre> |

```

-----+-----
Port | Membership
-----+-----
fa10 | Excluded
-----+-----

```

## show interface switchport

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>show interface switchport interfaces IF_PORTS</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Parameter</b> | IF_PORTS Specify interfaces protocol vlan to display                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Default</b>   | None                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Mode</b>      | Privileged EXEC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Usage</b>     | Display information about default vlan                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Example</b>   | <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

|               |                             |
|---------------|-----------------------------|
| <b>Syntax</b> | <b>show management-vlan</b> |
|---------------|-----------------------------|

|                  |                                                                                                                                      |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| <b>Parameter</b> | None                                                                                                                                 |
| <b>Default</b>   | Nones                                                                                                                                |
| <b>Mode</b>      | Privileged EXEC                                                                                                                      |
| <b>Usage</b>     | Display information about management vlan                                                                                            |
| <b>Example</b>   | The following example specifies that show management vlan<br>Switch(config)# show management-vlan<br>Management VLAN-ID : default(1) |

## 36. Voice VLAN

### voice-vlan (Global)

|                  |                                                                                                                                                                                                                                                                                                     |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>voice-vlan</b><br><b>no voice-vlan</b>                                                                                                                                                                                                                                                           |
| <b>Parameter</b> |                                                                                                                                                                                                                                                                                                     |
| <b>Default</b>   | Voice VLAN is disabled                                                                                                                                                                                                                                                                              |
| <b>Mode</b>      | Global Configuration                                                                                                                                                                                                                                                                                |
| <b>Usage</b>     | Use the <b>voice vlan</b> global configuration command to enable the functional Voice VLAN on the device.<br>Use the <b>no</b> form of this command to disable voice vlan function.<br>You can verify your setting by entering the <b>show voice vlan Privileged EXEC</b> command.                  |
| <b>Example</b>   | The following example shows how to enable voice vlan.<br>Switch(config)# <b>voice-vlan</b><br>Switch# <b>show voice-vlan</b><br>Administrate Voice VLAN state : disabled<br>Voice VLAN ID : none (disable)<br>Voice VLAN Aging : 1440 minutes<br>Voice VLAN CoS 6<br>Voice VLAN 1p Remark: disabled |

## voice-vlan (Interface)

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>voice-vlan</b><br><b>no voice-vlan</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Parameter</b> | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Default</b>   | The default all port admin-status is disabled.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Mode</b>      | Interface Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Usage</b>     | Use the <b>voice vlan</b> Interface configuration command to enable OUI voice VLAN configuration on an interface<br>Use the <b>no</b> form of this command to disable voice vlan on an interfaces<br>You can verify your setting by entering the <b>show voice vlan Privileged EXEC</b> command                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Example</b>   | <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

|                  |                                                                                                                                                                                                                                                                                                                                   |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>voice-vlan vlan</b> <1-4094><br><b>no voice-vlan vlan</b>                                                                                                                                                                                                                                                                      |
| <b>Parameter</b> | <1-4094> Specify the voice VLAN ID                                                                                                                                                                                                                                                                                                |
| <b>Default</b>   | The default Voice VLAN ID is None.                                                                                                                                                                                                                                                                                                |
| <b>Mode</b>      | Global Configuration                                                                                                                                                                                                                                                                                                              |
| <b>Usage</b>     | Use the <b>voice vlan id</b> global configuration command to configure the VLAN identifier of the voice VLAN statically.<br>Use the <b>no</b> form of this command to restore voice vlan id to default.<br>You can verify your setting by entering the <b>show voice vlan Privileged EXEC</b> command                             |
| <b>Example</b>   | The following example shows how to set Voice vlan id. The vlan id must be created first.<br>Switch(config)# <b>voice-vlan vlan 128</b><br>Switch# <b>show voice-vlan</b><br>Administrate Voice VLAN state : enabled<br>Voice VLAN ID 128<br>Voice VLAN Aging : 1440 minutes<br>Voice VLAN CoS 6<br>Voice VLAN Ip Remark: disabled |

## voice-vlan oui-table

|                  |                                                                                                                                            |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>voice-vlan oui-table</b> A:B:C [DESCRIPTION]<br><b>no voice-vlan oui-table</b> [A:B:C]                                                  |
| <b>Parameter</b> | A:B:C Specify OUI Mac address to add or remove<br>DESCRIPTION Specify description of the specified MAC address to the voice VLAN OUI table |
| <b>Default</b>   | 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    |



|                |                                                                                                                                                                                                                                                                                                                                          |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Default</b> | The default cos value is 6, remark is disabled.                                                                                                                                                                                                                                                                                          |
| <b>Mode</b>    | Global Configuration                                                                                                                                                                                                                                                                                                                     |
| <b>Usage</b>   | Use the <b>voice vlan cos</b> global configuration command to configure the voice VLAN cos value and 1p remark function<br>Use the “ <b>no</b> ” form to restore to default mode.<br>You can verify your setting by entering the <b>show voice vlan Privileged EXEC</b> command                                                          |
| <b>Example</b> | The following example show how to set cos value and enable 1p remark function<br>Switch(config)# <b>voice-vlan cos 7 remark</b><br>Switch# <b>show voice-vlan</b><br>Administrate Voice VLAN state : disabled<br>Voice VLAN ID       128<br>Voice VLAN Aging    : 1440 minutes<br>Voice VLAN CoS      7<br>Voice VLAN 1p Remark: enabled |

## voice-vlan cos (Interface)

|                  |                                                                                                                                                                                                                                                                                                     |     |                                                                                    |     |                                                                                      |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------------------------------------------------------------------------------------|-----|--------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>voice-vlan cos ( src   all )</b><br><b>no voice-vlan cos</b>                                                                                                                                                                                                                                     |     |                                                                                    |     |                                                                                      |
| <b>Parameter</b> | <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.                                                                                                                                                                                                                |     |                                                                                    |     |                                                                                      |
| <b>Default</b>   | The default all port in Src mode.                                                                                                                                                                                                                                                                   |     |                                                                                    |     |                                                                                      |
| <b>Mode</b>      | Interface configuration                                                                                                                                                                                                                                                                             |     |                                                                                    |     |                                                                                      |
| <b>Usage</b>     | Use the <b>voice vlan cos</b> Interface configuration command to configure OUI voice VLAN cos mode configuration on an interface<br>Use the “ <b>no</b> ” form to restore to default mode.<br>You can verify your setting by entering the <b>show voice-vlan interfaces Privileged EXEC</b> command |     |                                                                                    |     |                                                                                      |
| <b>Example</b>   | The following example how to configure voice packet QoS attributes on an interface<br>Switch(config)# <b>interface range fa1-3</b><br>Switch(config-if)# <b>voice-vlan cos all</b>                                                                                                                  |     |                                                                                    |     |                                                                                      |

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

|               |                                                                                                                                                                                                                                                       |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>auto</b>   | 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. |
| <b>manual</b> | 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 aging-time** <30-65536>  
**no voice-vlan aging-time**

**Parameter** <30-65536> Specify the voice VLAN aging timeout interval in minutes

|                |                                                                                                                                                                                                                                                                                                              |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Default</b> | The default aging-timeout value is 1440 minutes                                                                                                                                                                                                                                                              |
| <b>Mode</b>    | Global Configuration                                                                                                                                                                                                                                                                                         |
| <b>Usage</b>   | Use the <b>voice vlan aging-time</b> global configuration command to configure the voice VLAN aging timeout.<br>Use the “ <b>no</b> ” form to restore to default time.<br>You can verify your setting by entering the <b>show voice vlan Privileged EXEC</b> command                                         |
| <b>Example</b> | The following example shows how to set aging time.<br>Switch(config)# <b>voice-vlan aging-time 720</b><br>Switch# <b>show voice-vlan</b><br>Administrate Voice VLAN state : disabled<br>Voice VLAN ID       1<br>Voice VLAN Aging    : 720 minutes<br>Voice VLAN CoS      5<br>Voice VLAN Ip Remark: enabled |

## show voice-vlan

|                  |                                                                                                                                                                   |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>show voice-vlan</b><br><b>show voice-vlan interfaces [IF_PORTS]</b>                                                                                            |
| <b>Parameter</b> | IF_PORTS                   Specifies interfaces to display voice VLAN settings in oui mode                                                                        |
| <b>Default</b>   | N/A                                                                                                                                                               |
| <b>Mode</b>      | Privileged EXEC                                                                                                                                                   |
| <b>Usage</b>     | Use the <b>show voice vlan</b> 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 |
| <b>Example</b>   | The following example show how to display voice vlan oui mode settings<br>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 | ipaddr | Specify IPv4 address for switch     |
|-----------|--------|-------------------------------------|
|           | mask   | Specify net mask address for switch |

```
Default The vlan interface and ip address are not configured by default.
```

---

**Mode** Global configuration and vlan interface configuration.

---

**Usage** Use the **interface vlan** global configuration command to config ip interface on the device.  
Use the **ip address** command in vlan interface mode to configure the device's ip address.  
Use the **no ip address** command to delete the configured ip address.  
Use the **no interface vlan** command to delete ip interface on the device.  
You can verify your setting by entering the **show ip interface vlan** Privileged EXEC command.

