Command Line Interface

Managed Switch Software

USER GUIDE

Rev. 1.4

USING THIS DOCUMENT

This document is intended for the software engineer’s general information on the usage of switch source files for the chip development of the switch team.

Though every effort has been made to ensure that this document is current and accurate, more information may have become available subsequent to the production of this guide.

REVISION HISTORY

Revision	Release Date	Summary
1.0	2019-07-19	First draft
1.1	2019-08-31	Add Static routing and poe function
1.2	2020-11-16	Add the command line of USB interface function of layer 3 management switch series
1.3	2021-03-20	Add DHCP server function command line
1.4	2022-05-25	Add RIP and OSPF command line

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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

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

Default

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

Mode

Global Configuration

Usage

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

Both of them support following authenticate methods.

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

Parameter

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

Default

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

Mode

Global Configuration

Usage

Different access methods are allowed to bind different login authentication lists.
Use “ip (http | https) login authentication” command to bind the list to WEBUI access from http or https.
Use no form to bind the “default” list back.

Example

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

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

This example shows how to show line binding lists.

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

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

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
```

tacacs default-config

Syntax

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

Parameter

Key *TACACSKEY*	Specify default tacacs+ server key string
timeout *<1-30>*	Specify default tacacs+ server timeout value

Default

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

Mode

Global Configuration

Usage

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

Example

This example shows how modify default tacacs+ configuration

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

This example shows how to show default tacacs+ configurations.

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

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

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

tacacs host

Syntax

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

Parameter

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

Default

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

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

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 default-config

Syntax

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

Parameter

key *RADIUSKEY*	Specify default radius server key string

retransmit *<1-10>*	Specify default radius server retransmit value
timeout *<1-30>*	Specify default radius server timeout value

Default

Default radius key is “”.
Default radius retransmit is 3 times. Default
radius timeout is 3 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.

```
Retries| Timeout|   Key
--------+--------+---------
5    |       20      | radiuskey radius host
```

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

Default

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 typeall
```

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

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
```

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

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

```
Switch(config)# mac acl test
Switch(mac-al)# show acl
        MAC access list test
```

permit (MAC)

Syntax

[sequence <1-2147483647>] permit (A:B:C:D:E:F/A:B:C:D:E:F|any) (A:B:C:D:E:F/A:B:C:D:E:F|any) [vlan <1-4094>] [cos <0-7> <0-7>] [ethtype <0x0600-0xFFFF>]

no sequence <1-2147483647>

Parameter

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

	and mask of packet.
[ethtype <0x0600-0xFFFF>]	(Optional) Specify Ethernet protocol number of packet

Default

No default 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

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

deny (MAC)

Syntax

[**sequence** <1-2147483647>] **deny** (A:B:C:D:E:F/A:B:C:D:E:F|any) (A:B:C:D:E:F/A:B:C:D:E:F|any) [**vlan** <1-4094>] [**cos** <0-7> <0-7>] [**ethtype** <0x0600-0xFFFF>]

```
[shutdown] no sequence <1-2147483647>
```

Parameter

<1-2147483647>	(Optional) Specify sequenceindex 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.
[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

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

```
Switch(config)#ip acl iptest
Switch(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** | **drip** | *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 destination 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*]]

[**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*]

[**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*]

[**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*]

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 destination 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

```
Switch(config)#ipv6 acl ipv6test
Switch(ipv6-al)# show acl
  IPv6 access list iptes
```

Permil(IPv6)

Syntax

[**sequence** *<1-2147483647>*] **permit** (*<0-255>* | **ipv6**) (*X:X::X:X* / *<0-128>* | **any**) (*X:X::X:X* / *<0-128>* | **any**)[(**dscp** | **precedence**) *VALUE*]
[**sequence** *<1-2147483647>*] **permit icmp** (*X:X::X:X* / *<0-128>* | **any**)(*X:X::X:X* / *<0-128>* | **any**) (*<0-255>* | **destination-unreachable|packet-too-big|time-exceeded** | **parameter-problem|echo-request|echo-reply** | **mld-query** | **mld-report** | **mldv2-report|mld-done** | **router-solicitation** | **router-advertisement** | **nd-ns** | **nd-na** | **any**) (*<0-255>* | **any**)[(**dscp** | **precedence**) *VALUE*]
[**sequence** *<1-2147483647>*] **permit tcp** (*X:X::X:X* / *<0-128>* | **any**) (*<0-65535>* | **echo** | **discard** | **daytime** | **ftp-data** | **ftp** | **telnet** | **smtp** | **time** | **hostname** | **whois** | **tacacs-ds** | **domain** | **www** | **pop2** | **pop3** | **syslog** | **talk** | **klogin** | **kshell** | **sunrpc** | **drip** | *PORT_RANGE* | **any**) (*X:X::X:X* / *<0-128>* | **any**) (*<0-65535>* | **echo** | **discard** | **daytime** | **ftp-data** | **ftp** | **telnet** | **smtp** | **time** | **hostname** | **whois** | **tacacs-ds** | **domain** | **www** | **pop2** | **pop3** | **syslog** | **talk** | **klogin** | **kshell** | **sunrpc** | **drip** | *PORT_RANGE* | **any**) [**match-all** *TCP_FLAG*] [(**dscp** | **precedence**) *VALUE*]
[**sequence** *<1-2147483647>*] **permit udp** (*X:X::X:X* / *<0-128>* | **any**)(*<0-65535>* | **echo** | **discard** | **time** | **nameserver** | **tacacs-ds** | **domain** | **bootps** | **bootpc** | **tftp** | **sunrpc** | **ntp** | **netbios-ns** | **snmp** | **snmptrap** | **who** | **syslog** | **talk** | **rip** | *PORT_RANGE* | **any**) (*X:X::X:X* / *<0-128>* | **any**) (*<0-65535>* | **echo** | **discard** | **time** | **nameserver** | **tacacs-ds** | **domain** | **bootps** | **bootpc** | **tftp** | **sunrpc** | **ntp** | **netbios-ns** | **snmp** | **snmptrap** | **who** | **syslog** | *PORT_RANGE* | **any**) [(**dscp** | **precedence**) *VALUE*]
no sequence *<1-2147483647>*

Parameter

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

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]
[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]
[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]
[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 \"+\".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

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

Default

No default is defined

Mode

Interface Configuration

Usage

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

Example

The example shows how to bind an existed ACL to interface.

```
switch(config)# interface fa1
switch(config-if)# mac acl test
switch(config-if)# do show running-config interfaces fa1
      interface fa1 mac acl test
```

show acl

Syntax

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

Parameter

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

Default

No default is defined

Mode

Global Configuration

Context Configuration

Usage

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

Example

The example shows how to show all IP ACL.

```
Switch(config)# show ip acl
IP access list iptest
      sequence 1 deny ip 192.168.1.80/255.255.255.255 any
```

show acl utilization

Syntax

show acl utilization

Parameter

None

Default

No default is defined

Mode

Global Configuration

Usage

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

Example

The example shows how to show utilization

```
Switch(config-if)# do show acl utilization
Type: sys                    usage: 128
Type: mac ACL           usage: 128
Type: IPv4 ACL          usage: 128
Type: IPv6 ACL    usage: 128
```

3.Administration

configure

Syntax

configure

Parameter

Default

No default value for this command.

Mode

Privileged EXEC

Usage

Use “**configure**” command to enter global configuration mode. In global configuration mode, the prompt will show as “**Switch(config)#**”.

Example

This example shows how to enter global configuration mode.

```
Switch# configure
Switch(config)#
```

clear arp

Syntax

clear arp [*A.B.C.D*]

Parameter

A.B.C.D	Specify specific arp entry to clear.

Default

No default value for this command.

Mode

User EXEC
Privileged EXEC

Usage

Use “**clear arp**” command to clear all or specific one arp entry.

Example

This example shows how to clear all arp entries.

```
Switch(config)# clear arp
```

clear line

Syntax

clear line (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 line 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 line 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: admin
Current CLI Privilege: 15
```

This example show how to enter user EXEC mode with privilege 3.

```
Switch# disable 3
Switch> show privilege
Current CLI Username: admin
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 gi1
Switch(config-if)# end
Switch#
```

exit

Syntax

exit

Parameter

Default

No default value for this command.

Mode

User EXEC
Privileged EXEC
Global Configuration
Interface Configuration
Line Configuration

Usage

In User EXEC mode, “**exit**” command will close current CLI session. In other modes, “**exit**” command will go to the parent mode. And every mode has the “exit” command.

Example

This example shows how to enter privileged EXEC mode and use exit command to go back to user EXEC mode.

```
Switch> enable
Switch# exit
Switch>
```

history

Syntax

history *<1-256>*
no history

Parameter

<1-256>	Specify maximum CLI history entry number.

Default

Default maximum history entry number is 128.

Mode

Line Configuration

Usage

Use “**history**” command to specify the maximum commands history number for CLI running on console, telnet or ssh service. Every command input by user will record in history buffer. If all history commands exceed configured history number, older ones will be deleted from buffer.
Use “**no history**” to disable the history feature. And use “**show history**” to show all history commands.

Example

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

```
Switch(config)# line console
Switch(config-line)# history 100
Switch(config-line)# exit
Switch(config)# line telnet
Switch(config-line)# history 150
Switch(config-line)# exit
Switch(config)# line ssh
Switch(config-line)# history 200
Switch(config-line)# exit
```

This example shows how show line information.

```
Switch# show line
Console ================================
Session Timeout : 10 (minutes)
History Count        : 100 Password Retry    : 3
Silent Time    : 0 (seconds)
Telnet
=================================
Telnet Server: disabled Session Timeout : 10 (minutes) History Count : 150
Password Retry        : 3
Silent Time    : 0 (seconds)
SSH
===================================
SSH Server    : disabled Session Timeout : 10 (minutes) History Count : 200
Password Retry        : 3
Silent Time    : 0 (seconds)
```

This example shows how show history commands.

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

hostname

Syntax

hostname *WORD*

Parameter

WORD	Specify the hostname of the switch.

Default

Default name string is "Switch".

Mode

Global Configuration

Usage

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

Example

This example shows how to modify contact information

```
Switch(config)# hostname myname
myname(config)#
```

interface

Syntax

interface *IF_PORTS*
interface range *IF_PORTS*

Parameter

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

	……

Default

No default value for this command.

Mode

Global Configuration

Usage

Some configurations are port based. In order to configure these configurations, we need to enter Interface Configuration mode to configure them.
Use "**interface**" command to enter the Interface Configuration mode and select the port to be configured.
In Interface Configuration mode, the prompt will show as "**Switch(config- if)#**"

Example

This example shows how to enter Interface Configuration mode

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

ip address

Syntax

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

Parameter

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

Default

Default IP address is 192.168.1.1 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

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

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

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

```
Switch# show ip
IP Address: 192.168.1.200
Subnet Netmask: 255.255.255.0
Default Gateway: 192.168.1.254
```

ip default-gateway

Syntax

ip default-gateway *A.B.C.D*
no ip default-gateway

Parameter

A.B.C.D	Specify default gateway IPv4 address for switch

Default

Default IP address of default gateway is 192.168.1.254.

Mode

Global Configuration

Usage

Use “**ip default-gateway**” command to modify default gateway address. And use “**no ip default-gateway**” to restore default gateway address to factory default.

Example

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

```
Switch(config)# ip default-gateway 192.168.1.100
```

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

```
Switch# show ip
IP Address: 192.168.1.1
Subnet Netmask: 255.255.255.0
Default Gateway: 192.168.1.100
```

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

This example shows how to enable dhcp client.

```
Switch(config)# ip dhcp
```

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

```
Switch# show ip dhcp
DHCP Status : enabled
```

ip domain lookup

Syntax

ip domain lookup
no ip domain lookup

Parameter

Default

Default DNS lookup is enabled

Mode

Global Configuration

Usage

Use “**ip domain lookup**” command to enable the Domain Name to IP address service.

Example

This example enables the DNS service on the system.

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

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:fef1:4b3c/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:fef1:4b3c prefix 128
```

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

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

ipv6 default-gateway

Syntax

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

Parameter

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

Default

No default ipv6 default gateway address on the switch.

Mode

Global Configuration

Usage

Use “**ipv6 default-gateway**” command to modify default gateway IPv6 address.

Example

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

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

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

ipv6 dhcp

Syntax

ipv6 dhcp
no ipv6 dhc

Parameter

Default

Default DHCPv6 client is disabled.

Mode

Global Configuration

Usage

Use “**ipv6 dhcp**” command to enabled dhcpv6 client to get IP address from remote DHCPv6 server.
Use “**no ipv6 dhcp**” command to disabled dhcpv6 client and use static ipv6 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 name-server

Syntax

ip name-server *A.B.C.D [A.B.C.D]*
no ip name-server *A.B.C.D [A.B.C.D]*

Parameter

A.B.C.D	Specify the IP address of the DNS server

Default

Mode

Global Configuration

Usage

Use the command "IP name server" to specify the IP address of the DNS server.

Example

This example shows how to Configure DNS

```
Switch(config)# ip name-server 111.111.111.111 222.222.222.222
```

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

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

Parameter

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

Default

Default enable password for all privilege levels are “”.

Mode

Global Configuration

Usage

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

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

Example

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

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

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

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

Default

No default value for this command.

Mode

User EXEC
Privileged EXEC

Usage

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

Example

This example shows how to ping remote host 192.168.1.111.

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

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

traceroute

Syntax

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

Parameter

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

Default

No default value for this command.

Mode

User EXEC
Privileged EXEC

Usage

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

Example

This example shows how to trace route host 192.168.1.111.

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

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 silent time.

```
Switch(config)# line console
Switch(config-line)# silent-time 10
```

This example shows how show line information.

```
Console
===============================
Session Timeout : 10 (minutes)
History Count: 128
Password Retry          : 3
Silent Time     : 10 (seconds)
```

system name

Syntax

system name *NAME*

Parameter

NAME	Specify system name string.

Default

Default name string is “Switch”.

Mode

Global Configuration

Usage

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

Example

This example shows how to modify contact information

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

This example shows how to show system name information

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

system contact

Syntax

system contact *CONTACT*

Parameter

CONTACT	Specify contact string.

Default

Default contact string is “Default Contact”.

Mode

Global Configuration

Usage

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

Example

This example shows how to modify contact information

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

This example shows how to show system contact information

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

system location

Syntax

system location *LOCATION*

Parameter

CONTACT	Specify location string.

Default

Default location string is “Default Location”.

Mode

Global Configuration

Usage

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

Example

This example shows how to modify contact information

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

This example shows how to show system location information

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

terminal length

Syntax

terminal length *<0-24>*

Parameter

<0-24>	Specify terminal length value. 0 means no limit.

Default

Default terminal length is 24.

Mode

User EXEC
Privileged EXEC

Usage

Use "**terminal length**" command to specify the maximum line number the terminal is able to print.

Example

This example shows how to change terminal length.

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

username

Syntax

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

no username *WORD<0-32>*

Parameter

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

Default

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

Mode

Global Configuration

Usage

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

Example

This example shows how to add a new user account.

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

This example shows how to show existing user accounts.

```
Switch# show username
Priv | Type     |          User Name        |          Password
------+--------+--------------------+----------
01       | secret |                         | dnXencJRwfIV6
15       | secret |                admin | FzjrGO6vfbERY
15        | secret |                  test | 7p57T9yMkViSUS
```

show arp

Syntax

show arp

Parameter

Default

No default value for this command.

Mode

User EXEC
Privileged EXEC

Usage

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

Example

This example shows how to show arp entries.

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

show cpu utilization

Syntax

show cpu utilization

Parameter

Default

No default value for this command.

Mode

Privileged EXEC

Usage

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

Example

This example shows how to show current CPU utilization.

```
Switch# show cpu utilization
CPU utilization
---------------
Current: 30%
```

show history

Syntax

show history

Parameter

Default

No default value for this command.

Mode

User EXEC
Privileged EXEC
Global Configuration

Usage

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

Example

This example shows how show history commands.

```
Switch# show history
Maximun History Count: 100
-----------------------------------------------
1. enable
2. configure
4. line consoleexit
5. show history
6. line
7. exit
8. show history
9. configure
10. line
11. line console
12. exit
13. line console
14. history 100
15. exit
16. show history
17. exit
18. show history
```

show info

Syntax

show info

Parameter

Default

No default value for this command.

Mode

User EXEC
Privileged EXEC

Usage

Use “**show info**” command to show system summary information.

Example

This example shows how to show system version.

```
Switch# show info
```

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

show ip

Syntax

show ip

Parameter

Default

No default value for this command.

Mode

User EXEC
Privileged EXEC

Usage

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

Example

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

```
Switch# show ip
IP Address: 192.168.1.200
Subnet Netmask: 255.255.255.0
Default Gateway: 192.168.1.254
```

show ip dhcp

Syntax

show ip dhcp

Parameter

Default

No default value for this command.

Mode

User EXEC
Privileged EXEC

Usage

Use “**show ip dhcp**” command to show IPv4 dhcp client enable state.

Example

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

```
Switch# show ip dhcp
DHCP Status : enabled
```

show ip http

Syntax

show ip (**http**|**https**)

Parameter

Default

No default value for this command.

Mode

Privileged EXEC

Usage

Use “**show ip http**” command to show HTTP/HTTPS information.

Example

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

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

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

show ipv6

Syntax

show ipv6

Parameter

Default

No default value for this command.

Mode

User EXEC
Privileged EXEC

Usage

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

Example

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

```
Switch# show ipv6
###### Config ######
          State: enabled
    Auto Config: enabled
         DHCPv6: disabled
        Gateway: ::

###### Status ######
     IP Address: fe80::7a76:d9ff:fe0c:1af/64
Default Gateway: ::
```

show line

Syntax

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

Parameter

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

Default

No default value for this command.

Mode

Privileged EXEC

Usage

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

Example

This example shows how show all lines’ information.

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

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

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

show memory statistics

Syntax

show memory statistics

Parameter

Default

No default value for this command.

Mode

Privileged EXEC

Usage

Use “**show memory statistics**” command to show current memory utilization.

Example

This example show how to show current system memory statistics.

```
                    total(KB)        used(KB)        free(KB)      shared(KB)      buffer(KB)       cache(KB)
-------------------+------------+------------+------------+------------+------------
Mem:                126184         80368         45816            0            0            0
-/+ buffers/cache:                 80368         45816
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 privilege.

```
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
```

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.

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
```

This example shows how to show authentication

```
Autentication dot1x state : enabled Autentication mac state       :
enabled Autentication web state      : enabled
Guest VLAN   : enabled (3)
```

```
Mac-auth Radius User ID Format: XXXXXXXXXXXX
......................................
```

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.

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
```

The following example shows how to show authentication interface

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

authentication mac radius

Syntax

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

Parameter

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

Default

Default radius id format is upper case with none delimiter.

Mode

Global Configuration

Usage

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

Example

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

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

authentication mac local

Syntax

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

Parameter

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

Default

Default is no local MAC Authentication entry.

Mode

Global Configuration

Usage

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

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
```

The following example shows how to show authentication

```
Switch# show authentication
.....................................

Mac-auth Local Entry              :
Reauth                    Inactive MAC Address           Control          VLAN            Period Timeout
------------------- -------------- ------ ---------- ---------
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.

Example

The following example shows how to create guest VLAN.

```
Switch(config)# vlan 3
```

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.

Example

The following example shows how to enable guest VLAN.

```
Switch(config)# interface gi1
Switch(config-if)# authentication guest-vlan
```

authentication host-mode

Syntax

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

Parameter

multi-auth	Multiple Authentication Mode. In this mode, every client

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

Default

Default is multi-auth mode.

Mode

Interface Configuration

Usage

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

Example

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

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

authentication max-hosts

Syntax

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

Parameter

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

Default

Default max host number is 256

Mode

Interface Configuration

Usage

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

Example

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

```
Switch(config)# interface 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 port-control

Syntax

authentication port-control (**auto**|**force-auth**|**force-unauth**)

no authentication port-control

Parameter

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

Default

Default is disabled.

Mode

Interface Configuration

Usage

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

Example

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

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

clear authentication sessions

Syntax

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

Parameter

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

Default

Default is no local authentication entry.

Mode

Privileged EXEC

Usage

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

Example

The following example shows how to clear all authentication sessions.

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

show authentication

Syntax

show authentication
show authentication interfaces *IF_PORTS*

Parameter

interfaces *IF_PORTS*	Specify port list to show port configurations.

Default

No default value for this command.

Mode

Privileged EXEC

Usage

Use “**show authentication**” command to show all authentication manager configurations.
Use “**show authentication interface**” command to show authentication manager configuration of specific port.

Example

This example shows how to show the mac authentication configurations of port fa1.

```
Switch# show authentication
Autentication dot1x state      : enabled
Autentication mac state        : disabled
Autentication web state        : disabled
Guest VLAN  : disabled
Mac-auth Radius user ID Format: XXXXXXXXXXXX

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

Web-auth Local Entry           :
Reauth          Inactive
user Name       VLAN    Period  Timeout
------------------------------ ------ ---------- ---------
acct15          12345   333

Interface Configurations Interface GigabitEthernet1
```

```
Admin Control          : disable
Host Mode   : multi-auth
Type dot1x State       : disabled
Type mac State         : disabled
Type web State         : disabled
Type Order   : dot1x MAC/WEB
Method Order           : radius
Guest VLAN  : disabled
Reauthentication       : disabled
Max Hosts    : 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 g7
Interface ConfigurationsInterface GigabitEthernet7
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
```

show authentication sessions

Syntax

```
show authentication sessions [detail]
show authentication sessions interface IF_PORTS
show authentication sessions session-id WORD
```

show authentication session type (dot1x|mac|web)

Parameter

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

Default

No default value for this command.

Mode

Privileged EXEC

Usage

Use “**show authentication sessions**” command to show authentication detail session information.

Example

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

```
Switch# show authentication sessions
Interface    MAC Address        Type       Status          Session ID
---------- ----------------- ------- ---------------------------
Fa7          00:01:6C:CB:29:4A dot1x    Authorized      000000010000A028

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

```
Quiet Time          : N/A
```

5. Diagnostic

show cable-diag

Syntax

show cable-diag interfaces *IF_NMLPORTS*

Parameter

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

Default

Mode

Privileged EXEC

Usage

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

Example

The following example shows the result of cable diagnostic for the interface fa1 and fa2.

```
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
```

show fiber-transceiver

Syntax

show fiber-transceiver interfaces *IF_NMLPORTS*

Parameter

interfaces *IF_NMLPORTS*	Display the o diagnostic information of the fiber transceiver for an interface ID or a list of interface IDs.

Default

Mode

Privileged EXEC

Usage

To show the diagnostic information of the fiber transceiver use the command **show fiber-transceiver** in the Privilegeg EXEC mode.

Example

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

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

dhcp-client

Syntax

dhcp-client bind
dhcp-client *A:B:C:D:E:F A.B.C.D <1-4094> NAME*
no dhcp-client bind
no dhcp-client *A:B:C:D:E:F A.B.C.D <1-4094>*

Parameter

A:B:C:D:E:F	Client MAC address
A.B.C.D	IP address manually assigned to the client
<1-4094>	VLAN ID corresponding to the client
NAME	Name, character range 1-32

Default

Mode

Global Configuration

Usage

Use the command "DHCP client bind" to enable the static allocation function, so that the server can assign a specified IP address to a fixed client port. Note that the address used for static allocation needs to be within the range of IP address pool allocation.

Example

Enable static allocation function

```
switch(config)# dhcp-client bind
```

Configure static client table entries

```
switch(config-if)# dhcp-client 00:00:00:00:00:FE 172.168.1.200 172 MyPc
```

Query client list

```
switch# show dhcp-server clients
```

```
dhcp-client table info:
MAC Address              ipAddress              VlanId Hostname
-------------------- ----------------- ------ ----------------
00:00:00:00:00:FD      172.168.1.4            172       rbwww
00:00:00:00:00:FE      172.168.1.200          172       rbwww
```

dhcp-relay

Syntax

dhcp-relay
no dhcp-relay

Parameter

Default

Mode

Interface Configuration

Usage

Use the command "dhcp-relay" to enable port-level functionality of the DHCP server under the interface, noting that either the DHCP server functionality or the DHCP Relay function port group switch needs to be enabled.

Example

Enable DHCP Server Functions under Interface.

```
switch(config)# interface GigabitEthernet 1
switch(config-if)# dhcp-relay
```

dhcp-server

Syntax

dhcp-server
no dhcp-server

Parameter

Default

Mode

Global Configuration

Usage

Use the command "dhcp-server" to enable DHCP server global functionality.

Example

Enabling DHCP server functionality

```
switch(config)# dhcp-server
```

dhcp-server group (Global)

Syntax

dhcp-server group *<1-256>* **ip** *A.B.C.D*
no dhcp-server group *<1-256>* **ip**

Parameter

group	Number of DHCP Server Group

ip	IP Address of Server Group

Default

Mode

Global Configuration

Usage

Configure server groups using the command "dhcp-server group"

Example

Configure Server Groups

```
switch(config)# dhcp-server group 1 ip 172.168.1.1
```

dhcp-server group (Interface)

Syntax

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

Parameter

group	Number of DHCP Server Group

Default

Mode

VLAN Interface Configuration Mode

Usage

Use the command "DHCP server group" to establish the server group and interface relationship under the VLAN interface.

Example

Configure server group and VLAN interface relationships.

```
switch(config)# interface vlan 172
switch(config)# dhcp-server group 1
```

ip pool

Syntax

ip pool *WORD*
gateway *A.B.C.D/M*
lease *DD:HH:MM*
section *<1-8> A.B.C.D A.B.C.D*
no ip pool *WORD*
no gateway
no lease
no section

Parameter

WORD	Address pool name of the DHCP server
A.B.C.D/M	Gateway IP address and mask
DD:HH:MM	Lease term assigned to client address
<1-8>	IP address segment for dynamic allocation
A.B.C.D	Start IP and end IP for dynamic allocation

Default

Mode

Global Configuration

Usage

Use the command "IP pool" to configure the DHCP server address pool, including the assigned IP address segment, gateway, and lease term.

Example

Configure DHCP address pool ABC

```
switch(config)# ip pool abc
switch(config-ip-pool-abc)# gateway 172.168.1.1/24
switch(config-ip-pool-abc)# lease 0:12:0
switch(config-ip-pool-abc)# section 1 172.168.1.2 172.168.1.200
```

show dhcp-server clients

Syntax

show dhcp-server clients

Parameter

Default

Mode

Privileged EXEC

Usage

Use the command "show DHCP server clients" to query the list of DHCP clients.

Example

Query DHCP client list

```
switch# show dhcp-server clients
dhcp-client table info:
MAC Address          ipAddress          VlanId Hostname
-------------------- ------------------ ------ ----
00:00:00:00:00:FD    172.168.1.2        172    rbwww
```

7. DHCP Snooping

ip dhcp snooping

Syntax

ip dhcp snooping
no ip dhcp snooping

Parameter

Default

Mode

DHCP snooping is disabled

Usage

Use the ip dhcp snooping command to enable DHCP Snooping function.

Example

The example shows how to enable DHCP Snooping on VLAN 1. You can verify settings by the following show ip dhcp snooping command.

```
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)
```

ip dhcp snooping vlan

Syntax

ip dhcp snooping vlan VLAN-LIST

Parameter

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

Default

Default is disabled on all VLANs

Mode

Global Configuration

Usage

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

Example

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

```
switch(config)# exit
switch(config)# ip dhcp snooping
switch(config)# ip dhcp snooping vlan 1-100
switch(config)# show ip dhcp snooping
DHCP Snooping     : enabled
Enable on following Vlans           : 1-100
circuit-id default format : vlan-port
remote-id: 00:11:22:33:44:55 (Switch Mac in Byte Order)

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

ip dhcp snooping trust

Syntax

ip dhcp snooping trust
no ip dhcp snooping trust

Parameter

Default

DHCP snooping trust is disabled

Mode

Interface Configuration

Usage

Use the **ip dhcp snooping trust** command to set trusted interface. The switch does not check DHCP packets that are received on the trusted interface; it simply forwards it.

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

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    | Unrusted  | None          | disabled          | disabled          |
```

ip dhcp snooping rate-limit

Syntax

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

Parameter

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

Default

Default is un-limited of DHCP packet

Mode

Interface Configuration

Usage

Use the **ip dhcp snooping rate-limit** command to set rate limitation on interface. The switch drop DHCP packets after receives more than configured rate of packets per second.

Example

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

```
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            |
```

clear ip dhcp snooping statistics

Syntax

clear ip dhcp snooping interfaces IF_PORTS statistics

Parameter

IF_PORTS	specifies ports to clear statistics

Default

No default is defined

Mode

Privileged EXEC

Usage

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

Example

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

```
switch# clear ip dhcp snooping interfaces gi1 statistics
```

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

show ip dhcp snooping

Syntax

show ip dhcp snooping

Parameter

Default

No default is defined

Mode

Privileged EXEC

Usage

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

Example

The example shows how to show settings of DHCP Snooping

```
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)
```

8. DOS

dos

Syntax

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

Parameter

daeqsa-deny	Drops the packets if the destination MAC address is equal to the source MAC address.
icmp-frag-pkts-deny	Drops the fragmented ICMP packets.
icmpv4-ping-max- check	Checks the maximum size of ICMP ping packets, and drops the packets larger than the maximum packet size defined by the command **dos icmp-ping-max-length** *MAX_LEN*.
icmpv6-ping-max- check	Checks the maximum size of ICMPv6 ping packets, and drops the packets larger than the maximum packet size defined by the command **dos icmp-ping-max-length** *MAX_LEN*.
ipv6-min-frag- size-check	Checks the minimum size of IPv6 fragments, and drops

	the packets smaller than the minimum size defined by the command **dos ipv6-min-frag-size-length** *MIN_LEN*.
land-deny	Drops the packets if the source IP address is equal to the destination IP address.
nullscan-deny	Drops the packets with NULL scan.
pod-deny	Avoids ping of death attack.
smurf-deny	Avoids smurf attack.
syn-sportl1024-deny	Drops SYN packets with sport less than 1024.
synfin-deny	Drops the packets with SYN and FIN bits set.
synrst-deny	Drops the packets with SYN and RST bits set.
tcp-frag-off-min- check	Drops the TCP fragment packets with offset equals to one.
tcpblat-deny	Drops the packages if the TCP source port is equal to the TCP destination port.
tcphdr-min-check	Checks the minimum TCP header and drops the TCP packets with the header smaller than the minimum size defined by the command **dos tcphdr-min-length** *HDR_MIN_LEN*.
udpblat-deny	Drops the packets if the UDP source port equals to the UDP destination port.
xmas-deny	Drops the packets if the sequence number is zero, and the FIN, URG and PSH bits are set.
icmp-ping-max- length *MAX_LEN*	Specify the maximum size of the ICMPv4/ICMPv6 ping packets. The valid range is from 0 to 65535 bytes, and the default value is 512 bytes.
ipv6-min-frag- size-length *MIN_LEN*	Specify the minimum size of IPv6 fragments. The valid range is from 0 to 65535 bytes, and default value is 1240 bytes.
smurf-netmask *MASK*	Specify the netmask of smurf attack. The length range is from 0 to 323 bytes, and default length is 0 bytes.
tcphdr-min-length *HDR_MIN_LEN*	Specify the minimum TCP header length. The length range is from 0 to 31 bytes, and default length is 20 bytes.

Default

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

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

Mode

Global Configuration

Usage

To enable the specific Deniel of Service (DoS) protection, use the command **dos** in the Global Configuration mode. Otherwise.

Example

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

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

dos(interface)

Syntax

dos
no dos

Parameter

Default

DoS protection is disabled on each interface.

Mode

Interface Configuration

Usage

To enable the DoS on the specific interface, use the command **dos** in the Interface Configuration mode. Otherwise.

Example

The following example enables the DoS on the interface fa1.

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

show dos

Syntax

show dos
show dos interface IF_PORTS

Parameter

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

Default

Mode

Privileged EXEC

Usage

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

Example

The following example shows the global DoS protection configuration.