---

**Example** The following example shows how to config ip interface.  
Switch(config)# **interface vlan 2**  
Switch(config-if)# **ip address 192.168.3.1 255.255.255.0**  
Switch# **show ip interface vlan 2**

| IP Address     | I/F    | I/F Status admin/oper | Type   |
|----------------|--------|-----------------------|--------|
| 192.168.3.1/24 | VLAN 2 | UP/DOWN               | Static |

Valid

---

## IPv4 Routes

|                      |                                                                                                                                                                                                                                                                        |                    |                               |             |                                    |                      |                                |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------------------------------|-------------|------------------------------------|----------------------|--------------------------------|
| <b>Syntax</b>        | <b>ip route</b> <i>dest-ipaddr</i> <i>mask</i> <i>router-ipaddr</i><br><b>no ip route</b> <i>dest-ipaddr</i> <i>mask</i> <i>router-ipaddr</i>                                                                                                                          |                    |                               |             |                                    |                      |                                |
| <b>Parameter</b>     | <table border="1"> <tr> <td><i>dest-ipaddr</i></td> <td>Destination ip address prefix</td> </tr> <tr> <td><i>mask</i></td> <td>Destination ip address prefix mask</td> </tr> <tr> <td><i>router-ipaddr</i></td> <td>Forwarding router's ip address</td> </tr> </table> | <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 |
| <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                                                                                                                                                                                                                                         |                    |                               |             |                                    |                      |                                |
| <b>Default</b>       | Static route is not configured by default.                                                                                                                                                                                                                             |                    |                               |             |                                    |                      |                                |
| <b>Mode</b>          | Global Configuration mode.                                                                                                                                                                                                                                             |                    |                               |             |                                    |                      |                                |
| <b>Usage</b>         | Use the <b>ip route</b> command in global mode to configure a static route rule.<br>Use the <b>no ip route</b> command to delete a static routing rule.<br>You can verify your setting by entering the <b>show ip route</b> Privileged EXEC command                    |                    |                               |             |                                    |                      |                                |

|                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Example</b> | <p>The following example shows how to configure a static route.</p> <pre>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: &gt; - best, C - connected, S - static  S&gt; 1.0.0.0/8 [1/1] via 192.168.3.11, VLAN 2 C&gt; 192.168.0.0/24 is directly connected, MGMT VLAN C&gt; 192.168.3.0/24 is directly connected, VLAN 2</pre> |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## IPv4 ARP

|                  |                                                                                                                                                                                                                                            |                |                         |                 |                          |               |                           |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------------------|-----------------|--------------------------|---------------|---------------------------|
| <b>Syntax</b>    | <b>arp</b> <i>ip-addr</i> <i>mac-addr</i> <b>vlan</b> <i>vlanid</i><br><b>no arp</b> <i>ip-addr</i> <i>mac-addr</i> <b>vlan</b> <i>vlanid</i>                                                                                              |                |                         |                 |                          |               |                           |
| <b>Parameter</b> | <table border="1"> <tr> <td><i>ip-addr</i></td> <td>IP address of ARP entry</td> </tr> <tr> <td><i>mac-addr</i></td> <td>MAC address of ARP entry</td> </tr> <tr> <td><i>vlanid</i></td> <td>Vlan ID of this arp entry</td> </tr> </table> | <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 |
| <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                                                                                                                                                                                                                  |                |                         |                 |                          |               |                           |
| <b>Default</b>   | The device contains ARP entries of the vlan interface.                                                                                                                                                                                     |                |                         |                 |                          |               |                           |

|              |                                                                                                                                                                                                             |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Mode</b>  | Global Configuration mode.                                                                                                                                                                                  |
| <b>Usage</b> | Use the <b>arp</b> command to add a static arp entry.<br>Use the <b>no arp</b> command to delete a static arp entry.<br>You can verify your setting by entering the <b>show arp</b> Privileged EXEC command |

| <b>Example</b> | <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

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                     |               |                            |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|----------------------------|
| <b>Syntax</b>    | <pre>interface vlan <i>vlanid</i>   ipv6 enable no interface vlan <i>vlanid</i>   no ipv6 enable</pre>                                                                                                                                                                                                                                                                                                                                              |               |                            |
| <b>Parameter</b> | <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                                                                                                                                                                                                                                                                                                                                                                                                                          |               |                            |
| <b>Default</b>   | The vlan interface are not configured by default.Ipv6 is disabled.                                                                                                                                                                                                                                                                                                                                                                                  |               |                            |
| <b>Mode</b>      | Global configuration and vlan interface configuration.                                                                                                                                                                                                                                                                                                                                                                                              |               |                            |
| <b>Usage</b>     | Use the <b>interface vlan</b> global configuration command to config ip interface on the device.<br>Use the <b>ipv6 enable</b> command in vlan interface mode to enable ipv6 function.<br>Use the <b>no ipv6 enable</b> command to disable ipv6 function.<br>Use the <b>no interface vlan</b> command to delete ip interface on the device.<br>You can verify your setting by entering the <b>show ipv6 interface vlan</b> 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** *ipv6-addr* Manually configured ipv6 address

**Default** The vlan interface are not configured by default.Ipv6 is disabled.

**Mode** Global configuration and vlan interface configuration.

**Usage** Use the **ipv6 address** command in vlan interface mode to config a manual ipv6 address.  
Use the **no ipv6 address** command in vlan interface mode to delete all manual ipv6 addresses on this vlan interface.  
You can verify your setting by entering the **show ipv6 interface vlan** Privileged EXEC command.

**Example** The following example shows how to config ip interface.

```
Switch(config)# interface vlan 2
Switch(config-if)# ipv6 address 2001:01::01:01/64
Switch# show ipv6 interface vlan 2
```

```
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

|                  |                                                                                                                                                                                                                                                                            |                                    |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|
| <b>Syntax</b>    | <b>ipv6 route</b> <i>ipv6-addr/length route-ipv6-addr</i><br><b>no ipv6 address</b> <i>ipv6-addr/length</i>                                                                                                                                                                |                                    |
| <b>Parameter</b> | <i>ipv6-addr/length</i>                                                                                                                                                                                                                                                    | Destination ipv6 prefix and length |
|                  | <i>route-ipv6-addr</i>                                                                                                                                                                                                                                                     | Forwarding router's ipv6 address   |
| <b>Default</b>   | The ipv6 routing entry is not configured by default.                                                                                                                                                                                                                       |                                    |
| <b>Mode</b>      | Global configuration and vlan interface configuration.                                                                                                                                                                                                                     |                                    |
| <b>Usage</b>     | Use the <b>ipv6 route</b> command to configure a static ipv6 routing entry.<br>Use the <b>no ipv6 address</b> command to delete a static ipv6 routing entry.<br>You can verify your setting by entering the <b>show ipv6 route static</b> Privileged EXEC command.         |                                    |
| <b>Example</b>   | The following example shows how to configure an ipv6 routing entry.<br>Switch(config)# <b>ipv6 route 2002:01::01:01/96 2001:01::01:02</b><br>Switch# <b>show ipv6 route static</b><br>Codes: A - active, I - inactive<br><br>I 2002:1::/96 [1/1] via 2001:1::1:2, inactive |                                    |

## IPv6 Neighbors

|                  |                                                                                      |                                    |
|------------------|--------------------------------------------------------------------------------------|------------------------------------|
| <b>Syntax</b>    | <b>ipv6 neighbor</b> <i>ipv6-addr vlan vlanid macaddr</i><br><b>no ipv6 neighbor</b> |                                    |
| <b>Parameter</b> | <i>ipv6-addr</i>                                                                     | Neighbor ipv6 address              |
|                  | <i>vlanid</i>                                                                        | Vlan interface number              |
|                  | <i>macaddr</i>                                                                       | MAC address of ipv6 neighbor entry |
| <b>Default</b>   | No ipv6 neighbor address by default.                                                 |                                    |
| <b>Mode</b>      | Global configuration.                                                                |                                    |
| <b>Usage</b>     | Use the <b>ipv6 neighbor</b> 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 HW
address Status Router State
```

```