```
Switch# 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
```

9. Dynamic ARP Inspection

ip arp inspection

Syntax

ip arp inspection
no ip arp inspection

Parameter

Default

Dynamic Arp inspection is disabled

Mode

Global Configuration

Usage

Use the ip arp inspection command to enable Dynamic Arp Inspection function.

Example

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

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

ip arp inspection vlan

Syntax

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

Parameter

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

Default

Default is disabled on all VLANs

Mode

Global Configuration

Usage

Use the ip arp inspection vlan command to enable VLANs on Dynamic Arp Inspection function.

Example

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

```
switch(config)# vlan 1-100
switch(config)# exit
switch(config)# ip arp inspection
switch(config)# ip arp inspection vlan 1-100
switch(config)# show ip arp inspection
Dynamic ARP Inspection          : enabled
Enable on Vlans : 1-100
```

ip arp inspection trust

Syntax

ip arp inspection trust
no ip arp inspection trust

Parameter

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.

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

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.

Example

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

interface command.

```
switch(config)# interface gi1
switch(config-if)# ip arp inspection validate src-mac
switch(config-if)# ip arp inspection validate dst-ma
switch(config-if)# ip arp inspection validate ip allow-zeros
switch(config)# do show ip arp inspection interface gi1
Interfaces | Trust State | Rate (pps) | SMAC Check | DMAC Check | IP Check/Allow Zero
|
------------+--------------+--------------+----------------|-----------------+-------------------------+
gi1     | Untrusted  | None            | enabled| enabled| enabled/ enabled
```

ip arp inspection rate-limit

Syntax

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

Parameter

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

Default

Default is un-limited of ARP packet

Mode

Interface Configuration

Usage

Use the **ip arp inspection rate-limit** command to set rate limitation on interface. The switch drop ARP packets after receives more than configured rate of packets per second.

Example

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

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

clear ip arp inspection statistics

Syntax

clear ip arp inspection interfaces IF_PORTS **statistics**

Parameter

IF_PORTS	***specifies ports to clear statistics***

Default

No default is defined

Mode

Privileged EXEC

Usage

Use the clear ip arp inspection interfaces statistics command to clear statistics that are recorded on interface.

Example

The example shows how to clear statistics on interface gi1. You can verify settings by the following **show ip arp inspection interface statistics** command.

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

show ip arp inspection

Syntax

```
show ip dhcp snooping
```

Parameter

Default

No default is defined

Mode

Privileged EXEC

Usage

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

Example

The example shows how to show settings of Dynamic Arp Inspection

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

Dynamic ARP Inspection          : enabled

Enable on Vlans         1
```

show ip arp inspeciton interface

Syntax

```
show ip arp inspection interfaces IF_PORTS
show ip arp inspection interfaces IF_PORTS statistics
```

Parameter

IF_PORTS	specifies ports to show statistics

Default

No default is defined

Mode

Privileged EXEC

Usage

Use the **show ip arp inspection interfaces** command to show settings or statistics of interface.

Example

The example shows how to show settings of interface gi1.

```
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
```

The example shows how to show statistics of interface gi1.

```
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
```

10. GVRP

gvrp (Global)

Syntax

gvrp
no gvrp

Parameter

Default

GVRP is disabled

Mode

Global Configuration

Usage

Disable gvrp will clear all learned dynamic vlan entry and do not learn dynamic vlan anymore. Use ‘show gvrp’ to show configuration.

Example

The following example specifies that set global gvrp test.

```
Switch(config)# gvrp
 Switch# show gvrp
          GVRP      Status
              --------------------

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

gvrp (Interface)

Syntax

gvrp
no gvrp

Parameter

Default

GVRP is disabled on interface

Mode

Interface mode

Usage

'no gvrp' will remove dynamic port from vlan.
'gvrp' must work at port mode is trunk.

Example

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

```
Switch(config)#interface gi1
Switch(config-if)# switchport mode trunk
Switch(config)#gvrp
Switch# show gvrp configuration interfaces gi1
Port | GVRP-Status | Registration | Dynamic VLAN Creation
--------+---------------+---------------+---------------------
     gi1      Enabled        Normal        Disabled
```

gvrp registration-mode

Syntax

gvrp registration-mode (normal | fixed | forbidden)

Parameter

normal	register dynamic vlan, and transmit all vlan attribute.
fixed	do not register dynamic vlan, and only transmit static vlan attribute.
forbidden	do not register dynamic vlan, and only transmit default vlan attribute.

Default

Default is Normal

Mode

Interface mode

Usage

When set registration-mode is fixed or forbidden, will remove the port from vlan witch is dynamic port. And do not learning vlan.

Example

The following example specifies that set gvrp registration mode test.

```
Switch(config)# interface gi1
Switch(config-if)# gvrp registration-mode fixed
Switch# show gvrp configuration interfaces gi1
Port | GVRP-Status | Registration | Dynamic VLAN Creation
--------+---------------+---------------+---------------------
      gi1      Enabled         Fixed   Disabled
```

gvrp vlan-create-forbid

Syntax

gvrp vlan-creation-forbid
no gvrp vlan-creation-forbid

Parameter

Default

Default is disabled.

Mode

Interface mode

Usage

‘gvrp vlan-creation-forbid’ will not remove dynamic port from vlan immediate.

Example

The following example specifies that set port gvrp vlan-creation-forbid test.

```
Switch(config)#interface gi1
Switch(config-if)# gvrp vlan-creation-forbid
Switch(config-if)#exit
```

```
Switch# show gvrp configuration interfaces gi1
Port | GVRP-Status | Registration | Dynamic VLAN Creation
--------+---------------+---------------+---------------------
gi1        Enabled        Normal              Enabled
```

clear gvrp statistics

Syntax

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

Parameter

error-statistics	Error-statistics: error gvrp packet statistics
statistics	Statistics: gvrp event message
interfaces IF_PORTS	statistics Specifies posts to clear statistics

Default

Mode

Privileged EXEC

Usage

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

Example

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

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

show gvrp statistics

Syntax

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

Parameter

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

Default

Display all ports statistics info

Mode

Privileged EXEC

Usage

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

Example

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

```
Switch# show gvrp statistics
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 protocoal Id
INVATYP : Invalid Attribute Type
INVALEN : Invalid Attribute Length
INVAVAL : Invalid Attribute Value
INVEVENT: Invalid Event
Port | INVPROT | INVATYP | INVALEN | INVAVAL | INVEVENT
gi1        0        0        0        0    0
gi2        0        0        0        0    0
gi3        0        0        0        0    0
gi4        0        0        0        0    0
gi5        0        0        0        0    0
gi6              0                0                0                0          0
```

show gvrp

Syntax

show gvrp

Parameter

Default

Mode

Privileged EXEC

Usage

This command will display the gvrp global info.

Example

The following example specifies that display gvrp test.

```
Switch# show gvrp
GVRP        Status
-----------------------------

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

show gvrp configuration

Syntax

show gvrp configuration [interface IF_PORTS]

Parameter

none	Display all ports configuration
[interface IF_PORTS]	Display Specifies posts configuration

Default

Display all ports configuration info

Mode

Privileged EXEC

Usage

This command will display the ports configuration info.

Example

The following example specifies that display gvrp port configuration test.

```
Switch# show gvrp configuration
Port | GVRP-Status | Registration | Dynamic VLAN Creation
--------+---------------+---------------+----------------------
gi1   Disabled        Normal               Enabled
gi 2  Disabled        Normal          Enabled
```

11. IGMP Snooping

ip igmp snooping

Syntax

ip igmp snooping
no ip igmp snooping

Parameter

Default

Default is enabled

Mode

Global Configuration

Usage

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

Example

The following example specifies that set ip igmp snooping test.

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

ip igmp snooping version

Syntax

ip igmp snooping version (2|3)

Parameter

(2|3)	IGMP version 2 or IGMP version 3 basic mode

Default

Default is version 2

Mode

Global Configuration

Usage

Use the **ip igmp snooping version** command to change IGMP support version.
Only basic mode is supported in v3. When change version from v3 to v2, all querier version will update to version 2.
You can verify settings by the **show ip igmp snooping** command.

Example

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

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

ip igmp snooping querier

Syntax

ip igmp snooping vlan <VLAN-LIST> querier [version (2|3)]

no ip igmp snooping [vlan <VLAN-LIST>] querier

Parameter

VLAN-LIST	specifies VLAN ID list to set
(2|3)	Query version 2 or 3

Default

No ip igmp snooping querier by default

Mode

Global Configuration

Usage

When enable ip igmp vlan querier, there will process router select, the select successful will send general and specific query.
Use the **ip igmp snooping querier** command to add querier.

Example

The following example specifies that set ip igmp snooping querier test.

Switch(config)# **ip igmp snooping vlan 2 querier version 3**

ip igmp snooping vlan

Syntax

ip igmp snooping vlan VLAN-LIST
no ip igmp snooping vlan VLAN-LIST

Parameter

VLAN-LIST	specifies VLAN ID list to set

Default

Default is disabled for all VLANs

Mode

Global Configuration

Usage

Disable will clear all ip igmp snooping dynamic group and dynamic router port and make all static ip igmp group invalid of this vlan. Will not learn dynamic group and router port by igmp message any more.
Use the **ip igmp snooping vlan** command to enable IGMP on VLAN.

Example

The following example specifies that set ip igmp snooping vlan test.

```
Switch(config)# ip igmp snooping
Switch(config)# ip igmp snooping vlan 2
```

ip igmp snooping vlan fastleave

Syntax

ip igmp snooping vlan <VLAN-LIST> **fastleave**

no ip igmp snooping vlan <VLAN-LIST> **fastleave**

Parameter

VLAN-LIST	specifies VLAN ID list to set

Default

Default is disabled

Mode

Global Configuration

Usage

Use the **ip igmp snooping vlan fastleave** command to enable fastleave function. Group will remove port immediately when receive leave packet.

Example

The following example specifies that set ip igmp snooping vlan fastleave test.

```
Switch(config)# ip igmp snooping vlan 1 fastleave
```

ip igmp snooping vlan 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.

Example

The following example specifies that set **ip igmp snooping vlan query- interval** test.

```
Switch(config)# ip igmp snooping vlan 1 query-interval 100
```

ip igmp snooping vlan response-time

Syntax

ip igmp snooping vlan <VLAN-LIST> **response-time <5-20>**
no ip igmp snooping vlan <VLAN-LIST> **response-time**

Parameter

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

Default

Default is 10

Mode

Global Configuration

Usage

Use the **ip igmp snooping vlan response-time** command to set response time.

Example

The following example specifies that set **ip igmp snooping vlan response- time** test.

```
Switch(config)# ip igmp snooping vlan 1 response-time 12
```

ip igmp snooping vlan router

Syntax

ip igmp snooping vlan VLAN-LIST **router learn pim-dvmrp**

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

Parameter

VLAN-LIST	specifies VLAN ID list to set

Default

Default is enabled

Mode

Global Configuration

Usage

Use the **ip igmp snooping vlan router** command to enable learning router port by routing protocol packets such as PIM/PIMv2, DVMRP, MOSPF.

Example

The following example specifies that set **ip igmp snooping vlan router** test.

```
Switch(config)# ip igmp snooping vlan 99 router
```

ip igmp snooping vlan forbidden-port

Syntax

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

Parameter

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

Default

No forbidden ports by default

Mode

Global Configuration

Usage

'ip igmp snooping vlan 1 static-port gi1-2' will add static port gi1-2 for vlan 1.the all known vlan 1 ipv4 group will add the static ports.
'ip igmp snooping vlan 1 forbidden-port gi3-4' will add forbidden port gi3-4 for vlan 1.the all known vlan 1 ipv4 group will remove the forbidden ports. The configure can use 'show ip igmp snooping forward-all'.

Use the **ip igmp snooping vlan forbidden-port** command to add static non- forwarding port, all known vlan 1 ipv4 group will remove the forbidden ports.

Example

The following example specifies that set ip igmp snooping static/forbidden port test.

```
Switch(config)# ip igmp snooping vlan 1 forbidden -port gi3-4
```

ip igmp snooping vlan static-port

Syntax

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

Parameter

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

Default

No static port by default

Mode

Global Configuration

Usage

Use the **ip igmp snooping vlan static-port** command to add static forwarding port, all known vlan 1 ipv4 group will add the static ports.

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 static-router-port

Syntax

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

Parameter

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

Default

No forbidden 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.

Example

The following example specifies that set ip igmp snooping static test.

```
Switch(config)# ip igmp snooping vlan 1 static-router-port gi1-2
```

ip igmp snooping vlan static-group

Syntax

ip igmp snooping vlan <VLAN-LIST> static-group [<ip-addr>] interfaces IF_PORTS
no ip igmp snooping vlan <VLAN-LIST> static-group <ip-addr> interfaces IF_PORTS

Parameter

VLAN-LIST	specifies VLAN ID list to set
ip-addr	specifies multicast group ipv4 address
IF_PORTS	specifies port list to set or remove

Default

No static group by default

Mode

Global Configuration

Usage

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

Example

The following example specifies that set ip igmp snooping static group test.

```
Switch(config)# ip igmp snooping vlan 1 static-group 224.1.1.1 interfaces gi1-2
```

ip igmp snooping vlan group

Syntax

no ip igmp snooping vlan <VLAN-LIST> group <ip-addr>

Parameter

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

Default

Mode

Global Configuration

Usage

Use the **no ip igmp snooping vlan group** command to delete a group which could be static or dynamic.

Example

The following example specifies that set ip igmp snooping static group test.

```
Switch(config)# no ip igmp snooping vlan 1 group 224.1.1.1
```

ip igmp profile

Syntax

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

Parameter

<1-128>	specifies profile ID

Default

No profie exist by default

Mode

Global Configuration

Usage

Use the **ip igmp profile** command to enter profile configuration

Example

The following example specifies that set ip igmp profile test.
Switch(config)# **ip igmp profile 1**

profile range

Syntax

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

Parameter

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

Default

Mode

igmp profile configuration mode

Usage

Use the **profile** command to generate IGMP profile.

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 filter

Syntax

ip igmp filter <1-128>
[no] ip igmp filter

Parameter

<1-128>	specifies profile ID

Default

Mode

Port Configuration

Usage

Use the **ip igmp filter** command to bind a profile for port. When the port bind a profile. Then the port learning group will update, if the group is not match the profile rule it will remove the port from the group. Static group is excluded.

Example

The following example specifies that set ip igmp filter test.

```
Switch(config)# interface gi1
Switch(config-if)#ip igmp filter 1
```

ip igmp max-groups

Syntax

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

Parameter

<0-1024>	The maximum number of IGMP groups that an interface can join.

Default

Default is 1024

Mode

Port Configuration

Usage

Use the **ip igmp max-groups** command to limit port learning max group number. When the port has reach limitation, new group will not add this port. Static group is excluded.

Example

The following example specifies that set ip igmp max-groups test.

```
Switch(config-if)#ip igmp max-groups 10
```

ip igmp max-groups action

Syntax

ip igmp max-groups action (deny | replace)

Parameter

(deny | replace)	Deny: current port igmp group arrived max-groups,don't add group. Replace: current port igmp group arrived max-groups,remove port for rand group, and add port to new group.

Default

Default action is deny

Mode

Port Configuration

Usage

Use the **ip igmp max-groups action** command to set the action when the numbers of groups reach the limitation.

Example

The following example specifies that set action replace test.

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

clear ip igmp snooping groups

Syntax

clear ip igmp snooping groups [(dynamic | static)]

Parameter

none	Clear ip igmp groups include dynamic and static
(dynamic | static)	Ip igmp group type is dynamic or static

Default

Mode

Privileged EXEC

Usage

This command will clear the ip igmp groups for dynamic or static or all of type.
You can verify settings by the **show ip igmp snooping groups** command.

Example

The following example specifies that clear ip igmp snooping groups test.

```
Switch# clear ip igmp snooping groups
Switch# show ip igmp snooping groups
VLAN | Group IP Address | Type | Life(Sec) | Port
------+-----------------+--------+----------+-----------------
Total Number of Entry = 0
```

clear ip igmp snooping statistics

Syntax

clear ip igmp snooping statistics

Parameter

Default

Mode

Privileged EXEC

Usage

This command will clear the igmp statistics.
You can verify settings by the **show ip igmp snooping** command.

Example

The following example specifies that clear ip igmp snooping statistics test.

```
Switch# clear ip igmp snooping statistics
Switch# show ip igmp snooping
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

Default

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

Syntax

show ip igmp snooping groups [(dynamic | static)]

Parameter

none	Show ip igmp groups include dynamic and static
(dynamic | static)	Display Ip igmp group type is dynamic or static

Default

Mode

Privileged EXEC

Usage

This command will display the ip igmp groups for dynamic or static or all of type.

Example

The following example specifies that show ip igmp snooping groups.

```
Switch# show ip igmp snooping groups
```

```
VLAN | Group IP Address | Type | Life(Sec) | Port
------+------------------+--------+-----------+-----------------
1 |                 224.1.2.3 |  Static|     --| fa9
1 |                 224.1.2.4 |   Static|     --          | fa10

Total Number of Entry = 2
```

show ip igmp snooping router

Syntax

show ip igmp snooping router [(dynamic | forbidden |static)]

Parameter

none	Show ip igmp router include dynamic and static and forbidden
(dynamic |forbidden | static)	Display Ip igmp router info for different type

Default

Mode

Privileged EXEC

Usage

This command will display the ip igmp router info.

Example

The following example specifies that show ip igmp snooping router.

```
Switch# show ip igmp snooping router
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
```

show ip igmp snooping querier

Syntax

show ip igmp snooping querier

Parameter

none	Show all vlan ip igmp querier info.

Default

Mode

Privileged EXEC

Usage

This command will display all of the static vlan ip igmp querier info.

Example

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

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

        Total Entry 1
```

show ip igmp snooping

Syntax

show ip igmp snooping

Parameter

Default

Mode

Privileged EXEC

Usage

This command will display ip igmp snooping global info.

Example

The following example specifies that show ip igmp snooping test.

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

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

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

show ip igmp snooping vlan

Syntax

show ip igmp snooping vlan [VLAN-LIST]

Parameter

none	Show all ip igmp snooping vlan info
[VLAN-LIST]	Show specifies vlan ip igmp snooping info

Default

Mode

Privileged EXEC

Usage

This command will display ip igmp snooping vlan info.

Example

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

```
Switch# show ip igmp snooping vlan 1
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
```

show ip igmp snooping forward-all

Syntax

show ip igmp snooping forward-all [vlan VLAN-LIST]

Parameter

none	Show all ip igmp snooping vlan forward-all info
[vlan VLAN-LIST]	Show specifies vlan of ip igmp forward info.

Default

Mode

Privileged EXEC

Usage

This command will display ip igmp snooping forward all info.

Example

The following example specifies that show ip igmp snooping forward-all test.

```
Switch# show ip igmp snooping forward-all 1
```

```
IGMP Snooping VLAN1
IGMP Snooping static port          : None
IGMP Snooping forbidden port : None
```

show ip igmp profile

Syntax

show ip igmp profile [<1-128>]

Parameter

none	Show all ip igmp snooping profile info
[<1-128>]	Show specifies index profile info

Default

Mode

Privileged EXEC

Usage

This command will display ip igmp profile info.

Example

The following example specifies that show ip igmp profile test.

```
Switch# show ip igmp profile
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
```

show ip igmp filter

Syntax

show ip igmp filter [interfaces IF_PORTS]

Parameter

none	Show all port filter
[interfaces IF_PORTS]	Show specifies ports filter

Default

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

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

Syntax

show ip igmp max-group action [interfaces IF_PORTS]

Parameter

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

Default

Mode

Privileged EXEC

Usage

This command will display ip igmp port max-group action.

Example

The following example specifies that show ip igmp max-group action test.

```
Switch(config)#interface gi1
Switch(config-if)#ip igmp max-groups action replace
Switch# show ip igmp max-group action
Port ID | Max-groups Action
---------+---------------------
   gi1 : replace
   gi2 : deny
   gi3 : deny
   gi4 : deny
   gi5 : deny
   --More--
```

12. IP Source Guard

ip source verify

Syntax

ip source verify [mac-and-ip]

no ip source verify

Parameter

mac-and-ip	Verify by mac and ip address boundle

Default

IP Source Guard is disabled on interface. Default is that verifying ip address only

Mode

Port Configuration

Usage

Use the **ip source verify** command to enable IP Source Guard function. Default IP Source Guard filter source IP address. The “**mac-and-ip**” filters not only source IP address but also source MAC address.

Example

The example shows how to enable IP Source Guard with source IP address filtering on interface gi1.

```
Switch(config)# interface gi1
switch(config-if)# ip source verify
```

The example shows how to enable IP Source Guard with source IP and MAC address filtering on interface gi2.

```
Switch(config)# interface gi2
switch(config-if)# ip source verify mac-and-ip
switch(config-if)# do show ip source interfaces gi1-2
Port    |   Status      | Max Entry | Current Entry
-----------+----------------------+--------------+---------------
gi1 | Verify MAC+IP | No Limit | 0
gi2 | disabled | No Limit | 0
```

ip source binding

Syntax

ip source binding A:B:C:D:E:F vlan <1-4094> A.B.C.D interface IF_PORT
no ip source binding A:B:C:D:E:F vlan <1-4094> A.B.C.D interface IF_PORT

Parameter

A:B:C:D:E:F	Specify a MAC address of a binding entry
VLAN <1-4094>	Specify a VLAN ID of a binding entry
A.B.C.D	Specify IP address and MASK of a binding entry.
IF_PORT	Specify interface of a binding entry.

Default

Default is no binding entry.

Mode

Global Configuration

Usage

Use the **ip source binding** command to create a static IP source binding entry has an IP address, its associated MAC address、VLAN ID、interface.
Use the **no** form of this command to delete static entry.
You can verify settings by the **show ip source binding** command.

Example

The example shows how to add a static IP source binding entry.

```
Switch(config)# ip source binding 00:11:22:33:44:55 vlan 1 192.168.1.55 interface 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
```

show ip source interface

Syntax

show ip source interfaces IF_PORTS

Parameter

IF_PORTS	specifies ports to show

Default

No default is defined

Mode

Privileged EXEC

Usage

Use the **show ip source interface** command to show settings of IP Source Guard of interface

Example

The example shows how to show settings of IP Source Guard of interface gi1

```
switch# show ip source interfaces gi1
Port   |  Status       | Max Entry | Current Entry
----------+------------------------+--------------+--------------
gi1 | Verify MAC+IP | No Limit |  0
```

show ip source binding

Syntax

show ip source binding [(dynamic|static)]

Parameter

dynamic	Show entries that added by DHCP snooping learn

static	Show entries that added by user

Default

No default is defined

Mode

Privileged EXEC

Usage

Use the **show ip source binding** command to show binding entries of IP Source Guard.

Example

The example shows how to show static binding entries of IP Source Guard.

```
switch# show ip source binding
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
```

13. Link Aggregation

lag

Syntax

lag *<1-8>* **mode** (**static** | **active** | **passive**)
no lag

Parameter

<1-8>	Specify the LAG id for the interface

static	Specify the LAG to be static mode and join the interface into this LAG.
active	Specify the LAG to be dynamic mode and join the interface into this LAG with LACP active port.
passive	Specify the LAG to be dynamic mode and join the interface into this LAG with LACP passive port.

Default

There is no LAG in default.

Mode

Interface Configuration

Usage

Link aggregation group function allows you to aggregate multiple physical ports into one logic port to increase bandwidth. This command makes normal port join into the specific LAG logic port with static or dynamic mode. And use “**no lag**” to leave the LAG logic port.

Example

This example shows how to create a dynamic LAG and join fa1-fa3 to this LAG.

```
Switch(config)# interface range fa1-3
Switch(config-if)# lag 1 mode active
```

This example shows how to show current LAG status.

```
Switch# show lag
Load Balancing: src-dst-mac-ip.

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

lag load-balance

Syntax

lag load-balance (**src-dst-mac** | **src-dst-mac-ip)**
no lag load-balance

Parameter

src-dst-mac	Specify algorithm to balance traffic by using source and destination MAC address for all packets.
src-dst-mac-ip	Specify algorithm to balance traffic by using source and destination IP address for IP packets and using source and destination MAC address for non-IP packets.

Default

Default load balance algorithm is src-dst-mac

Mode

Global Configuration

Usage

Link aggregation group port should transmit packets spread to all ports to balance traffic loading. There are two algorithm supported and this command allow you to select the algorithm.

Example

This example shows how to change load balance algorithm to src-dst-mac-ip.

```
Switch(config)# lag load-balance src-dst-mac-ip
```

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.

Example

This example shows how to configure interface fa1 lacp port priority to 100.

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

lacp system-priority

Syntax

lacp system-priority *<1-65535>*
no lacp system-priority

Parameter

<1-65535>	Specify system priority value

Default

Default system priority is 32768.

Mode

Global Configuration

Usage

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.

Example

This example shows how to configure lacp system priority to 1000.

```
Switch(config)# lacp system-priority 1000
```

show lacp

Syntax

show lacp sys-id
show lacp [<1-8>] counters
show lacp [<1-8>] (internal | neighbor) [detail]

Parameter

Default

No default values for this command.

Mode

Privileged EXEC

Usage

Use "**show lacp sys-id**" command to displays the system identifier that is being used by LACP. The system identifier is made up of the LAPC system priority and the switch MAC address.
Use "**show lacp counter**" command to display LACP statistic information.

Use "**show lacp internal**" command to display local information.
Use "**show lacp neighbor**" command to display remote information.

Example

This example shows how to show system identifier that is being used by LACP

```
Switch# show lacp sys-id
  32768, 1c2a.a3c4.0292
```

This example shows how to show LACP statistics.

```
Switch# show lacp counters
               LACPDUs           LACPDUs
  Port           Sent     Recv        Pkts Err
```

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             | ------ |
```

14. LLDP

lldp

Syntax

lldp
no lldp

Parameter

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.

Example

The following example sets LLDP enable/disable.

```
Switch (config)# lldp
Switch# show lldp

State: Enabled Timer: 30 Seconds
```

```
Hold multiplier: 4 Reinit delay: 2 Seconds Tx delay: 2 Seconds
LLDP packet handling: Flooding

Port      |State | Optional TLVs     | Address
-------- + ------ + -------------- + --------
fa1   | RX,TX |                         |192.168.1.2
fa2 |     RX,TX |                       |192.168.1.2
fa3 |     RX,TX |                       |192.168.1.2
fa4 |     RX,TX |                       |192.168.1.2
fa5   |RX,TX    |                        |192.168.1.2
```

lldp rx

Syntax

lldp rx
no lldp rx

Parameter

Default

Default is enabled

Mode

Port Configuration

Usage

Use “**lldp rx**” command to enable the LLDP PDU RX ability. The configuration could be shown by “**show lldp**” command.

Example

This example sets port gi1 to enable LLDP RX

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

lldp tx

Syntax

lldp tx
no lldp tx

Parameter

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.

Example

This example sets port gi1 to enable LLDP TX

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

lldp lldpdu

Syntax

lldp lldpdu (filtering|flooding|bridging)

Parameter

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

Default

Default LLDP PDU handling behavior when LLDP disabled is flooding

Mode

Global Configuration

Usage

Use "**lldp lldpdu**" command to configure the LLDP PDU handling behavior when LLDP is globally disabled. It should be noticed that if LLDP is globally enabled and per port LLDP RX status is configured to disabled, the received LLDP PDU would be dropped instead of taking the global disable behavior.

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 tlv-select

Syntax

lldp tlv-select *TLV* [*TLV*] [*TLV*] [*TLV*] [*TLV*] [*TLV*] [*TLV*] [*TLV*]
no lldp tlv-select

Parameter

TLV	Specify the selected optional TLV. Available optional TLVs are : sys-name (system name), sys-desc (system description), sys-cap (system capability), mac-phy (802.3 MAC-PHY), lag (802.3

	link aggregation), max- frame-size (802.3 max frame size), and management-addr (management address).

Default

Default is no selected optional TLV.

Mode

Port Configuration

Usage

Use "lldp tlv-select" command to attach selected TLV in PDU.

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

Syntax

lldp tlv-select pvid (disable|enable)
no lldp tlv-select pvid

Parameter

disable	Disable LLDP 802.1 PVID TLV attach state
enable	Enable LLDP 802.1 PVID TLV attach state

Default

Default is enabled

Mode

Port Configuration

Usage

Use “**lldp tlv-select pvid**” command to configure the 802.1 PVID TLV attach enable status. The configuration could be shown by “**show lldp**” command.

Example

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

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

Switch# show lldp interfaces gi1,gi2

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

Port      |    State | Optional TLVs           | Address
```

```
-------- + ------ + -------------- + --------    gi1 |         RX,TX |  |192.168.1.254
gi2 |            RX,TX |                              |192.168.1.254

Port ID: gi1
802.3 optional TLVs:
802.1 optional TLVs PVID: Disabled

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

lldp tlv-select vlan-name

Syntax

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

Parameter

add *VLAN-LIST*	Add VLAN list for LLDP 802.1 VLAN-NAME TLV on the specific interface. The configured ports should be member of all the specified VLANs or the VLAN-LIST is not valid.
remove *VLAN-LIST*	Remove VLAN list of LLDP 802.1 VLAN-NAME TLV from interface.

Default

Default is no VLAN added.

Mode

Port Configuration

Usage

Use “**lldp tlv-select vlan-name**” command to add or remove VLAN 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
-------- + ------ + -------------- + --------
gi1          | RX,TX     |                            |192.168.1.2

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

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
-------- + ------ + -------------- + --------
gi1 |   RX,TX | PD, SN, SD, SC |192.168.1.254
Gi2 |   RX,TX |                      |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: 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

IF_NMLPORTS	Specify the ports to display information

Default

There is no default configuration for this command

Mode

Privileged EXEC

Usage

Use “**show lldp local-device**” command to show the local configuration of LLDP PDU. By the commands, a user can view the contents of LLDP/ LLDP-MED TLVs that would be attached in LLDP PDU.

Example

This example displays the local device information.

```
Switch# show lldp local-device

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)
```

show lldp neighbor

Syntax

show lldp neighbor
show lldp interfaces *IF_NMLPORTS* **neighbor**

Parameter

IF_NMLPORTS	Specify the ports to display information

Default

There is no default configuration for this command

Mode

Privileged EXEC

Usage

Use “**show lldp neighbor**” command to display the received neighbor LLDP PDU information.

Example

This example displays the neighbor information.

```
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
```

15.Logging

logging

Syntax

logging
no logging

Parameter

Default

Logging service is enabled.

Mode

Global Configuration

Usage

To enable logging service on the switch, use the command **logging** in the Global Configuration mode.

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

ipv4-addr	IPv4 address of the remote logging server.
hostname	Hostname of the remote logging server.
facility *facility*	Specify the facility of the logging messages. It can be on of the following value: local0, local1, local2, local3, local4, local5, local6, and local7. The default value of facility is local7.
port *port*	Specify the port number of the remote logging server. The valid range is from 0 to 65535, and the default value is 512.
severity *sev*	Specify the minimum severity of the logging messages. The valid range is from 0 to 7, and the number 0 to 7 represents emerg, alert, critical, error, warning, notice, info, and debug individually. The default value of minimum severity level is 5 (emerg, alert, crit, error,warning, notice).

Default

No remote logging destination is configured.

Mode

Global Configuration

Usage

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

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

Example

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

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

logging severity

Syntax

logging (**buffered**|**console**|**file**) [**severity** *sev*]

no logging (**buffered**|**console**|**file**)

Parameter

buffered	Log messages to RAM.
console	Log messages to console buffer.
file	Log messages to Flash.

severity *sev*	Specify the minimum severity of the logging messages. The valid range is from 0 to 7, and the number 0 to 7 represents emerg, alert, critical, error, warning, notice, info, and debug individually. The default minimum severity of the **logging severity** configuration is 5 (emerg,alert, crit, error, warning, notice).