```

```
vlan 2 2001:1::1:11
00:00:00:11:11:12 Static No
```

```
Total number of entries: 1
```

---

## 38. ERPS

### Erps (global)

---

**Syntax**            erps  
                  no erps

---

**Parameter**       no

---

---

**Default**            disable

---

**Mode**                global configuration.

---

**Usage**                Run the "erps" command to enable global ERPS.

---

**Example**            Enable ERPS  
Switch(config)# erps

---

### Erps instance (Global)

---

**Syntax**            erps instance    <1-15>

**no erps instance <1-15>**

---

|                  |                                                           |
|------------------|-----------------------------------------------------------|
| <b>Parameter</b> | <1-15>instance id range                                   |
| <b>Default</b>   | no                                                        |
| <b>Mode</b>      | global configuration.                                     |
| <b>Usage</b>     | Run the erps instance command to create an ERPS instance. |
| <b>Example</b>   | Set ERPS instance to 0<br>Switch(config)# erps instance 0 |

---

## Control-vlan

---

|                  |                                                                               |
|------------------|-------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>control-vlan &lt;1-4094&gt;</b><br><b>no control-vlan</b>                  |
| <b>Parameter</b> | <1-4094>vlan id range                                                         |
| <b>Default</b>   | default vlan id 1                                                             |
| <b>Mode</b>      | ERPS configuration mode.                                                      |
| <b>Usage</b>     | Run the control-vlan command to set up an ERPS instance to control a VLAN.    |
| <b>Example</b>   | Example Set the control VLAN to 2<br>Switch(config-erps-inst)# control-vlan 2 |

---

## wtr-timer

---

|                  |                                                      |
|------------------|------------------------------------------------------|
| <b>Syntax</b>    | <b>wtr-timer &lt;1-12&gt;</b><br><b>no wtr-timer</b> |
| <b>Parameter</b> | <1-12> wtr timer value is from 1 to 12 minutes       |

---

**Default** default 5 minutes

**Mode** erps configuration mode.

**Usage** Run the wtr-timer command to set the WTR time in the ERPS.

**Example** Set the WTR time of the ERPS to 6 minutes  
Switch(config-erps-inst)# **wtr-timer 6**

---

## guard-timer

**Syntax** **guard-timer <100-2000>**  
**no guard-timer**

**Parameter** <100-2000>ms

**Default** default guard timer is 500ms

**Mode** erps configuration mode.

**Usage** Run the guard-timer command to set the guard time in the ERPS.

**Example** Set erps ring guard-timer 100ms  
Switch(config-erps-inst)# **guard-timer 100**

---

## work-mode

**Syntax** **work-mode non\_revertive**  
**work-mode revertive**

**Parameter** no

**Default** Default Revertive Indicates the reversible mode

---

**Mode** erps configuration mode.

---

**Usage** Run the "work-mode revertive" command to set the working mode in ERPS..

---

**Example** Set ERPS working mode to the reversible mode  
Switch(config-erps-inst)# work-mode revertive

---

## ring<ID>

---

**Syntax** ring <1-239>

---

**Parameter** <1-239>ring id is from 1 to 239

---

---

**Default** The default ring ID is 1

---

**Mode** erps configuration mode.

---

**Usage** Run the "ring <1-239>" command to set the ring ID of the ERPS.

---

**Example** Example Set the ring ID to 2  
Switch(config-erps-inst)# **ring 2**

---

## ring-level

---

**Syntax** ring-level <0-1>

---

**Parameter** <0-1>0 is the primary ring and 1 is the subring

---

---

**Default** 0 is the primary ring

---

**Mode** erps configuration mode.

---

**Usage** Run the "ring-level <0-1>" command to set the primary ring to 0 and the

subring to 1 in the ERPS

**Example** Set the ERPS ring to subring  
Switch(config-erps-inst)# **ring-level 1**

---

## port

---

**Syntax** port0 IF\_PORTS (owner|neighbour|next-neighbour)

Port1 IF\_PORTS (owner|neighbour|next-neighbour)

---

**Parameter** IF\_PORTS port number

---

**Default** port1

---

**Mode** erps configuration mode.

---

**Usage** Use the command "port0 IF\_PORTS (owner | neighbour | next - neighbour)" set the erps central to the owner, neighbour, next - neighbour.

**Example** Set port 2 as the owner node  
Switch(config-erps-inst)# **port0 GigabitEthernet2 owner**

---

## mel

---

**Syntax** mel <0-7>

---

**Parameter** <0-7> mel value is form 0 to 7

---

**Default** mel is 0

---

**Mode** erps configuration mode.

---

**Usage** Use the command "MEL <0-7>" to set the instance level in ERPS.

**Example** Example Set the instance mel to 2  
Switch(config-erps-inst)# **mel 2**

---

## Ring enable

**Syntax** ring enable

ring disable

---

**Parameter** no

---

**Default** disable

---

**Mode** erps configuration mode.

---

**Usage** Use the command "ring (enable | disable)" set the erps central is enabled.

**Example** Set ring enable  
Switch(config-erps-inst)# **ring enable**

---

## protected-instance

---

**Syntax** protected-instance <0-15>

---

**Parameter** <0-15> mstp instance id is form 0 to 15

---

**Default** no

---

**Mode** erps configuration mode.

---

**Usage** Using the command 'protected-instance' Sets the loop protection instance



**Example** Set ring protected-instance is 1  
Switch(config-erps-inst)# **protected-instance 1**

---

## Show erps instance

---

**Syntax** show erps instance all

show erps instance <0-15>

---

**Parameter** <0-15>instance id form 0 to 15

---

**Default** no

---

**Mode** global configuration.

---

**Usage** display erps information

**Example** Display erps information  
Switch# **show erps instance all**

```
Erps instance : 1
Erps ring status :disable
Erps mel :1
Erps control vlan : 1
Erps WTR time : 5 min
Erps guard time : 500 ms
Erps work-mode :revertive
Erps ring ID :1
Erps ring-level :0
Erps protected-instance :0
Erps port0 portId:GE1, port role :rpl, port status:forwarding
Erps port1 portId:GE1, port role :rpl, port status:forwarding
Erps ring node state :init
```

---

## 39. OSPF

### Ospf (global)

---

**Syntax** ospf

no ospf

---

**Parameter** no

---

**Default**                    disable

---

**Mode**                        global configuration.

---

**Usage**                      Run the ospf command to enable and enter OSPF process 1.

**Example**                    Eenable OSPF  
Switch(config)# **ospf**  
Switch(config-ospf-1)#  
Example Query OSPF process information.  
Switch# **show ospf**  
FOUND.000                    aaaaa.txt                    cccc.txt  
System Volume Information   bbbb.txt  
Switch#  
  OSPF Process 1, Router ID: 1.1.1.1  
  Supports only single TOS (TOS0) routes  
  This implementation conforms to RFC2328  
  RFC1583Compatibility flag is disabled  
  OpaqueCapability flag is disabled  
  Initial SPF scheduling delay 0 millise(c)s  
  Minimum hold time between consecutive SPF(s) 50 millise(c)s  
  Maximum hold time between consecutive SPF(s) 5000 millise(c)s  
  Hold time multiplier is currently 2  
  SPF algorithm last executed 5m44s ago  
  SPF timer is inactive  
  LSA minimum interval 0 msec(s)  
  LSA minimum arrival 0 msec(s)  
  Write Multiplier set to 0  
  Refresh timer 10 sec(s)  
  This router is an ABR, ABR type is: Alternative Cisco  
  Number of external LSA 0. Checksum Sum 0x00000000  
  Number of opaque AS LSA 0. Checksum Sum 0x00000000  
  Number of areas attached to this router: 2  
  Area ID: 0.0.0.0 (Backbone)  
    Number of interfaces in this area: Total: 3, Active: 1  
    Number of fully adjacent neighbors in this area: 0  
    Area has no authentication  
    SPF algorithm executed 2 times  
    Number of LSA 2  
    Number of router LSA 1. Checksum Sum 0x0000ce04  
  
    Number of summary LSA 1. Checksum Sum 0x0000914a  
    Number of ASBR summary LSA 0. Checksum Sum 0x00000000  
    Number of NSSA LSA 0. Checksum Sum 0x00000000  
    Number of opaque link LSA 0. Checksum Sum 0x00000000  
    Number of opaque area LSA 0. Checksum Sum 0x00000000  
  
  Area ID: 0.0.0.1  
    Shortcutting mode: Default, S-bit consensus: ok  
    Number of interfaces in this area: Total: 1, Active: 1  
    Number of fully adjacent neighbors in this area: 0  
    Area has no authentication  
    Number of full virtual adjacencies going through this area: 0  
    SPF algorithm executed 1 times

---

Number of LSA 2  
Number of router LSA 1. Checksum Sum 0x000017b3  
Number of network LSA 0. Checksum Sum 0x00000000  
Number of summary LSA 1. Checksum Sum 0x0000e9f9  
Number of ASBR summary LSA 0. Checksum Sum 0x00000000  
Number of NSSA LSA 0. Checksum Sum 0x00000000  
Number of opaque link LSA 0. Checksum Sum 0x00000000  
Number of opaque area LSA 0. Checksum Sum 0x00000000

---

## router-id

---

**Syntax**            **router-id A.B.C.D**

**no router-id**

---

**Parameter**        A.B.C.D ipv4 address

---

---

**Default**            no

---

**Mode**                ospf configuration mode.

---

**Usage**                Run the "router-id 1.1.1.1" command to set the router ID of OSPF process 1 to 1.1.1.1.

---

**Example**            Switch(config)# **ospf**  
Switch(config-ospf-1)#**router-id 1.1.1.1**

---

## timers throttle spf

---

**Syntax**            **timers throllle spf <0-600000> <0-600000> <0-600000>**

**no timers throllle spf**

---

**Parameter**        <1-4094>vlan id

---

---

**Default**            delay time 0, hlod time 50, max hold time 5000

---

**Mode**                ospf configuration mode.

---

**Usage**                Run the timers throllle SPF 10 100 10000 command to configure the timer for SPF calculation of OSPF process 1.

Delay time <0-60000>  
Delay time between receiving topology change and SPF calculation  
Hold time <0-60000>  
Hold time between two discontinuous SPF calculations  
Max hold time <0-60000>  
Maximum hold time

**Example** Switch(config)# **ospf**  
Switch(config-ospf-1)#**timers throttle spf 10 100 10000**

---

## refresh timer

---

**Syntax** refresh timers <10-1800>

no refresh timers

---

**Parameter** <10-1800> timer is 10 to 1800 second

---

**Default** default 10 second

---

**Mode** ospf configuration mode.

---

**Usage** Run the refresh timers 100 command to set the refresh time 100 of OSPF process 1.  
Refresh time <0-60000>  
Interval for refreshing routes

**Example** Switch(config)# **ospf**  
Switch(config-ospf-1)#**refresh timers 100**

---

## auto-cost reference-bandwidth

---

**Syntax** auto-cost reference-bandwidth <1-4294967>

no auto-cost reference-bandwidth

---

---

|                  |                                                                                                                                                                         |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Parameter</b> | <1-4294967>Reference bandwidth in megabits per second. The value ranges from 1 to 4294967                                                                               |
| <b>Default</b>   | bandwidth 100000                                                                                                                                                        |
| <b>Mode</b>      | ospf configuration mode.                                                                                                                                                |
| <b>Usage</b>     | Run the "auto-cost reference-bandwidth" command to configure the reference bandwidth of OSPF process 1.                                                                 |
| <b>Example</b>   | Set the reference bandwidth of OSPF process 1 to 1000000 (1000M).<br>Switch(config)# <b>ospf</b><br>Switch(config-ospf-1)# <b>auto-cost reference-bandwidth 1000000</b> |

---

## default-metric

---

|                  |                                                                                                                                                |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>default-metric &lt;0-16777214&gt;</b><br><br><b>no default-metric</b>                                                                       |
| <b>Parameter</b> | <0-16777214> Set the default metric for importing routes. ranges from 0 to 16777214                                                            |
| <b>Default</b>   | Default metric 20                                                                                                                              |
| <b>Mode</b>      | ospf configuration mode.                                                                                                                       |
| <b>Usage</b>     | Run the "default-metric" command to configure the reference bandwidth of OSPF process 1.                                                       |
| <b>Example</b>   | When OSPF process 1 imports routes, the default metric is 30<br>Switch(config)# <b>ospf</b><br>Switch(config-ospf-1)# <b>default-metric 30</b> |

---

## passive-interface vlan-interface

---

|               |                                                        |
|---------------|--------------------------------------------------------|
| <b>Syntax</b> | <b>passive-interface vlan-interface &lt;1-4094&gt;</b> |
|---------------|--------------------------------------------------------|

**no passive-interface vlan-interface**

---

|                  |                                                                                                                                                                           |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Parameter</b> | <1-4094>,Vlan interface. The value ranges from 1 to 4094                                                                                                                  |
| <b>Default</b>   | no                                                                                                                                                                        |
| <b>Mode</b>      | ospf configuration mode.                                                                                                                                                  |
| <b>Usage</b>     | Run the "passive-interface vlan-interface" command to configure the mode of OSPF process 1 on a specific interface and use it with the passive interface default command. |
| <b>Example</b>   | Configure VLAN interface 1 of OSPF process 1 not to send Hello packets<br>Switch(config)# <b>ospf</b><br>Switch(config-ospf-1)# <b>passive-interface vlan-interface 1</b> |

---

**passive-interface default**

---

|                  |                                                                                                                                                                 |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>passive-interface default</b><br><b>no passive-interface default</b>                                                                                         |
| <b>Parameter</b> | no                                                                                                                                                              |
| <b>Default</b>   | The default passive interface mode is disabled by default                                                                                                       |
| <b>Mode</b>      | ospf configuration mode.                                                                                                                                        |
| <b>Usage</b>     | Run the "passive interface default" command to configure the default interface mode of OSPF process 1.                                                          |
| <b>Example</b>   | Configure the default interface of OSPF process 1 to the passive mode<br>Switch(config)# <b>ospf</b><br>Switch(config-ospf-1)# <b>passive-interface default</b> |

---

**area**

---

|                  |                                                                                                                                                                             |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <code>area (A.B.C.D &lt;0-4294967295&gt;)</code><br><br><code>no area (A.B.C.D &lt;0-4294967295&gt;)</code>                                                                 |
| <b>Parameter</b> | A.B.C.D area identifier in the format of an IP address<br><br>The value is a decimal integer ranging from 0 to 4294967295. The system processes the value as an IP address. |
| <b>Default</b>   | no                                                                                                                                                                          |
| <b>Mode</b>      | ospf configuration mode.                                                                                                                                                    |
| <b>Usage</b>     | Run the "area" command to configure the area of OSPF process 1 and enter the area mode                                                                                      |
| <b>Example</b>   | Configure area 0 of OSPF process 1 and enter the area mode<br>Switch(config)# <b>ospf</b><br>Switch(config-ospf-1)# <b>area 0</b><br>Switch(config-ospf-1-area-0.0.0.0)#    |

---

## network

---

|                  |                                                                                                                                  |
|------------------|----------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <code>network A.B.C.D/M</code><br><code>no network A.B.C.D/M</code>                                                              |
| <b>Parameter</b> | A.B.C.D/M Network address and mask                                                                                               |
| <b>Default</b>   | By default, the interface does not belong to any area and the OSPF function is disabled.                                         |
| <b>Mode</b>      | Area Configuration Mode                                                                                                          |
| <b>Usage</b>     | Run the "network A.B.C.D/M" command to enable OSPF on each network interface of the device in the OSPF area to which it belongs. |

**Example** Specify the IP address of the interface 10.1.1.0/24. Run OSPF in area 0.  
Switch(config)# **ospf**  
Switch(config-ospf-1)# **area 0**  
Switch(config-ospf-1-area-0.0.0.0)# **network 10.1.1.0/24**

---

## default-cost

**Syntax** **default-cost <0-16777215>**  
**no default-cost**

**Parameter** Cost range <0-16777215>

**Default** default cost is 1

**Mode** Area Configuration Mode

**Usage** Run the "default-cost <0-16777215>" command to set the default cost of the imported default route in the stub/NSSA area. This command applies only to the ABR routers connected to the stub area or NSSA area.