Default

Logging to buffered and console is enabled, and the default minimum severity level is 5 (emerg, alert, crit, error, warning, notice).

Mode

Global Configuration

Usage

To set the minimum severity for the messages that are logged to RAM, console, or Flash, use the command logging severity in the Global Configuration mode. Use the **no** form of the command to remove the mechanism of logging to RAM, console, or Flash individually.

Example

The following example sets the minimum severity level of logging to RAM and Flash as debugging.

```
Switch(config)# logging buffered 7
Switch(config)# logging flash 7
```

show logging

Syntax

show logging [**buffered**|**file**]

Parameter

buffered	Display the log messages stored in the RAM.
file	Display the log messages stored in the Flash.

Default

Mode

Previledged EXEC

Usage

To display the global logging configuration, and the logging messages stored in the RAM and Flash, use the command **show logging** in the Privileged EXEC mode.

Example

The following example shows the global logging configuration.

```
Switch# show logging

Logging service is enabled

Aggregation: enabled
Aggregation aging time: 300 sec

Console Logging: level notice
Buffer Logging : level notice
File Logging      : disabled

Buffer Logging
--------------
*Mar 20 2020 18:27:26: AAA-5-CONNECT: New console connection for user admin, source async ACCEPTED
*Mar 20 2020 18:27:24: AAA-4-REJECT: New console connection, source async REJECTED
*Mar 20 2020 18:16:08: AAA-5-DISCONNECT: console connection for user admin, source async TERMINATED
*Mar 20 2020 18:12:21: PORT-5-LINK_DOWN: Interface GigabitEthernet19 link down
*Mar 20 2020 17:58:23: PORT-5-LINK_UP: Interface GigabitEthernet19 link up, aggregated (2)
*Mar 20 2020 17:58:22: PORT-5-LINK_DOWN: Interface GigabitEthernet19 link down, aggregated (2)
```

clear logging

Syntax

clear logging (**buffered**|**file**)

Parameter

buffered	Clear the log messages stored in the RAM.
file	Clear the log messages stored in the Flash.

Default

Mode

Privileged EXEC

Usage

To clear the log messages from the internal logging buffer and flash, use the command **clear logging** in the Privileged EXEC mode.

Example

The following example clear the log messages stored in RAM and Flash.

```
Switch# clear logging buffered
Switch# clear logging file
```

16.MAC Address Table

mac address-table aging-time

Syntax

mac access-table aging-time *seconds*

Parameter

seconds	The time in seconds that an entry remains in the MAC address table. Its valid range is from 10 to 630 seconds,and the default value is 300 seconds.

Default

The default aging time is 300 seconds.

Mode

Global Configuration

Usage

To set the aging time of the MAC address table, use the command **mac address-table aging-time** in the Global Configuration mode.

Example

The following example set the agimg time to 500 seconds.

```
Switch(config)# mac address-table aging-time 500
```

mac address-table static

Syntax

mac address-table static *mac-addr* **vlan** *vlan-id* **interfaces** *IF_PORTS*
mac address-table static *mac-addr* **vlan** *vlan-id* **drop**
no mac address-table static *mac-addr* **vlan** *vlan-id*

Parameter

mac-addr	MAC address.
vlan *vlan-id*	Specify the VLAN ID for the interface.
Interface *IF_PORTS*	Specify the interface ID or a list of interface IDs.
drop	Drop the packets with the specified source or destination unicast MAC address.

Default

No static addresses are configured

Mode

Global Configuration

Usage

To add a static address to the MAC address table, use the command **mac address-table static** in the Global Configuration mode. For the unicast MAC address filtering, use the command **mac address-table static** with parameter **drop** to drop the packets with the specified source or destination unist MAC address. To delete the static entry from the MAC address table, use the **no** form of the command.

Example

The following example adds a static address into MAC address table.

```
Switch# mac address-table static 00:11:22:33:44:55 vlan 1 interfaces fa5
```

The following example adds a rule of unist address filtering into MAC address table.

```
Switch# mac address-table static 00:11:22:33:44:55 vlan 1 drop
```

clear mac address-table

Syntax

clear mac address-table dynamic [interfaces *IF_PORTS***|vlan** *vlan-id***]**

Parameter

interfaces ***IF_PORTS***	Delete all dynamic addresses learned on the specific interface.
vlan *vlan-id*	Delete all source addresses learned on the specific VLAN.

Default

Mode

Privileged EXEC

Usage

To clear the dynamic (learned) MAC entries from the MAC address table, the specific interface, or the specific VLAN, use the command **clear mac address-table** in the Priveleged EXEC mode.

Example

The following example clears the learned MAC addresses on the interface gi1.

```
Switch# clear mac address-table dynamic interfaces gi1
```

show mac address-table

Syntax

show mac address-table [**dynamic**|**static**] [**interface** *IF_PORTS*] [**vlan** *vlan-id*]
show mac address-table [*mac-addr*] [**vlan** *vlan-id*]

Parameter

dynamic	Display only dynamic MAC addresses
static	Display only static MAC addresses
interface *IF_PORTS*	Display the MAC addresses entries for a specifc interface.
vlan *vlan-id*	Display the MAC address entries for a specific VLAN.
mac-addr	Display entries for a specific MAC address

Default

Mode

Privileged EXEC

Usage

To show the entry in the MAC address table, use the command **show mac address-table** in the Privilieged EXEC mode.

Example

The following example displays the entire MAC addrss table.

```
Switch# show mac address-table
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
```

show mac address-table counters

Syntax

show mac address-table counters

Parameter

Default

Mode

Privileged EXEC

Usage

To display the total entries in the MAC addrss table, use the command **show mac address-table counters** in the Privilieged EXEC mode.

Example

The following example display numbers of addresses in the address table.

```
Switch# show mac address-table counters
Total number of entries: 5
```

show mac address-table aging-time

Syntax

show mac address-table aging-time

Parameter

Default

Mode

Privileged EXEC

Usage

To show MAC address aging time, use the command **show mac address-table aging-time** in the Privilieged EXEC mode.

Example

The following example displays aging time for the MAC address table.

```
Switch# show mac address-table aging-time
  Mac Address Table aging time:          300 sec
```

17.MAC VLAN

vlan mac-vlan group (Global)

Syntax

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

Parameter

<1-2147483647>	Specify the group ID

Mac-address	Specify the MAC address to be mapped.
<9-48>	Specify the mask length of MAC address.

Default

No MAC Groups are configured.

Mode

Global Configuration

Usage

Use the "**vlan mac-vlan group**" command to create MAC address group.
Use the **no** form of this command to delete specify group.

Example

The following example shows how to create a MAC group with group ID 3.

```
Switch(config)# vlan mac-vlan group 333 22:33:44:55:66:77 mask 48
```

vlan mac-vlan group (Interface)

Syntax

vlan mac-vlan group <1- 2147483647**> vlan <**1-4094**>**
no vlan mac-vlan [group <1- 2147483647**>]**

Parameter

<1-2147483647>	Specify the group ID.(optional in no form) Delete all mapping group if not specify.
<1-4094>	Specify the VLAN ID to give to match packet.

Default

No mappings are configured.

Mode

Interface Configuration

Usage

Use the “**vlan mac-vlan group”** to create mapping of group and VLAN ID of an interface. Use the **no** form of this command to delete mapping.

Example

The following example shows how to mapping group id 333 to VLAN 100 on interface fa1.

```
Switch(config)# interface fa1
Switch(config-if)# vlan mac-vlan group 333 VLAN 100
```

show vlan mac-vlan groups

Syntax

show vlan mac-vlan groups

Parameter

Default

Mode

Privileged EXEC

Usage

Use the **show vlan mac-vlan groups** command to display mac groups configuration

Example

This following example shows how to display mac group.

```
Switch# show vlan mac-vlan groups
Mac Address          Mask                  Group Id
```

```
-------------------- --------------------     ------------------
 --
22:33:44:55:66:77       48         222
44:55:66:77:88:99       48         333
88:99:00:aa:bb:cc         40         444
88:99:00:ab:bb:10       48          111
```

show vlan mac-vlan interfaces

Syntax

show vlan mac-vlan [interfaces IF_PORTS]

Parameter

IF_PORTS	(Optional) Specify interfaces mac vlan to display. Display all ports if not specify.

Default

Mode

Privileged EXEC

Usage

Use the **show vlan mac-vlan interface** command in EXEC mode to display the mac-vlan interfaces setting

Example

The following example shows how to display the MAC-Based VLAN interfaces setting

```
Switch# show vlan mac-vlan interfaces fa1
Port fa1 :
Mac based VLANs: Group ID Vlan ID
------------             -------
333          444
444            1
```

18.Management ACL

management access-list

Syntax

management access-list NAME
no management access-list NAME

Parameter

NAME	The name of management ACL

Default

No management ACL is configured.

Mode

Global Configuration

Usage

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

Example

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

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

management access-class

Syntax

management access-class NAME
no management access-class

Parameter

NAME	The name of management ACL to be used.

Default

Default is no management ACL restrictions

Mode

Global Configuration

Usage

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

Example

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

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

deny

Syntax

[sequence <1-65535>**] deny interfaces** IF_PORTS **service(all|http|https|snmp|ssh|telnet)**
[sequence <1-65535>**] deny ip** A.B.C.D/A.B.C.D **interfaces** IF_PORTS service (all|http|https|snmp|ssh|telnet)
[sequence <1-65535>**] deny ipv6** X:X::X:X/<0-128> **interfaces** IF_PORTS service (all|http|https|snmp|ssh|telnet)

Parameter

<1-65535>	(Optional) Specify sequence index of ACL entry, the sequence index represent the priority of an entry in

	ACL. If not specified, the switch assigns a number from 1 in ascending order.
interfaces *IF_PORTS*	Specify the interface ID or a list of interface IDs.
ip A.B.C.D/A.B.C.D	Specify the source IP address and mask of packet.
ipv6 X:X::X:X/<0-128>	Specify the source IPv6 address and prefix length of packet.
(all|http|https|snmp|ssh|telnet)	Specify the type of services.

Default

No rules are configured.

Mode

Management Access-List Configuration

Usage

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

Example

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

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

permit

Syntax

```
[sequence <1-65535>] permit interfaces IF_PORTS service (all|http|https|snmp|ssh|telnet)
[sequence <1-65535>] permit ip A.B.C.D/A.B.C.D interfaces IF_PORTS service
(all|http|https|snmp|ssh|telnet)
[sequence <1-65535>] permit ipv6 X:X::X:X/<0-128> interfaces IF_PORTS service
(all|http|https|snmp|ssh|telnet)
```

Parameter

<1-65535>	(Optional) Specify sequence index of ACL entry, the sequence index represent the priority of an entry in ACL. If not specified, the switch assigns a number from 1 in ascending order.
interfaces *IF_PORTS*	Specify the interface ID or a list of interface IDs.
ip A.B.C.D/A.B.C.D	Specify the source IP address and mask of packet.
ipv6 X:X::X:X/<0-128>	Specify the source IPv6 address and prefix length of packet.
(all|http|https|snmp|ssh|telnet)	Specify the type of services.

Default

No rules are configured.

Mode

Management Access-List Configuration

Usage

Use the permit command to add permit rules that bypass those packets hit the rule.

Example

The following example shows how to add a permit rule to bypass http service packets that source ip is 2.2.2.2 from interface gi1.

```
Switch(config)# management access-list test
Switch(config-macl)# sequence 2 permit ip
2.2.2.2/255.255.255.255 interfaces gi1 service http
```

no sequence

Syntax

no sequence <1-65535>

Parameter

<1-65535>	Specify sequence index of ACL entry to delete.

Default

No rules are configured.

Mode

Management Access-List Configuration

Usage

Use the **no sequence** command to delete an entry in management ACL.

Example

The following example shows how to delete an entry.

```
Switch(config)# management access-list test
Switch(config-macl)# sequence 10 deny interfaces gi1 service all
Switch(config-macl)# no sequence 10
```

show management access-list

Syntax

show management access-list [NAME**]**

Parameter

NAME	Specify the name of management ACL to displayed

Default

No default is defined

Mode

Privileged EXEC

Usage

Use the **show management access-list** command to show management ACL.

Example

The example shows how to show management access-list

```
Switch#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)
```

show management access-class

Syntax

show management access-class

Parameter

Default

No default is defined

Mode

Privileged EXEC

Usage

Use the **show management access-class** command to show the active management access-list.

Example

The example shows how to show management access-class

```
Switch# show management access-class
Management access-class is enabled, using access-list test
```

19.MLD Snooping

ipv6 mld snooping

Syntax

ipv6 mld
snooping no ipv6
mld snooping

Parameter

Default

Default is disabled

Mode

Global Configuration

Usage

Use the **ipv6 mld snooping** command to enable MLD snooping function. Use the **no** form of this command to disable. Disable will clear all ipv6 mld snooping dynamic group and dynamic router port, and make the static ipv6 mld group invalid. No more dynamic group and router port by mld message will be learned.
You can verify settings by the **show ipv6 mld snooping** command.

Example

The following example specifies that set **ipv6 mld snooping** test.

```
Switch(config)# ipv6 mld snooping
```

ipv6 mld snooping report-suppression

Syntax

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

Parameter

Default

Default is enabled

Mode

Global Configuration

Usage

Use the **ipv6 mld snooping report-suppression** command to enable MLD snooping report-suppression function.
Use the **no** form of this command to disable. Disable report-supression will forward all received reports to the vlan router ports.
You can verify settings by the **show ipv6 mld snooping** command.

Example

The following example specifies that disable ipv6 mld snooping report- suppression test.
Switch(config)# **no ipv6 mld snooping report-suppression**

ipv6 mld snooping version

Syntax

ipv6 mld snooping version (1|2)

Parameter

(1|2)	Ipv6 mld snooping running version 1 or 2

Default

Default is version 1

Mode

Global Configuration

Usage

Use the **ipv6 mld snooping version** command to change MLD support version. Version 2 packet won't be processed if choose version 1.
You can verify settings by the **show ip igmp snooping** command.

Example

The following example specifies that set ipv6 mld snooping version 2.

Switch(config)# **ipv6 mld snooping version 2**

ipv6 mld snooping unknown-multicast action

Syntax

ipv6 mld snooping unknown-multicast action (drop | flood |router-port)
no ipv6 mld snooping unknown-multicast action

Parameter

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

Default

Default is flood.

Mode

Global Configuration

Usage

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

Use the **ipv6 mld snooping unknown-multicast action** command to change action.
Use the **no** form of this command to restore to default.
You can verify settings by the **show ipv6 mld snooping** command.

Example

The following example specifies that set ipv6 mld unknown multicast action router-port test.

```
Switch(config)# ipv6 mld snooping unknown-multicast action router-port
```

ipv6 mld snooping vlan

Syntax

ipv6 mld snooping vlan VLAN-LIST
no ipv6 mld snooping vlan VLAN-LIST

Parameter

VLAN-LIST	specifies VLAN ID list to set

Default

Default is disabled for all VLANs

Mode

Global Configuration

Usage

Disable will clear all ipv6 mld snooping dynamic group and dynamic router port and make all static ip igmp group invalid of this vlan. Will not learn dynamic group and router port by igmp

message any more.
Use the **ipv6 mld snooping vlan** command to enable MLD on VLAN.
Use the **no** form of this command to disable
You can verify settings by the **show ipv6 mld snooping vlan** command.