**Example** The default cost for area 1 is 10.  
Switch(config)# **ospf**  
Switch(config-ospf-1)# **area 1**  
Switch(config-ospf-1-area-0.0.0.1)#**default-cost 10**

---

## authentication

**Syntax** **authentication [message-digest]**  
**no authentication**

**Parameter** message-digest MD5 authentication mode: This parameter is optional. If this parameter is not selected, the simple authentication mode is adopted (the password is in plain text).

**Default** disable

**Mode** Area Configuration Mode



---

**Usage**

Use the "authentication" command to configure the authentication mode for OSPF packets in an OSPF area.

**Example**

```
Configure OSPF area 0 to use MD5 authentication
Switch(config)# ospf
Switch(config-ospf-1)# area 0
Switch(config-ospf-1-area-0.0.0.0)#authentication message-digest
```

---

## ospf authentication

---

**Syntax**

```
ospf authentication [(null | message-digest)]
no ospf authentication
```

---

**Parameter**

message-digest MD5 authentication mode: This parameter is optional. If this parameter is not selected, the simple authentication mode is adopted (the password is in plain text).  
Null Null indicates no authentication

---

---

**Default**

The authentication function is disabled by default

---

**Mode**

Layer 3 interface configuration mode

---

**Usage**

Run the ospf authentication command to configure the interface to authenticate OSPF packets and the authentication mode.  
Using the ospf authentication null and no ospf authentication commands, you can cancel the configured authentication mode on an interface.

---

**Example**

```
Configure plaintext authentication for VLANIF1
Switch(config)# interface vlan 1
Switch(config-if-vlan1)# ospf authentication
```

---

## ospf authentication-key

---

**Syntax**

```
ospf authentication-key WORD<1-64>
no ospf authentication-key
```

---

---

|                  |                                                                                                                                                            |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Parameter</b> | Word <1-64>-Plaintext authentication password                                                                                                              |
| <b>Default</b>   | By default, no authentication password is configured                                                                                                       |
| <b>Mode</b>      | Layer 3 interface configuration mode                                                                                                                       |
| <b>Usage</b>     | Run the ospf authentication-key command to configure the plaintext password for the interface to authenticate OSPF packets.                                |
| <b>Example</b>   | Configure plaintext authentication for VLANIF1<br>Switch(config)# <b>interface vlan 1</b><br>Switch(config-if-vlan1)# <b>ospf authenticatio-key 123456</b> |

---

## ospf authentication-digest-key

---

|                  |                                                                                                                                                                            |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>ospf authentication-digest-key &lt;1-255&gt; md5 WORD&lt;1-64&gt;</b><br><b>no ospf authentication-digest-key &lt;1-255&gt;</b>                                         |
| <b>Parameter</b> | <1-255> Key value for MD5 encryption authentication<br>Word MD5 authentication password                                                                                    |
| <b>Default</b>   | By default, MD5 authentication is not configured                                                                                                                           |
| <b>Mode</b>      | Layer 3 interface configuration mode                                                                                                                                       |
| <b>Usage</b>     | Run the ospf authentication-digest-key command to configure the MD5 key value and password for the interface to authenticate OSPF packets.                                 |
| <b>Example</b>   | Configure the MD5 key and password for VLANIF1<br>Switch(config)# <b>interface vlan 1</b><br>Switch(config-if-vlan1)# <b>ospf authenticatio-digest -key 1 md5 password</b> |

---

## ospf cost

---

|               |                                  |
|---------------|----------------------------------|
| <b>Syntax</b> | <b>ospf cost &lt;1-65535&gt;</b> |
|---------------|----------------------------------|

**no ospf cost**

---

|                  |                                                                                                                               |
|------------------|-------------------------------------------------------------------------------------------------------------------------------|
| <b>Parameter</b> | <1-65535> The path cost ranges from 1 to 65535                                                                                |
| <b>Default</b>   | The default path cost is 10.                                                                                                  |
| <b>Mode</b>      | Layer 3 interface configuration mode                                                                                          |
| <b>Usage</b>     | Run the "ospf cost" command to set the cost for running OSPF on the interface.                                                |
| <b>Example</b>   | Set the path cost of VLANIF1 to 20<br>Switch(config)# <b>interface vlan 1</b><br>Switch(config-if-vlan1)# <b>ospf cost 20</b> |

---

## ospf priority

---

|                  |                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>ospf priority &lt;0-255&gt;</b><br><b>no ospf priority</b>                                                                                                                                                                                                                                                                                                                                     |
| <b>Parameter</b> | DR priority of the interface. The value ranges from 0 to 255                                                                                                                                                                                                                                                                                                                                      |
| <b>Default</b>   | The DR priority of the default interface is 1                                                                                                                                                                                                                                                                                                                                                     |
| <b>Mode</b>      | Layer 3 interface configuration mode                                                                                                                                                                                                                                                                                                                                                              |
| <b>Usage</b>     | Run the "ospf priority" command to set the cost of running OSPF on the interface.<br>The DR priority of an interface determines the qualification of the interface in DR/BDR election. A larger value indicates a higher priority. Those with higher priority are considered first when there is a conflict over voting rights. If the priority of a device is 0, it is not elected as DR or BDR. |
| <b>Example</b>   | Set the priority of VLANIF1 to 10<br>Switch(config)# <b>interface vlan 1</b><br>Switch(config-if-vlan1)# <b>ospf priority 10</b>                                                                                                                                                                                                                                                                  |

---

## ospf hello-interval

---

|                  |                                                                                                                                                                                 |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>ospf hello-interval &lt;1-65535&gt;</b><br><b>no ospf hello-interval</b>                                                                                                     |
| <b>Parameter</b> | <b>&lt;1-65535&gt; Interval for the interface to send Hello packets. The value ranges from 1 to 65535 seconds</b>                                                               |
| <b>Default</b>   | The default interval for the interface to send Hello packets is 10 seconds                                                                                                      |
| <b>Mode</b>      | Layer 3 interface configuration mode                                                                                                                                            |
| <b>Usage</b>     | Run the ospf hello-interval command to set the interval for sending Hello packets on the interface.                                                                             |
| <b>Example</b>   | The interval for the interface to send Hello packets was set to 30 seconds<br>Switch(config)# <b>interface vlan 1</b><br>Switch(config-if-vlan1)# <b>ospf hello-interval 30</b> |

---

## ospf dead-interval

---

|                  |                                                                                                                                                                          |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>ospf dead-interval &lt;1-65535&gt;</b><br><b>no ospf dead-interval</b>                                                                                                |
| <b>Parameter</b> | <b>&lt;1-65535&gt; The value ranges from 1 to 65535 seconds</b>                                                                                                          |
| <b>Default</b>   | By default, the failure time of OSPF neighbors on P2P and Broadcast interfaces is 40 seconds. The OSPF neighbor failure time of P2MP and NBMA interfaces is 120 seconds. |
| <b>Mode</b>      | Layer 3 interface configuration mode.                                                                                                                                    |
| <b>Usage</b>     | Run the ospf dead-interval command to set the dead interval of the OSPF neighbor on the interface                                                                        |

**Example** The OSPF neighbor failure interval of the interface was set to 60 seconds  
Switch(config)# **interface vlan 1**  
Switch(config-if-vlan1)# **ospf dead-interval 60**

---

## ospf retransmit-interval

|                  |                                                                                                                                                                                      |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>ospf retransmit-interval &lt;1-65535&gt;</b><br><b>no ospf retransmit-interval</b>                                                                                                |
| <b>Parameter</b> | <1-65535>Interval for retransmitting LSA on an interface. The value ranges from 1 to 65535 seconds                                                                                   |
| <b>Default</b>   | By default, the interval for retransmitting LSA on the interface is 5 seconds.                                                                                                       |
| <b>Mode</b>      | Layer 3 interface configuration mode.                                                                                                                                                |
| <b>Usage</b>     | Run the ospf retransmit-interval command to set the interval for the OSPF neighbor to expire on the interface.                                                                       |
| <b>Example</b>   | The interval for retransmitting LSA on the interface was set to 10 seconds<br>Switch(config)# <b>interface vlan 1</b><br>Switch(config-if-vlan1)# <b>ospf retransmit-interval 10</b> |

---

## ospf transmit-delay

|                  |                                                                                                |
|------------------|------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>ospf transmit-delay &lt;1-65535&gt;</b><br><b>no ospf transmit-delay</b>                    |
| <b>Parameter</b> | <1-65535> Delay for transmitting LSA on an interface. The value ranges from 1 to 65535 seconds |
| <b>Default</b>   | By default, the delay for transmitting LSA on the interface is 1 second                        |
| <b>Mode</b>      | Layer 3 interface configuration mode.                                                          |

**Usage** Run the ospf transmit-delay command to set the time for the OSPF neighbor to become invalid on the interface

**Example** The delay for transmitting LSA on the interface was set to 2 seconds.  
Procedure  
Switch(config)# **interface vlan 1**  
Switch(config-if-vlan1)# **ospf transmit-delay 2**

---

## ospf network

|                  |                                                                                                                                                                                                                                                                   |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>ospf network</b><br><b>(broadcast non-broadcast point-to-multipoint point-to-point)</b><br><b>no ospf network</b>                                                                                                                                              |
| <b>Parameter</b> | Broadcast interface The OSPF network type is broadcast<br>Non-broadcast interface The OSPF network type is NBMA<br>Point-to-multipoint interface The OSPF network type is point-to-multipoint<br>Point-to-point interface The OSPF network type is point-to-point |
| <b>Default</b>   | The default network type of the interface is broadcast.                                                                                                                                                                                                           |
| <b>Mode</b>      | Layer 3 interface configuration mode.                                                                                                                                                                                                                             |
| <b>Usage</b>     | Run the ospf transmit-delay command to set the OSPF network type of the interface.                                                                                                                                                                                |
| <b>Example</b>   | The OSPF network type of the interface is set to point-to-point<br>Switch(config)# <b>interface vlan 1</b><br>Switch(config-if-vlan1)# <b>ospf point-to-point</b>                                                                                                 |

---

## ospf mtu-ignore

|                  |                                                     |
|------------------|-----------------------------------------------------|
| <b>Syntax</b>    | <b>ospf mtu-ignore</b><br><b>no ospf mtu-ignore</b> |
| <b>Parameter</b> | no                                                  |

**Default** The MTU needs to be checked by default.

---

**Mode** Layer 3 interface configuration mode.

---

**Usage** Run the "ospf mtu-ignore" command to configure the interface not to check the MTU size during DD exchange

**Example** The MTU size is not checked when the interface performs DD switching  
Switch(config)# **interface vlan 1**  
Switch(config-if-vlan1)# **ospf mtu-ignore**

---

## 40. RIP

### rip (Global)

---

**Syntax** **rip**  
**no rip**

---

**Parameter** no

---

**Default** disable

---

**Mode** global configuration.

---

**Usage** Run the "rip" command to enable and enter the RIP process.

**Example** Enable ERPS  
Switch(config)# **rip**  
Switch(config-rip)#

---

### network

---

**Syntax** **network A.B.C.D/M**

## **no network A.B.C.D/M**

---

|                  |                                                                                                                                                       |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Parameter</b> | A.B.C.D/M IPv4 Address Source and destination IPv4 address and mask                                                                                   |
| <b>Default</b>   | no                                                                                                                                                    |
| <b>Mode</b>      | rip configuration mode.                                                                                                                               |
| <b>Usage</b>     | Run the "rip" command to enable and enter the RIP process.                                                                                            |
| <b>Example</b>   | used to enable RIP on an interface on a specified network segment<br>Switch(config)# <b>rip</b><br>Switch(config-rip)# <b>network 192.168.2.10/24</b> |

---

## route

---

|                  |                                                                                                          |
|------------------|----------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>route A.B.C.D/M</b><br><b>no route A.B.C.D/M</b>                                                      |
| <b>Parameter</b> | A.B.C.D/M IPv4 Address Source and destination IPv4 address and mask                                      |
| <b>Default</b>   | no                                                                                                       |
| <b>Mode</b>      | rip configuration mode.                                                                                  |
| <b>Usage</b>     | Run the "route" command to Configuring RIP Routes                                                        |
| <b>Example</b>   | Configuring RIP Routes<br>Switch(config)# <b>rip</b><br>Switch(config-rip)# <b>route 192.168.10.2/24</b> |

---

## version

---

|               |                      |
|---------------|----------------------|
| <b>Syntax</b> | <b>version (1 2)</b> |
|---------------|----------------------|



---

|                  |                                                                                    |
|------------------|------------------------------------------------------------------------------------|
| <b>Parameter</b> | Specify the RIP version RIPv1 or RIPv2                                             |
| <b>Default</b>   | default RIPv1                                                                      |
| <b>Mode</b>      | rip configuration mode.                                                            |
| <b>Usage</b>     | Specify the RIP version RIPv1 or RIPv2                                             |
| <b>Example</b>   | Config RIP version is RIPv2<br>Switch(config)# rip<br>Switch(config-rip)#version 2 |

---

## distance

---

|                  |                                                                                                                             |
|------------------|-----------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>distance &lt;1-255&gt;</b><br><b>no distance</b>                                                                         |
| <b>Parameter</b> | <1-255> Effectively manage distance range 1-255                                                                             |
| <b>Default</b>   | The default is 120                                                                                                          |
| <b>Mode</b>      | rip configuration mode.                                                                                                     |
| <b>Usage</b>     | Effectively manage distance range                                                                                           |
| <b>Example</b>   | Specify RIP Specifies a management distance of 100<br>Switch(config)# <b>rip</b><br>Switch(config-rip)# <b>distance 100</b> |

---

## distance

---

|               |                                                                                       |
|---------------|---------------------------------------------------------------------------------------|
| <b>Syntax</b> | <b>distance &lt;1-255&gt; A.B.C.D/M</b><br><b>no distance &lt;1-255&gt; A.B.C.D/M</b> |
|---------------|---------------------------------------------------------------------------------------|

---

---

|                  |                                                                                                                                                              |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Parameter</b> | A.B.C.D/M IPv4 Address Source and destination IPv4 address and mask<br><1-255> Effectively manage distance range 1-255                                       |
| <b>Default</b>   | no                                                                                                                                                           |
| <b>Mode</b>      | rip configuration mode.                                                                                                                                      |
| <b>Usage</b>     | Specify RIP Specifies a network address for the management distance                                                                                          |
| <b>Example</b>   | Config specify a management distance 100 network address for the specified<br>RIP<br>Switch(config)# rip<br>Switch(config-rip)#distance 100 192.168.10.12/24 |

---

## distribute-list

---

|                  |                                                                                                                                                                     |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>distribute-list WORD&lt;1-32&gt; (in out) interface vlan &lt;1-4094&gt;</b><br><b>no distribute-list WORD&lt;1-32&gt; (in out) interface vlan &lt;1-4094&gt;</b> |
| <b>Parameter</b> | WORD < 1-32 > 32 characters<br>In   out configuration into the direction or the direction<br><1-4094> Vlan ID                                                       |
| <b>Default</b>   | no                                                                                                                                                                  |
| <b>Mode</b>      | rip configuration mode.                                                                                                                                             |
| <b>Usage</b>     | config RIP distribution list.                                                                                                                                       |
| <b>Example</b>   | config RIP distribution list.<br>Switch(config)# rip<br>Switch(config-rip)#distribute-list test in interface vlan 1                                                 |

---

## access-list

---

|               |                                                                           |
|---------------|---------------------------------------------------------------------------|
| <b>Syntax</b> | <b>access-list WORD&lt;1-32&gt; (deny permit) A.B.C.D/M [exact-match]</b> |
|---------------|---------------------------------------------------------------------------|