Example

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

Switch(config)# **ipv6 mld snooping vlan 1**

ipv6 mld snooping vlan fastleave

Syntax

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

Parameter

VLAN-LIST	specifies VLAN ID list to set

Default

Default is disabled

Mode

Global Configuration

Usage

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

Example

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

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

ipv6 mld snooping vlan last-member-query-count

Syntax

ipv6 mld snooping vlan <VLAN-LIST> last-member-query-count <1-7>
no ipv6 mld snooping vlan <VLAN-LIST> last-member-query-count

Parameter

VLAN-LIST	specifies VLAN ID list to set
last-member-query-count <1-7>	specifies last member query count to set

Default

Default is 2

Mode

Global Configuration

Usage

Use the **ipv6 mld snooping vlan last-member-query-count** command to change how many query packets will send.
Use the **no** form of this command to restore to default.
You can verify settings by the **show ipv6 mld snooping vlan** command

Example

The following example specifies that set **ipv6 mld snooping vlan last- member-query-count** test.

```
Switch(config)# ipv6 mld snooping vlan 1 last-member-query-count 5
```

ipv6 mld snooping vlan last-member-query-interval

Syntax

```
ipv6 mld snooping vlan <VLAN-LIST> last-member-query-interval <1- 60>
no ipv6 mld snooping vlan <VLAN-LIST> last-member-query-interval
```

Parameter

VLAN-LIST	specifies VLAN ID list to set
last-member-query-interval <1-60>	specifies last member query interval to set

Default

Default is 1

Mode

Global Configuration

Usage

Use the **ipv6 mld snooping vlan last-member-query-interval** command to set interval between each query packet.
Use the **no** form of this command to restore to default

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

Example

The following example specifies that set **ipv6 mld snooping vlan last- member-query-interval** test.

```
Switch(config)# ipv6 mld snooping vlan 1 last-member-query-interval 3
```

ipv6 mld snooping vlan query-interval

Syntax

```
ipv6 mld snooping vlan <VLAN-LIST> query-interval <30-18000>
```

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

Parameter

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

Default

Default is 125

Mode

Global Configuration

Usage

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

Example

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

ipv6 mld snooping vlan response-time

Syntax

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

Parameter

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

Default

Default is 10

Mode

Global Configuration

Usage

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

Example

The following example specifies that set **ipv6 mld snooping vlan response- time** test.

```
Switch(config)# ipv6 mld snooping vlan 1 response-time 12
```

ipv6 mld snooping vlan router

Syntax

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

Parameter

VLAN-LIST	specifies VLAN ID list to set

Default

Default is enabled

Mode

Global Configuration

Usage

Use the **ipv6 mld snooping vlan router** command to enable learning router port by routing protocol packets such as PIM/PIMv2, DVMRP, MOSPF. Use the **no** form of this command to disable.

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

Example

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

Switch(config)# **ipv6 mld snooping vlan 99 router**

ipv6 mld snooping vlan static-port

Syntax

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

Parameter

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

Default

No static port by default

Mode

Global Configuration

Usage

Use the **ipv6 mld snooping vlan static-port** command to add static forwarding port, all known vlan 1 ipv6 group will add the static ports.

Use the **no** form of this command to delete static port.

You can verify settings by the **show ipv6 mld snooping forward-all** command.

Example

The following example specifies that set ipv6 mld snooping static port test.

Switch(config)# **ipv6 mld snooping vlan 1 static -port gi1-2**

ipv6 mld snooping vlan forbidden-router-port

Syntax

ipv6 mld snooping vlan <VLAN-LIST> forbidden-router-port IF_PORTS
no ipv6 mld snooping vlan <VLAN-LIST> forbidden-router-port IF_PORTS

Parameter

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

Default

No forbidden router ports by default

Mode

Global Configuration

Usage

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

Example

The following example specifies that set ipv6 mld snooping forbidden test.

```
Switch(config)# ipv6 mld snooping vlan 1 forbidden-router-port gi2
```

ipv6 mld snooping vlan static router port

Syntax

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

Parameter

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

Default

None static router ports by default

Mode

Global Configuration

Usage

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

Example

The following example specifies that set ipv6 mld snooping static test.

```
Switch(config)# ipv6 mld snooping vlan 1 static-router-port gi1-2
```

ipv6 mld snooping vlan static-group

Syntax

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

Parameter

VLAN-LIST	specifies VLAN ID list to set
ipv6-addr	specifies multicast group ipv4 address
IF_PORTS	specifies port list to set or remove

Default

No static group by default

Mode

Global Configuration

Usage

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

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

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

Example

The following example specifies that set ipv6 mld snooping static group test.

```
Switch(config)# ipv6 mld snooping vlan 1 static-group ff13::1 interfaces gi1-2
```

ipv6 mld snooping vlan group

Syntax

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

Parameter

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

Default

Mode

Global Configuration

Usage

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

Example

The following example specifies that set ip igmp snooping static group test.

```
Switch(config)# no ip igmp snooping vlan 1 group ff13::1
```

ipv6 mld profile

Syntax

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

Parameter

<1-128>	specifies profile ID

Default

No profie exist by default

Mode

Global Configuration

Usage

Use the **ipv6 mld profile** command to enter profile configuration Use the **no** form of this command to delete profile
You can verify settings by the **show ipv6 mld profile** command

Example

The following example specifies that set ipv6 mld profile test.

```
Switch(config)# ipv6 mld profile 1
Switch(config-mld-profile)# profile range ipv6 ff13::1 ff13::10 action permit
```

profile range

Syntax

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

Parameter

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

Default

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 filter

Syntax

```
ipv6 mld filter <1-128>
no ipv6 mld filter
```

Parameter

<1-128>	specifies profile ID
[interfaces IF_PORTS]	specifies interfaces to display

Default

Mode

Port Configuration

Usage

Use the **ipv6 mld filter** command to bind a profile for port. When the port bind a profile. Then the port learning group will update, if the group is not match the profile rule it will remove the port from the group. Static group is excluded.
Use the **no** form of this command to delete profile
You can verify settings by the **show ipv6 mld filter** command

Example

The following example specifies that set ipv6 mld filter test.

```
Switch(config)# interface gi1
Switch(config-if)# ipv6 mld filter 1
```

ipv6 mld max-groups

Syntax

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

Parameter

<0-1024>	specifies profile ID

Default

Default is 1024

Mode

Port Configuration

Usage

Use the **ipv6 mld max-groups** command to limit port learning max group number. When the port has reach limitation, new group will not add this port. Static group is excluded.

Use the **no** form of this command to restore to default
You can verify settings by the **show ipv6 mld max-groups** command.

Example

The following example specifies that set ipv6 mld max-groups test.

```
Switch(config)# interface gi1
Switch(config-if)# ipv6 mld max-groups 10
```

ipv6 mld max-groups action

Syntax

ipv6 mld max-groups action (deny | replace)

Parameter

(deny | replace)	Deny: current port igmp group arrived max-groups,don't add group. Replace: current port igmp group arrived max-groups,remove port for rand group, and add port to new group.

Default

Default action is deny

Mode

Interface mode

Usage

Use the **ipv6 mld max-groups action** command to set the action when the numbers of groups reach the limitation.
Use the **no** form of this command to restore to default
You can verify settings by the **show ipv6 mld max-groups** command.

Example

The following example specifies that set action replace test.

```
Switch(config-if)#ipv6 mld max-groups action replace
```

clear ipv6 mld snooping groups

Syntax

clear ipv6 mld snooping groups [(dynamic | static)]

Parameter

None	Clear ipv6 mld groups include dynamic and static
(dynamic | static)	ipv6 mld group type is dynamic or static

Default

Mode

Privileged EXEC

Usage

This command will clear the ipv6 mld groups for dynamic or static or all of type.
You can verify settings by the **show ipv6 mld snooping groups** command..

Example

The following example specifies that clear ipv6 mld snooping groups test.

Switch# **clear ipv6 mld snooping groups**

clear ipv6 mld snooping statistics

Syntax

clear ipv6 mld snooping statistics

Parameter

Default

Mode

Privileged EXEC

Usage

This command will clear the igmp statistics.
You can verify settings by the **show ipv6 mld snooping** command.

Example

The following example specifies that clear ipv6 mld snooping statistics test.

```
Switch# clear ipv6 mld snooping statistics
```

show ipv6 mld snooping groups counters

Syntax

show ipv6 mld snooping groups counters

Parameter

Default

Mode

Privileged EXEC

Usage

This command will display the ipv6 mld group counter include static group.

Example

The following example specifies that display ipv6 mld snooping group counter test.

```
Switch# show ipv6 mld snooping group counters
Total ipv6 mld snooping group number: 2
```

show ipv6 mld snooping groups

Syntax

show ipv6 mld snooping groups [(dynamic | static)]

Parameter

none	Show ipv6 mld groups include dynamic and static

(dynamic | static)	Display ipv6 mld group type is dynamic or static

Default

display all ipv6 mld groups

Mode

Privileged EXEC

Usage

This command will display the ipv6 mld groups for dynamic or static or all of type.

Example

The following example specifies that show ipv6 mld snooping groups test.

```
Switch# show ipv6 mld snooping groups
VLAN |        Group IP Address       | Type | Life(Sec) | Port
------+---------------------------------------+--------+-----------+-----------------
1 |                ff13::1 |  Static|     --     | fa1
1 |                ff13::2 |  Static|     --      | fa2
Total Number of Entry = 2
```

show ipv6 mld snooping router

Syntax

show ipv6 mld snooping router [(dynamic | forbidden |static)]

Parameter

none	Show ipv6 mld router include dynamic and static and forbidden
(dynamic | forbidden | static)	Display ipv6 mld router info for different type

Default

Mode

Privileged EXEC

Usage

This command will display the ipv6 mld router info.

Example

The following example specifies that show ipv6 mld snooping router test.

```
Switch# show ipv6 mld snooping router
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
```

show ipv6 mld snooping

Syntax

show ipv6 mld snooping

Parameter

Default

Mode

Privileged EXEC

Usage

This command will display ipv6 mld snooping global info.

Example

The following example specifies that show ipv6 mld snooping test.

```
Switch# show ipv6 mld snooping
MLD Snooping Status
--------------------

Snooping              : Disabled
Report Suppression          : Enabled
Operation Version   : v1
Forward Method      : mac
Unknown Multicast Action                        : Flood

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

show ipv6 mld snooping vlan

Syntax

show ipv6 mld snooping vlan [VLAN-LIST]

Parameter

none	Show all ipv6 mld snooping vlan info
[VLAN-LIST]	Show specifies vlan ipv6 mld snooping info

Default

Show all ipv6 mld snooping vlan info

Mode

Privileged EXEC

Usage

This command will display ipv6 mld snooping vlan info.

Example

The following example specifies that show ipv6 mld snooping vlan test.

```
Switch# show ipv6 mld snooping vlan 1
MLD Snooping is globaly disabled
MLD Snooping VLAN 1 admin : disabled
MLD Snooping oper mode : disabled
MLD Snooping robustness: admin 2 oper 2
MLD Snooping query interval: admin 125 sec oper 125 sec
MLD Snooping query max response : admin 10 sec oper 10 sec
MLD Snooping last member query counter: admin 2 oper 2
MLD Snooping last member query interval: admin 1 sec oper 1 sec
MLD Snooping last immediate leave: disabled
MLD Snooping automatic learning of multicast router ports: enabled
```

show ipv6 mld snooping forward-all

Syntax

show ipv6 mld snooping forward-all [vlan VLAN-LIST]

Parameter

none	Show all ipv6 mld snooping vlan forward-all info
[vlan VLAN-LIST]	Show specifies vlan of ipv6 mld forward info.

Default

Show all vlan ipv6 mld forward all info

Mode

Privileged EXEC

Usage

This command will display ipv6 mld snooping forward all info.

Example

The following example specifies that show ipv6 mld snooping forward-all test.

```
Switch# show ipv6 mld snooping forward-all
MLD Snooping VLAN1
MLD Snooping static port: None
MLD Snooping forbidden port : None
```

show ipv6 mld profile

Syntax

show ipv6 mld profile [<1-128>]

Parameter

none	Show all ipv6 mld snooping profile info
[<1-128>]	Show specifies index profile info

Default

Show all ipv6 mld profile info

Mode

Privileged EXEC

Usage

This command will display ipv6 mld profile info.

Example

The following example specifies that show ipv6 mld profile test.

```
Switch# show ipv6 mld profile
IPv6 mld profile index: 1
IPv6 mld profile action: permit
Range low ip: ff13::1
Range high ip: ff13::10
```

show ipv6 mld filter

Syntax

show ipv6 mld filter [interfaces IF_PORTS]

Parameter

none	Show all port filter
[interfaces IF_PORTS]	Show specifies ports filter

Default

Mode

Privileged EXEC

Usage

This command will display ipv6 mld port filter info.

Example

The following example specifies that show ipv6 mld filter test.

```
Switch# show ipv6 mld filter
Port ID   |   Profile ID
---------+--------------
gi1 : 1
gi2 : None
gi3 : None
gi4 : None
gi5 : None
 --More--
```

show ipv6 mld max-group

Syntax

show ipv6 mld max-group [interfaces IF_PORTS]

Parameter

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

Default

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 max-group action

Syntax

show ipv6 mld max-group action [interfaces IF_PORTS]

Parameter

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

Default

Show all ports ipv6 mld max-group action

Mode

Privileged EXEC

Usage

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

Example

The following example specifies that show ipv6 mld max-group action test.

```
Switch(config-if)# ipv6 mld max-groups action replace
Switch# show ipv6 mld max-group action
Port ID | Max-groups Action
---------+--------------------
gi1 : replace
gi2 : deny
gi3 : deny
gi4 : deny
gi5 : deny
--More--
```

20.MVR

mvr

Syntax

mvr
no mvr

Parameter

Default

Default is disabled

Mode

Global Configuration

Usage

Use the **mvr** command to enable MVR function. The command will clear all mvr VLAN ID multicast snooping group.

Use the **no** form of this command to disable. Disable will clear all mvr group. You can verify settings by the **show mvr** command.

Example

The following example specifies that set **mvr** test.

```
Switch(config)# mvr
Switch(config)# no mvr
Switch# show mvr
MVR Running : Disabled
MVR Multicast VLAN : 1
MVR Group Range :  None
MVR Max Multicast Groups : 128
MVR Current Multicast Groups : 0
MVR Global query response time : 1 sec
MVR Mode : compatible
```

mvr vlan

Syntax

mvr vlan <VLAN-ID>

Parameter

<VLAN-ID>	The exist static vlan id

Default

Default mvr vlan id is 1

Mode

Global Configuration

Usage

Use the **mvr vlan** command to modify mvr vlan id when the mvr status is enabled.
Change mvr vlan id will delete the old mvr vlan and new mvr vlan group. If there have configure

source or receiver port, there will check the source must only in the mvr vlan , and receiver port must not in the mvr vlan member.

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

Example

The following example specifies that configure mvr vlan 2 test.

```
Switch(config)# vlan 2
Switch(config)# mvr
The operation will delete groups of VLAN ID is MVR VLAN include static groups.
Continue? [yes/no]:y
Switch(config)# mvr vlan 2
The operation will delete the old and new MVR VLAN groups include
static MVR groups.Continue? [yes/no]:y

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

Syntax

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

Parameter

Default

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

Mode

Global Configuration

Usage

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

Example

The following example specifies that set mvr group range is 224.1.1.1 ~ 224.1.1.8 test.

```
Switch(config)# mvr
Switch(config)# mvr group 224.1.1.1 8
The operation will delete the MVR VLAN groups include static MVR groups.Continue?
[yes/no]:y
Switch# show mvr
MVR Running : Enabled
MVR Multicast VLAN : 2
MVR Group Range : 224.1.1.1 ~ 224.1.1.8
MVR Max Multicast Groups : 128
MVR Current Multicast Groups : 0
MVR Global query response time : 1 sec
MVR Mode : compatible
```

mvr mode

Syntax

mvr mode (dynamic | compatible)

Parameter

(dynamic|compatible)	dynamic: Allows dynamic MVR membership on source ports compatible: does not support IGMP dynamic joins on source ports.

Default

Default is compatible.

Mode

Global Configuration

Usage

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

Example

The following example specifies that set mvr mode dynamic test.

```
Switch(config)#mvr
Switch(config)#mvr mode dynamic
Switch# show mvr
MVR Running : Enabled
MVR Multicast VLAN : 2
MVR Group Range : 224.1.1.1 ~ 224.1.1.8
MVR Max Multicast Groups : 128
MVR Current Multicast Groups : 0
MVR Global query response time : 1 sec
MVR Mode : dynamic
```

mvr query-time

Syntax

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

Parameter

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

Default

Default is 1 sec

Mode

Global Configuration

Usage

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

Example

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

```
Switch(config)# mvr
Switch(config)# mvr query-time 10
Switch# show mvr
MVR Running : Enabled
MVR Multicast VLAN : 2
MVR Group Range : 224.1.1.1 ~ 224.1.1.8
MVR Max Multicast Groups : 128
MVR Current Multicast Groups : 0
MVR Global query response time : 10 sec
MVR Mode : dynamic
```

mvr port type

Syntax

mvr type (source | receiver)
no mvr type

Parameter

(source | receiver)	Source: Configure uplink ports that receive and send multicast data as source ports. Subscribers cannot be directly connected to source ports. All source ports on a switch belong to the single multicast VLAN. Receiver: Configure a port as a receiver port if it is a subscriber port and should only receive multicast data. It does not receive data unless it becomes a member of the multicast group, either statically or by using IGMP leave and join messages. Receiver ports cannot belong to themulticast VLAN.

Default

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 immediate

Syntax

mvr immediate
no mvr immediate

Parameter

Default

Default is disabled

Mode

Port Configuration

Usage

Use the **mvr immediate** command to configure mvr support immediate leave when mvr is enabled.
Note This command applies to only receiver ports and should only be enabled on receiver ports to which a single receiver device is connected.
Use the **no** form of this command to disable immediate leave. You can verify settings by the **show mvr interface** command

Example

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

```
Switch(config)# interface gi2
Switch(config-if)#mvr immediate
Switch(config-if)#exit
Switch(config)# exit
Switch# show mvr interface
Port | Type | Immediate Leave
--------+---------+-----------------
gi1 |     Source|     Disabled
gi2  | Receiver|     Enabled
```

mvr vlan group

Syntax

mvr vlan <VLAN-ID> group <ip-addr> interfaces IF_PORTS
no mvr vlan < VLAN-ID> group <ip-addr> interfaces IF_PORTS

Parameter

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

Default

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
clear mvr members
Gourp IP Address | Type | Life(Sec) | Port
------------------+--------+----------+-----------------
```

```
224.1.1.1 | Static|     --     | gi2

 Total Number of Entry = 1
```

Syntax

clear mvr members [dynamic|static]

Parameter

dynamic	specifies MVR dynamic group
static	specifies MVR static group

Default

Clear all of mvr group

Mode

Privileged EXEC

Usage

This command will clear the mvr groups for selected type.

Example

The following example specifies that clear all mvr groups test.

```
Switch# clear mvr members
```

show mvr members

Syntax

show mvr members

Parameter

Default

Mode

Privileged EXEC

Usage

This command will display the mvr groups for all of type.

Example

The following example specifies that show mvr groups test.

Switch# **show mvr members**

show mvr interface

Syntax

show mvr interface [IF_PORTS]

Parameter

IF_PORTS	Show specifies port list configurationt

Default

Mode

Privileged EXEC

Usage

This command will display mvr port type and port immediate status.

Example

The following example specifies that show mvr interface test.

```
Switch# show mvr interface
```

show mvr

Syntax

show mvr

Parameter

Default

Mode

Privileged EXEC

Usage

This command will display mvr global information.

Example

The following example specifies that show mvr test.

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

21.OSPF

area

Syntax

area [<0-4294967295> | A.B.C.D]
no area [<0-4294967295> | A.B.C.D]

Parameter

<0-4294967295>	OSPF area ID is a decimal value
A.B.C.D	OSPF area ID in IP address format

Default

Mode

OSPF configuration mode

Usage

Use the command "area" to configure the area of OSPF.

Example

Configure OSPF area

```
Switch(config)# ospf 1
Switch(config-ospf-1)# area 0
Switch(config-ospf-1-area-0.0.0.0)#
```

network

Syntax

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

Parameter

A.B.C.D/M	Ospf network prefix

Default

Mode

OSPF area mode

Usage

Use the command "network" to publish the IP routing network of OSPF.

Example

Publish the IP routing network of OSPF

```
Switch(config)# ospf 1
Switch(config-ospf-1)# area 0
Switch(config-ospf-1-area-0.0.0.0)# network 12.1.1.1/24
```

ospf

Syntax

ospf [1]
no ospf [1]

Parameter

1	Process ID

Default

Mode

Global Configuration

Usage

Use the command "OSPF" to enable the OSPF dynamic protocol.

Example

Enable OSPF

```
Switch(config)# ospf 1
Switch(config-ospf-1)#
```

router-id

Syntax

router-id *A.B.C.D*
no router-id

Parameter

A.B.C.D	OSPF router ID in IP address format

Default

Mode

OSPF configuration mode

Usage

use Configure OSPF router ID with the command "router ID"

Example

Configure OSPF router ID

```
Switch(config)# ospf 1
Switch(config-ospf-1)# router-id 1.1.1.1
```

show ospf

Syntax

show ospf

Parameter

Default

Mode

Privileged EXEC
Global Configuration

Usage

Use the command "show OSPF" to query OSPF information.

Example

Querying OSPF information

```
Switch# show ospf
OSPF Process 1, Router ID: 1.1.1.1
Supports only single TOS (TOS0) routes
This implementation conforms to RFC2328
  RFC1583Compatibility flag is disabled
  OpaqueCapability flag is disabled
  Initial SPF scheduling delay 0 millisec(s)
  Minimum hold time between consecutive SPFs 50 millisec(s)
  Maximum hold time between consecutive SPFs 5000 millisec(s)
  Hold time multiplier is currently 1
  SPF algorithm has not been run
  SPF timer is inactive
  LSA minimum interval 0 msecs
  LSA minimum arrival 0 msecs
  Write Multiplier set to 0
  Refresh timer 10 secs
  Number of external LSA 0. Checksum Sum 0x00000000
  Number of opaque AS LSA 0. Checksum Sum 0x00000000
  Number of areas attached to this router: 1
  Area ID: 0.0.0.0 (Backbone)
  Number of interfaces in this area: Total: 0, Active: 0
Number of fully adjacent neighbors in this area: 0
Area has no authentication
SPF algorithm executed 0 times
Number of LSA 0
Number of router LSA 0. Checksum Sum 0x00000000
Number of network LSA 0. Checksum Sum 0x00000000

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
```

show ospf database

Syntax

show ospf database

Parameter

Default

Mode

Privileged EXEC
Global Configuration

Usage

Use the command "show OSPF database" to query OSPF database summary information.

Example

Querying OSPF database summary information

```
Switch# show ospf database

          OSPF Process 1 with Router ID :1.1.1.1
                   Database information:
```

show ospf neighbor

Syntax

show ospf neighbor

Parameter

Default

Mode

Privileged EXEC
Global Configuration

Usage

Use the command "show OSPF neighbor" to query OSPF neighbor information.

Example

Querying OSPF neighbor information

Switch# **show ospf neighbor**

```
          OSPF Process 1 with Router ID :1.1.1.1
                    neighbors:

Type: D - Dynamic, S - Static
Type   Neighbor ID      Pri State           Dead Time Address        Interface       RXmtL RqstL DBsmL
```

22.POE

POE

Syntax

poe
no poe

Parameter

Default

All ports are enabled for poe power supply by default. (Poe-enabled device)

Mode

interface configuration.

Usage

Use the **poe** command in interface mode to enable port poe power supply.
Use the **no poe** command in interface mode to disable port poe power supply.
You can check the port poe working status by using the **show poe** Privileged EXEC command.

Example

The following example shows how to config poe.

```
Switch(config)# interface GigabitEthernet 1
Switch(config-if)# poe
Switch# show poe
  Get poe power:

  Port   |   Enable | State | type | level | actual-     | volatge(V) | current(mA)
         |          |       |      |       | power(mW) |            |
--------+---------+-------+------+-------+-----------+------------+------------
  gi1        enable      on      AT        4         676          52          13
  gi2        enable     off     AF       0        N/A         N/A         N/A
  gi3        enable     off     AF       0        N/A         N/A         N/A
  gi4        enable     off     AF       0        N/A         N/A         N/A
  gi5        enable     off     AF       0        N/A         N/A         N/A
  gi6        enable     off     AF       0        N/A         N/A         N/A
  gi7        enable     off     AF       0        N/A         N/A         N/A
  gi8        enable     off     AF       0        N/A         N/A         N/A

  Total used power: 676 (mW)
  Current Temperature: 65 (C)
```

poe reboot

Syntax

poe reboot *HH:MM:SS* **delay** *HH:MM:SS*
no poe reboot

Parameter

HH:MM:SS	Set the time for POE port restart and delay startup. The minimum granularity is to minutes

Default

Mode

interface configuration.

Usage

Use the command "Poe reboot" to set the POE port restart, turn off the POE power supply by setting the restart time, and reset the power supply by setting the delay time. Using this function, you need to synchronize the system time first.

Poe function only supports Poe managed switches of the same series, but not non Poe managed switches.

Example

Set interface Poe watchdog

```
Switch(config)# interface GigabitEthernet 1
Switch(config-if)# poe reboot 12:05:00 delay 00:05:00
```

poe schedule

Syntax

poe schedule week *days* **hour** *hours*
no poe schedule week *days* **hour** *hours*

Parameter

days	Port poe power supply days
hours	Port poe power supply hours

Default

All ports open POE function all day by default. (Poe-enabled device)

Mode

interface configuration.

Usage

Use the **poe schedule** command in interface mode to set port poe power supply time.

Use the **no poe schedule** command in interface mode to clear port poe power supply time..

You can check the port poe work time setting view through the web.

Example

The following example shows how to config poe schedule.

```
Switch(config)# interface GigabitEthernet 1
Switch(config-if)# poe schedule week mon hour 1
```

Note: The configured time has a deviation of about 0~10 minutes.

poe watch-dog

Syntax

poe watch-dog
no poe watch-dog

Parameter

Default

The default Poe watchdog is off.

Mode

interface configuration.

Usage

Use the command "Poe watch dog" to set the port Poe watchdog function.
Poe function only supports Poe managed switches of the same series, but not non Poe managed switches.

Example

Set interface Poe watchdog

```
Switch(config)# interface GigabitEthernet 1
Switch(config-if)# poe watch-dog
```

show poe

Syntax

show poe

Parameter

Default

Mode

Privileged EXEC

Usage

Use the command "show Poe" to query the POE function of the system.
Poe function only supports Poe managed switches of the same series, but not non Poe managed switches.

Example

Querying Poe configuration

Switch# **show poe**

```
Get poe power:

Port   |   Enable | State | type | level | actual-     | volatge(V) | current(mA)
       |              |          |        |          | power(mW) |                    |
--------+---------+-------+------+-------+-----------+------------+-------------
gi1        enable      on     AT       4          676             52              13
gi2        enable     off     AF       0         N/A            N/A             N/A
gi3        enable     off     AF       0         N/A            N/A             N/A
gi4        enable     off     AF       0         N/A            N/A             N/A
gi5        enable     off     AF       0         N/A            N/A             N/A
gi6        enable     off     AF       0         N/A            N/A             N/A
gi7        enable     off     AF       0         N/A            N/A             N/A
gi8        enable     off     AF       0         N/A            N/A             N/A

Total used power: 676 (mW)
Current Temperature: 65 (C)
```

23.Port Mirror

mirror session source interface

Syntax

mirror session <1-4> **source interfaces** *IF_PORTS* (**both** | **rx** | **tx**)
no mirror session <1-4> **source interfaces** *IF_PORTS* (**both** | **rx** | **tx**)
no mirror session (<1-4> | **all**)

Parameter

<1-4>	Specify the mirror session to configure
IF_PORTS	Specify the source interface, Valid interfaces include physical ports and port channels.
both	Mirror tx and rx direction
rx	Mirror rx direction only
tx	Mirror tx direction only

Default

No monitor sessions are configured.

Mode

Global Configuration

Usage

Use the “**mirror session source interface”** command to start a port mirror session.
Use the **no** form of this command to stop a port mirroring session.
Use the “**no mirror session**” command to disable all mirror sessions or specific mirror session.

Example

The following example shows how to create a local SPAN session 1 to monitor both sent and received traffic on source port fa1.

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

mirror session destination interface

Syntax

mirror session <1-4> **destination interface** *IF_NMLPORT* [**allow-ingress**]
no mirror session <1-4> **destination interface** *IF_NMLPORT*
no mirror session (<1-4> | **all**)

Parameter

<1-4>	Specify the mirror session to configure
IF_NMLPORT	Specify the SPAN destination. A destination must be a physical port

allow-ingress	Enable ingress traffic forwarding.

Default

No monitor sessions are configured.

Mode

Global Configuration

Usage

Use the “**mirror session destination interface”** command to start a destination interface of a port mirror session.
Use the **no** form of this command to stop a destination interface of a port mirroring session.
Use the “**no mirror session**” command to disable all mirror sessions or specific mirror session.

Example

The following example shows how to create a local session 1 to monitor both sent and received traffic on source port fa1.

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

show mirror

Syntax

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

Parameter

<1-4>	Specify the mirror session to display

Default

Mode

Privileged EXEC

Usage

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

Example

This following example shows how to display mirror session configuration

```
Switch#show mirror session 1
Session 1 Configuration Source
RX Port         : gi2-5
Source TX Port          : gi2-5
Destination port        : gi1
Ingress State: disabled
```

24.Port

description

Syntax

description *WORD<1-32>*
no description

Parameter

WORD<1-32>	Specifiy port description string.

Default

Default port description is empty.

Mode

Interface Configuration

Usage

Use "**description**" command to give the port a name to identify it easily.
If description includes space character, please use double quoted to wrap it. Use **no** form to restore description to empty string.

Example

This example shows how to modify port descriptions.

```
Switch(config)# interface gi1
Switch(config-if)# description "uplink port"
```

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

```
Switch# show interfaces gi1 status
Port   Name          Status      Vlan   Duplex   Speed     Type
gi1    uplink port     connected    1    a-full   a-10M     Copper
```

speed

Syntax

speed (**10** | **100** | **1000**)
speed auto [(**10** | **100** | **1000** | **10/100**)]
speed nonegtiate
no speed nonegtiate

Parameter

10	Specify port speed to force 10Mbits/s or auto with 10Mbits/s ability.
100	Specify port speed to force 100Mbits/s or auto with 100Mbits/s ability.
1000	Specify port speed to force 1000Mbits/s or auto with 1000Mbits/s ability.
10/100	Specify port speed to auto with 10Mbits/s and 100Mbits/s

Default

Default port speed is auto with all available abilities.

Mode

Interface Configuration

Usage

Use “**speed**” command to change port speed configuration. The speed is only able to configure to the physical maximum speed. For example, in fast Ethernet port, speed 1000 is not available.

You cannot configure the speed on the SFP module ports, but you can configure the speed to not negotiate (nonegotiate) if it is connected to a device that does not support autonegotiation.

Example

This example shows how to modify port speed configuration.

```
Switch(config)# interface 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

      gi1             notconnect   1      auto     100M       Copper
      gi2             notconnect   1      auto     auto      Copper
```

duplex

Syntax

duplex (**auto** | **full** | **half**)

Parameter

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

Default

Default port duplex is auto.

Mode

Interface Configuration

Usage

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

Example

This example shows how to modify port duplex configuration.

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

This example shows how to show current speed configuration

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

This example shows how to show current interface link speed

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

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

shutdown

Syntax

shutdown
no shutdown

Parameter

Default

Default port admin state is no shutdown.

Mode

Interface Configuration

Usage

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

Example

This example shows how to modify port duplex configuration.

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

This example shows how to show current admin state configuration

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

This example shows how to show current link status

```
Port      Name     Status   Vlan      Duplex  Speed   Type

fa1                disable  1         full    auto    Copper
```

flowcontrol

Syntax

flowcontrol (**auto** | **off** | **on**)
no flowcontrol

Parameter

auto	Automatically enables or disables flow control on the interface.
off	Disable port flow control.
on	Enable port flow control.

Default

Default port flow control is off.

Mode

Interface Configuration

Usage

Use “**flowcontrol**” command to change port flow control configuration.
Use **no** form to restore flow control to default (off) configuration.

Example

This example shows how to modify port duplex configuration.

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

This example shows how to show current flow control configuration

```
Switch# show interfaces fa1
Hardware is Fast Ethernet
Full-duplex, Auto-speed, media type is Copper
flow-control is on
0 packets input, 0 bytes, 0 throttles Received 0 broadcasts (0 multicasts)
0 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
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-frmae size

```
Switch# show running-config
      jumbo-frame 9216
```

protected

Syntax

protected
no protected

Parameter

Default

Default protected state is no protected.