---

---

**access-list WORD<1-32> (deny|permit) any**

**no access-list WORD<1-32> (deny|permit) A.B.C.D/M [exact-match]**

---

|                  |               |                                                                   |
|------------------|---------------|-------------------------------------------------------------------|
| <b>Parameter</b> | WORD < 1-32 > | 32 characters                                                     |
|                  | Deny   permit | denied or allowed                                                 |
|                  | A.B.C.D/M     | Source and destination IPv4 addresses and masks of IPv4 addresses |

---

---

**Default** no

---

**Mode** rip configuration mode.

---

**Usage** Run the "access-list" command to RIP an access list

**Example** Specify a RIP access list  
Switch(config)# rip  
Switch(config-rip)#access-list test deny 192.168.2.20/24

---

## show ip route rip

---

**Syntax** show ip route rip

---

**Parameter** No

---

---

**Default** no

---

**Mode** global configuration.

---

**Usage** Displaying RIP Information.

**Example** Displaying RIP Information  
Switch(config)# show ip route rip

---

## log

|                  |                                                                                                                                                     |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>log rip console</b><br><b>no log rip console</b><br><b>log rip file</b><br><b>no log rip file</b>                                                |
| <b>Parameter</b> | No                                                                                                                                                  |
| <b>Default</b>   | no                                                                                                                                                  |
| <b>Mode</b>      | global configuration mode.                                                                                                                          |
| <b>Usage</b>     | Run the log rip file command to enable RIP log output to a file<br><br>Run the log rip console command to enable outputting logs to the serial port |
| <b>Example</b>   | RIP syslog log<br>Switch(config)# log rip file<br>Switch(config)# log rip console                                                                   |

---

## 41. VRRP

### vrrp vrid

|                  |                                                                                                                                 |
|------------------|---------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>vrrp vrid vrid virtual-ip A.B.C.D</b><br><b>no vrrp vrid vrid virtual-ip A.B.C.D</b>                                         |
| <b>Parameter</b> | Vrid Backup group ID ranges from 1 to 5<br>A.B.C.D Indicates the virtual IP address                                             |
| <b>Default</b>   | no                                                                                                                              |
| <b>Mode</b>      | VLAN interface configuration mode                                                                                               |
| <b>Usage</b>     | Using this command, you can assign an IP address on a local network segment to a virtual switch (also known as a backup group). |

**Example** Configure a virtual group for VLAN interface 1 and set the virtual IP address to 192.168.1.1  
Switch(config-if-vlan1)# vrrp vrid 1 virtual-ip 192.168.1.1

---

## vrrp priority

|                  |                                                                                                                     |
|------------------|---------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>vrrp vrid vrid priority &lt;1-254&gt;</b><br><b>no vrrp vrid vrid priority</b>                                   |
| <b>Parameter</b> | Vrid Backup group ID ranges from 1 to 5<br><br><1-254> Priority range                                               |
| <b>Default</b>   | Priority 100                                                                                                        |
| <b>Mode</b>      | VLAN interface configuration mode.                                                                                  |
| <b>Usage</b>     | The value of priority ranges from 0 to 255 (a higher value indicates a higher priority).                            |
| <b>Example</b>   | Set the priority of the switch in backup group 1 to 200<br>Switch(config-if-vlan1)# <b>vrrp vrid 1 priority 200</b> |

---

## preempt-mode

|                  |                                                                                                                       |
|------------------|-----------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>vrrp vrid &lt;1-5&gt; preempt-mode [timer delay &lt;0-255&gt;]</b><br><b>no vrrp vrid &lt;1-5&gt; preempt-mode</b> |
| <b>Parameter</b> | Vrid Backup group ID ranges from 1 to 5<br>Delay <0-255> Preemption mode and delay of the backup group                |
| <b>Default</b>   | disable                                                                                                               |
| <b>Mode</b>      | VLAN interface configuration mode                                                                                     |

---

**Usage** Configure the preemption mode and delay of the backup group.

**Example** Configure the preemption mode and delay of the backup group  
Switch(config-if-vlan1)#**vrrp vrid 1 preempt-mode 1 timer delay 3**

---

## advertise

---

**Syntax** vrrp vrid <1-5> timer advertise <1-255>  
no vrrp vrid <1-5> timer advertise

---

**Parameter** Vrid Backup group ID ranges from 1 to 5  
Advertise <1-255> Configure the advertisement interval of the backup group

---

---

**Default** advertise default 1

---

**Mode** VLAN interface configuration mode.

---

**Usage** Set the notification interval for the backup group.

**Example** Set the notification interval of backup group 1 to 1 second  
Switch(config-if-vlan1)#**vrrp vrid 1 timer advertise 1**

---

## track

---

**Syntax** vrrp vrid <1-5> track vlan-interface <1-4094> [reduced <1-254>]  
no vrrp vrid <1-5> track vlan-interface <1-4094>

---

**Parameter** Vrid Backup group ID ranges from 1 to 5  
<1-4094> Indicates the VLAN ID of the interface  
<1-254> Priority reduction value range

---

---

**Default** no

---

**Mode** VLAN interface configuration mode.

**Usage** Priority reduction value range

**Example** Set monitoring interface of backup group 1 to VLAN interface 2, and set its priority reduction value to 20  
Switch(config-if-vlan1)#vrrp vrid 1 vlan-interface 2 reduced 20

---

## show

**Syntax** show vrrp [ vlan-interface <1-4094>]  
show vrrp vlan-interface <1-4094> vrid <1-5>

**Parameter** Vrid Backup group ID ranges from 1 to 5  
<1-4094> Indicates the VLAN ID of the interface

**Default** no

**Mode** global configuration.

**Usage** Displaying VRRP Information.

**Example** Displaying VRRP Information.  
Switch(config)#show vrrp

---

## 42. DHCP SERVER

### dhcp-server

**Syntax** dhcp-server  
no dhcp-server

**Parameter** no

|                |                                                          |
|----------------|----------------------------------------------------------|
| <b>Default</b> | disable                                                  |
| <b>Mode</b>    | global configuration.                                    |
| <b>Usage</b>   | The DHCP server was enabled or disabled                  |
| <b>Example</b> | Ebable DHCP server<br>Switch(config)# <b>dhcp-server</b> |

---

## dhcp-server group(global)

|                  |                                                                                                                       |
|------------------|-----------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>dhcp-server group &lt;1-256&gt; ip A.B.C.D</b><br><b>no dhcp-server group &lt;1-256&gt; ip</b>                     |
| <b>Parameter</b> | <1-256 > ID of a Dhcp server group<br>A.B.C.D Ipv4 address                                                            |
| <b>Default</b>   | no                                                                                                                    |
| <b>Mode</b>      | <b>global</b> configuration.                                                                                          |
| <b>Usage</b>     | Configure a DHCP server group.                                                                                        |
| <b>Example</b>   | Configure DHCP server group 1, IP address: 192.168.1.10<br>Switch(config)# <b>dhcp-server group 1 ip 192.168.1.10</b> |

---

## ip pool

|                  |                                                                                       |
|------------------|---------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>ip pool WORD&lt;1-32&gt;</b><br><b>no ip pool WORD&lt;1-32&gt;</b>                 |
| <b>Parameter</b> | WORD<1-32> Name of the Dhcp address pool. The value is a string of 1 to 32 characters |



|                |                                                                               |
|----------------|-------------------------------------------------------------------------------|
| <b>Default</b> | no                                                                            |
| <b>Mode</b>    | global configuration.                                                         |
| <b>Usage</b>   | The DHCP address pool name is specified.                                      |
| <b>Example</b> | The DHCP address pool name is 'test' .<br>Switch(config)# <b>ip-pool test</b> |

---

## gateway

|                  |                                                                                                                                  |
|------------------|----------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>gateway A.B.C.D/M</b><br><b>no gateway</b>                                                                                    |
| <b>Parameter</b> | A.B.C.D/M Gateway ipv4 address                                                                                                   |
| <b>Default</b>   | no                                                                                                                               |
| <b>Mode</b>      | Ip-pool Indicates the Ip address pool configuration mode.                                                                        |
| <b>Usage</b>     | The gateway address of the address pool was set.                                                                                 |
| <b>Example</b>   | The gateway address of address pool 1 on the DHCP server is specified<br>Switch(config-ip-pool-1)# <b>gateway 192.168.2.1/24</b> |

---

## section

|                  |                                                                                                                               |
|------------------|-------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>section &lt;1-8&gt; A.B.C.D A.B.C.D</b><br><b>no section &lt;1-8&gt;</b>                                                   |
| <b>Parameter</b> | <1-8> Session ids in the address pool range from 1 to 8<br>A.B.C.D A.B.C.D Address Pool Valid IP address range of the session |
| <b>Default</b>   | no                                                                                                                            |

---

**Mode** Ip-pool Indicates the Ip address pool configuration mode.

---

**Usage** The valid IP address of the address pool is specified.

**Example** Configure IP addresses 192.168.2.2 to 192.168.2.10 in address pool 1 of the DHCP server.  
Switch(config-ip-pool-1)#section 0 192.168.2.2 192.168.2.10

---

## dhcp-server group(if-vlan)

---

**Syntax** dhcp-server group <1-256>  
no dhcp-server group <1-256>

---

**Parameter** <1-256> Indicates the ID range of the interface configuration group

---

**Default** no

---

**Mode** VLAN interface configuration mode.

---

**Usage** The interface DHCP server group was configured.

**Example** The interface DHCP server group ID is set to 1.  
Switch(config-if-vlan1)#dhcp-server group 1

---

## show dhcp-server

---

**Syntax** show dhcp-server  
show dhcp-client

---

**Parameter** no

---

**Default** no

---

**Mode** global configuration.

**Usage** The DHCP server information is displayed  
The DHCP client information is displayed.

**Example** Displaying DHCP server Information.  
Switch(config)# **show dhcp-server**

DHCP server : enabled

interface dhcp server group ip  
Displaying DHCP client Information.

Switch(config)#**show dhcp-client**

dhcp-client bind table info:

| MAC Address    | ipAddress | VlanId | UserName |
|----------------|-----------|--------|----------|
| -----          | -----     | -----  | -----    |
| Total 0 entry. |           |        |          |

---

## 43. 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

---

|                  |                                                                           |
|------------------|---------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>ip domain name HOSTNAME</b><br><b>no ip domain name</b>                |
| <b>Parameter</b> | HOSTNAME Domain name character                                            |
| <b>Default</b>   | <b>no</b>                                                                 |
| <b>Mode</b>      | <b>global</b> configuration.                                              |
| <b>Usage</b>     | Run the ' <b>ip domain name</b> ' command to The domain name .            |
| <b>Example</b>   | Set The domain name is test<br>Switch(config)# <b>ip domain name test</b> |

---

## ip name-server

---

|                  |                                                                                                                                                                                                                                           |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>ip name-server (A.B.C.D X:X::X:X) [(A.B.C.D X:X::X:X)]</b><br><b>[(A.B.C.D X:X::X:X)] [(A.B.C.D X:X::X:X)]</b><br><b>no ip name-server (A.B.C.D X:X::X:X) [(A.B.C.D X:X::X:X)]</b><br><b>[(A.B.C.D X:X::X:X)] [(A.B.C.D X:X::X:X)]</b> |
| <b>Parameter</b> | A.B.C.D Ipv4 address<br>X:X::X:X Ipv6 address                                                                                                                                                                                             |
| <b>Default</b>   | <b>no</b>                                                                                                                                                                                                                                 |
| <b>Mode</b>      | <b>global</b> configuration.                                                                                                                                                                                                              |
| <b>Usage</b>     | Configure the available domain name servers.                                                                                                                                                                                              |
| <b>Example</b>   | Set the DNS server to 192.168.2.10.<br>Switch(config)# <b>ip name-server 192.168.2.10</b>                                                                                                                                                 |

---

## ip host

---

|                  |                                                                          |
|------------------|--------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>ip host HOSTNAME (A.B.C.D X:X::X:X)</b><br><b>no ip host HOSTNAME</b> |
| <b>Parameter</b> | 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 |

## 44. LOOPBACK

### loopback-detection

|                  |                                                                                                                                 |
|------------------|---------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>loopback-detection</b><br><b>no loopback-detection</b>                                                                       |
| <b>Parameter</b> | no                                                                                                                              |
| <b>Default</b>   | disable                                                                                                                         |
| <b>Mode</b>      | global configuration. Port configuration                                                                                        |
| <b>Usage</b>     | The loopback-detection was enabled or disabled.                                                                                 |
| <b>Example</b>   | Enabling the loopback-detection<br>Switch(config)# loopback-detection<br>Switch(config-if-GigabitEthernet1)# loopback-detection |

### loopback-detection control-vlan all

|                  |                                                                                             |
|------------------|---------------------------------------------------------------------------------------------|
| <b>Syntax</b>    | <b>loopback-detection control-vlan all</b><br><b>no loopback-detection control-vlan all</b> |
| <b>Parameter</b> | no                                                                                          |
| <b>Default</b>   | enable                                                                                      |
| <b>Mode</b>      | global configuration.                                                                       |
| <b>Usage</b>     | The loopback control vlan was enabled or disabled.                                          |

**Example**      the loopback control vlan all  
Switch(config)# loopback-detection control-vlan all

---

## loopback-detection detection-time <1-32767>

**Syntax**            loopback-detection detection-time <1-32767>

---

**Parameter**        no

---

**Default**            5seconds

---

**Mode**                global configuration.

---

**Usage**                Set loopback send packet interval.

**Example**            Set loopback send packet 10 seconds.  
Switch(config)# loopback-detection detection-time 10

---

## loopback-detection resume-time <10-65535>

**Syntax**            loopback-detection resume-time <10-65535>

---

**Parameter**        no

---

**Default**            30 seconds

---

**Mode**                global configuration.

---

**Usage**                Set loopback send auto resume time.

**Example** Set loopback send auto resume time 20 seconds.  
Switch(config)# loopback-detection resume-time 20

---

## loopback-detection resume-mode (automation|manual)

**Syntax** loopback-detection resume-mode (automation|manual)

---

**Parameter** no

---

**Default** automation

---

**Mode** global configuration.

---

**Usage** Set loopback send resume mode.

**Example** Set loopback send resume mode to manual.  
Switch(config)# loopback-detection resume-mode manual

---

## loopback-detection resume enable

**Syntax** loopback-detection resume enable

---

**Parameter** no

---

**Default** no

---

**Mode** global configuration.

---

**Usage** Set loopback Immediate recovery.  
notice:loopback resume mode must is manual



**Example** Set loopback Immediate recovery.  
Switch(config)# loopback-detection resume-mode manual  
Switch(config)# loopback-detection resume enable

---

## loopback-detection resume-check

|               |                                                                       |
|---------------|-----------------------------------------------------------------------|
| <b>Syntax</b> | loopback-detection resume-check<br>no loopback-detection resume-check |
|---------------|-----------------------------------------------------------------------|

|                  |    |
|------------------|----|
| <b>Parameter</b> | no |
|------------------|----|

|                |         |
|----------------|---------|
| <b>Default</b> | disable |
|----------------|---------|

|             |                       |
|-------------|-----------------------|
| <b>Mode</b> | global configuration. |
|-------------|-----------------------|

|              |                                        |
|--------------|----------------------------------------|
| <b>Usage</b> | Set loopback resume Advance detection. |
|--------------|----------------------------------------|

**Example** Set loopback resume Advance detection..  
Switch(config)# loopback-detection resume-check

---

## show loopback-detection [interfaces IF\_PORTS]

|               |                                               |
|---------------|-----------------------------------------------|
| <b>Syntax</b> | show loopback-detection [interfaces IF_PORTS] |
|---------------|-----------------------------------------------|

|                  |                                   |
|------------------|-----------------------------------|
| <b>Parameter</b> | [interfaces IF_PORTS] port number |
|------------------|-----------------------------------|

|                |    |
|----------------|----|
| <b>Default</b> | no |
|----------------|----|

|             |                       |
|-------------|-----------------------|
| <b>Mode</b> | global configuration. |
|-------------|-----------------------|

|              |                                 |
|--------------|---------------------------------|
| <b>Usage</b> | display loopback configuration. |
|--------------|---------------------------------|

**Example**

```
display loopback port 1 configuration.
Switch(config)# show loopback-detection interfaces GigabitEthernet 1
Loopback-detection gloabl Configs
```

```

Proto status :enable
Resume check status :disable
Detection period : 5
Restore time : 30
Control Vlan All : yes
```

```

Port : gi1
Enable : Enabled
Port Status : Forwards
Resume-mode : Automation

```

---