Mode

Interface Configuration

Usage

Use “**protected**” command to make port to be protected. Protected port is only allowed to communicate with unprotected port. In other words, protected port is not allowed to communicate with another protected port.

Use **no** form to make port unprotected.

Example

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

```
Switch(config)# interface range fa1-2
Switch(config-if-range)# protected
```

This example shows how to show current protected port state.

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

eee

Syntax

eee
no eee

Parameter

Default

Default eee state is disabled.

Mode

Interface Configuration

Usage

Use “**eee**” command to make port to enable the energy efficient Ethernet feature.
Use **no** form of this command to disable eee.
The only way to show this configuration is using “**show running-config**” command.

Example

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

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

This example shows how to show current jumbo-frmae size

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

clear interface

Syntax

clear interfaces *IF_PORTS* **counters**

Parameter

IF_PORTS	Specify port to clear counters.

Default

No default value for this command.

Mode

Privileged EXEC

Usage

Use “**clear interface**” command to clear statistic counters on specific ports.

Example

This example shows how to clear counters on port fa1.

```
Switch(config)# clear interfaces 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
```

show interface

Syntax

show interfaces *IF_PORTS*
show interfaces *IF_PORTS* **status**
show interfaces *IF_PORTS* **potected**

Parameter

IF_PORTS	Specifiy port to show.

Default

No default value for this command.

Mode

Privileged EXEC

Usage

Use “**show interface**” command to show detail port counters, parameters and status.
Use “**show interface status**” command to show brief port status.
Use “**show interface protected**” command to show protected status.

Example

This example shows how to show current counters

```
Switch# show interfaces 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
```

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 status
Port Name    Status   Vlan Duplex Speed          Type
fa1          connected       1        full     a-100M Copper
```

25.Port Error Disable

errdisable recovery cause

Syntax

errdisable recovery cause (**all**|**acl**|**arp-inspection**|**bpduguard**|**broadcast- flood**|**dhcp-rate limit**|**psecure-violation**|**selfloop**|**unicast-flood**|**unknown-multicastflood**)
no errdisable recovery cause (**all**|**acl**|**arp-inspection**|**bpduguard**|**broadcast- flood**|**dhcp-rate-limit**|**psecure-violation**|**selfloop**|**unicast-flood**|**unknown- multicastflood**)

Parameter

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

Default

Error disable recovery is disabled for all cause.

Mode

Global Configuration

Usage

Ports would be disabled because of the invalid actions detected by protocols. To enable the port error disable recovery from the specific cause, use the command **errdisable recovery cause** in the Global Configuration mode.

Example

The following example enables the port error disable recovery for the STP BPDU Guard and self-loog cause.

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

errdisable recovery cause udld

Syntax

errdisable recovery cause udld
no errdisable recovery cause udld

Parameter

Default

Default is disabled

Mode

Global Configuration

Usage

Use the command "errdisable recovery cause UDLD" to enable automatic recovery of one-way link detection (UDLD).

Example

Configuring the errdisable function of UDLD

```
switch(config)# errdisable recovery cause udld
switch# show errdisable recovery
ErrDisable Reason Timer Status
```

```
-------------------------+--------------
bpduguard    | disabled
udld | enabled
...
```

errdisable recovery interval

Syntax

errdisable recovery interval *seconds*

Parameter

seconds	The time in seconds to recover from a specific error-disable state. The vaild range is 0 to 86400 seconds,and the default value is 300 seconds.

Default

The default recovery time is 300 seconds.

Mode

Global Configuration

Usage

To set the recovery time of the error disabled ports, use the command **errdisable recovert interval** in the Global Configuration mode.

Example

The following example set the agimg time to 500 seconds.

```
Switch(config)# errdisable recovery interval 60
```

show errdisable recovery

Syntax

show errdisable recovery

Parameter

Default

Mode

Privileged EXEC

Usage

To show the error disable configuration and the interfaces in the error disabled state, use the command **show errdisable recovery** in the Privileged EXEC mode.

Example

The following example shows the error disable configuration, and the interfaces in the error disabled state.

```
Switch# show errdisable recovery
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
-----+--------------------------+------------
```

26 .Port Security

port-security (Global)

Syntax

port-security
no port-security

Parameter

Default

Default is disabled

Mode

Global Configuration

Usage

The "**port-security**" command enables the port security functionality globally.
Use the **no** form of this command to disable.
You can verify settings by the **show port-security** command.

Example

The following example shows how to enable port security

```
switch(config)# port-security
switch# show port-security
   port-security is: Enabled
```

port-security (Interface)

Syntax

port-security
no port-security

Parameter

Default

Default is disabled

Mode

Port Configuration

Usage

The “**port-security**” command enables the port security functionality on this port.
Use the **no** form of this command to disable
You can verify settings by the **show port-security interface** command.

Example

The following example shows how to enable port security on interface fa1

```
switch(config)# interface fa1
switch(config-if)# port-security
switch(config)# show port-security interfaces gi1
Port    |   Security        | CurrentAddr |   Action
--------+-------------------+---------------+----------------------
gi1   |   Enabled (     1)   |          0          |          Discard
```

port-security address-limit

Syntax

port-security address-limit <1-256>
port-security violation (protect | restrict |shutdown)
no port-security address-limit
no port-security violation

Parameter

<1-256>	The learning-limit number. It specifies how many MAC addresses this port can learn.
protect	Discard new MAC data frame when MAC learning exceeds the limit.
restrict	When MAC learning exceeds the limit, new MAC data frames

	are forwarded and counted.
shutdown	Shutdown this port when receives a packet whose SMAC is new to system and exceed the learning limit number.

Default

The address-limit default is 1 and action is “drop”.

Mode

Port Configuration

Usage

Use the “**port-security address-limit**” command to set the learning-limit number and the violation action.
Use the **no** form of this command to restore the default settings.
You can verify settings by the **show port-security interface** command.

Example

The following example shows how to enable port security on port 1 and set the learning limit number to 10.

```
switch(config)# interface gi1
switch(config-if)# port-security address-limit 10 action discard
switch(config-if)# port-security
switch(config)# show port-security interfaces gi1
Port  Status      MaxAddr  TotalAddr  ConfigAddr  Violation   Action
----- ----------- -------- ---------- ----------- ----------- ---------
gi1   Up            10       0          0           0             Protect
```

show port-security

Syntax

show port-security

Parameter

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 gi1.

```
Switch# show port-security interfaces gi1
Port  Status     MaxAddr  TotalAddr   ConfigAddr  Violation   Action
----- ---------- -------- ----------- ----------- ----------- ---------
gi1   Up           10       0           0           0            Protect
```

27. 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   |     --   |       --
4| Disabled   |     --   |       --
5| Disabled   |     --   |       --
6| Disabled   |     --   |       --
7| Disabled   |     --   |       --
```

vlan protocol-vlan group (Interface)

Syntax

vlan protocol-vlan group <1-8> **vlan** <1-4094>

no vlan protocol-vlan group <1-8>

Parameter

<1-8>	Specify protocol vlan group to binding
<1-4094>	Specifies the Proto VLAN ID to configure.

Default

In default all group are not binding to any interface.

Mode

Interface configuration

Usage

Use the **vlan protocol-vlan binding** Interface Configuration mode command to binding protocol VLAN Group on specified interfaces,
Use the **no** form of this command to cancel protocol VLAN Group Binding. You can verify your setting by entering the **show vlan protocol-vlan interfaces IF_PORTS Privileged EXEC** command

Example

The following example how to configure Protocol VLAN function on specified interfaces..

```
Switch(config)# interface gi1
Switch(config-if)# vlan protocol-vlan group 1 vlan 2
```

show vlan protocol-vlan

Syntax

show vlan protocol-vlan [group <1-8>**]**

Parameter

<1-8>	Specify protocol vlan group to display

Default

Mode

Privileged EXEC

Usage

Use the **show vlan proto-vlan** command in EXEC mode to display Proto VLAN group configuration

Example

The following example how to display Proto VLAN group configuration Switch# **show vlan protocol-vlan**

```
Group ID       |    Status   |    Type      |        value
---------------+--------------------+---------------------+-----------------
1| Enabled    |   Ethernet   |     0x0806
2| Enabled    |     LLC other |     0x0800
3| Disabled    |       --      |       --
4| Disabled    |       --      |       --
5| Disabled    |       --      |       --
6| Disabled    |       --      |       --
7| Disabled    |       --      |       --
8| Disabled    |       --      |       --
```

show vlan protocol-vlan interfaces

Syntax

show vlan protocol-vlan interfaces IF_PORTS

Parameter

IF_PORTS	Specify interfaces protocol vlan to display

Default

Mode

Privileged EXEC

Usage

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

Example

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

```
Switch# show vlan protocol-vlan interfaces fa1
Port fa1 : Group 1
```

```
Status : Enabled VLAN ID : 2
Group 2
Status : Enabled VLAN ID : 3
Group 3
Status        : Disabled
Group 4
Status        : Disabled
Group 5
Status        : Disabled
Group 6
Status        : Disabled
Group 7
Status        : Disabled
Group 8
Status        : Disabled
```

28. QOS

qos

Syntax

qos
no qos

Parameter

Default

Default qos is disabled.

Mode

Global Configuration

Usage

Use “**qos**” command to enable quality of service which according to basic trust type to assign queue for packets, and packets with higher priority are able to send first.
Use no form of this command to disable quality of service.

Example

This example shows how to change qos to basic mode.

```
Switch(config)# qos basic
```

This example shows how to check current qos mode.

```
Switch# show qos
QoS Mode: basic
Basic trust: cos
```

qos cos

Syntax

qos cos *<0-7>*

Parameter

cos <0-7>	Specify the CoS value for the interface.

Default

Default CoS value for interface is 0.

Mode

Interface Configuration

Usage

Sometimes, there is no qos information in the packets, such as CoS, DSCP, IP Precedence. But we still can give the priority for packets by configuring the interface default cos value. If there is no qos information in the packets, the device will use this default cos value and find the cos-queue map to get the final destination queue.

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

Example

This example shows how to configure default cos value 7 on interface gi1.

```
Switch(config)# interface GigabitEthernet 1
Switch(config-if)# qos cos 7
Switch(config-if)# end
Switch# show qos interface GigabitEthernet 1
Port | CoS     | Trust State | Remark Cos | Remark DSCP | Remark IP Prec
--------+-------+---------------+------------+-------------+---------
gi1 |  7         |          enabled |          disabled |          disabled | disabled |
```

qos map

Syntax

qos map (**cos-queue** | **dscp-queue** | **precedence-queue**) *SEQUENCE* **to** *<1-8>*
qos map (**queue-cos** | **queue-precedence**) *SEQUENCE* **to** *<0-7>*
qos map queue-dscp *SEQUENCE* **to** *<0-63>*

Parameter

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

Default

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

CoS	Queue ID
0	1
1	2

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	0
2	1
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
```

```
------------------------------
CoS     1   0   2   7   7   5   6   7
```

qos queue

Syntax

qos queue strict-priority-num *<0-8>*
qos queue weight *SEQUENCE*

Parameter

strict-priority- num <0-8>	Specify the strict priority queue number
Weight SEQUENCE	Specify the non-strict priority queue weight value. The valid queue weight value is from 1 to 127.

Default

Default strict priority queue number is 8, it means all queues are strict priority queue.

The default queue weight for each queue is shown in following table.

Queue ID	**Queue Weight**
1	1
2	2
3	3
4	4
5	5
6	9
7	13
8	15

Mode

Global Configuration

Usage

The device support total 8 queues for QoS queueing. It is able to set the queue to be strict priority queue or weighted queue to prevent starvation. The queue with higher id value has higher priority. First, you need to decide how many strict priority queue you need. The strict priority queue will always occupy the higher priority queue. For example, if you specify the strict priority number to be 2, then the queue 7 and 8 will be the strict priority queues and the others are weighted queues. After you setup the number of strict priority queue, you need to setup the weight for the weighted queues by using "qos queue weight" command. And the bandwidth will shared by the weight you configured between these weighted queues.

Example

This example shows how to setup device with 3 strict priority queues and give other weighted queues with weight 5, 10, 15, 20, 25.

```
Switch(config)# qos queue strict-priority-num 3
Switch(config)# qos queue weight 5 10 15 20 25
Switch# show qos queueing
qid-weights  Ef - Priority
1         -  5      dis- N/A
2         -  10     dis- N/A
3         -  15     dis- N/A
4         -  20     dis- N/A
5         -  25     dis- N/A
6         - N/A     ena- 6
7         - N/A     ena- 7
8         - N/A     ena- 8
```

qos remark

Syntax

qos remark (cos | dscp | precedence)
no qos remark (cos | dscp | precedence)

Parameter

cos	Enable/Disable cos remarking.
dscp	Enable/Disable dscp remarking.
precedence	Enable/Disable precedence remarking.

Default

Default CoS remarking is disabled.
Default DSCP remarking is disabled.

Default IP Precedence remarking is disabled.

Mode

Interface Configuration

Usage

QoS remarking feature allow you to change priority information in packets based on egress queue. For example, you want all packets egress from interface fa1 queue 1 to remark the cos value to be 5 for next tier of device, you can enable the cos remarking feature on fa1 and configure the queue-cos map for queue 1 map to cos 5.

Use "**qos remark**" command to enable remarking feature on specific type. And use "**no qow remark**" command to disable it.

Example

This example shows how to enable remarking features on interface fa1.

```
Switch(config)# interface GigabitEthernet 1
Switch(config-if)# qos remark cos
Switch(config-if)# qos remark dscp
Switch(config-if)# qos remark precedence
Switch(config-if)# end
Switch# show qos interface GigabitEthernet 1
Port | CoS  | Trust State | Remark Cos | Remark DSCP | Remark IP Prec
--------+-------+---------------+------------+-------------+-------
gi1 |         0     |         enabled |         enabled |         enabled | enabled |
```

qos trust

Syntax

qos trust (**cos** | **cos-dscp** | **dscp** | **precedence**)

Parameter

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

precedence	Specify the device to trust IP Precedence

Default

Default QoS trust type is cos.

Mode

Global Configuration

Usage

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

CoS:

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

DSCP:

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

IP Precedence:

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

CoS-DSCP:

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

Example

This example shows how to change qos basic mode trust types.

```
Switch(config)# qos trust cos
Switch(config)# qos trust cos-dscp
Switch(config)# qos trust dscp
Switch(config)# qos trust precedence
```

This example shows how to check current qos trust type.

```
Switch# show qos
QoS Mode: basic
Basic trust: ip-precedence
```

qos trust (Interface)

Syntax

qos trust
no qos trust

Parameter

Default

Default interface qos trust state is enabled.

Mode

Interface Configuration

Usage

After QoS function is enabled in basic mode, the device also support per interface enable/disable the qos function. If the trust state on interface is enabled, all ingress packets of this interface will remap according to the trust type and the qos maps. Otherwise, all ingress packets will assign to queue 1.

Use “**qos trust**” to enable trust state on interface and use “**no qos trust**” to disable trust state on interface.

Example

This example shows how to disable qos trust state on interface gi1.

```
Switch(config)# interface GigabitEthernet 1
Switch(config-if)# no qos trust
Switch(config-if)# end
Switch# show qos interface GigabitEthernet 1
Port | CoS  | Trust State | Remark Cos | Remark DSCP | Remark IP Prec
--------+-------+---------------+------------+-------------+----------
gi1 |        0          |          disabled |         disabled |         disabled | disabled |
```

show qos

Syntax

show qos

Parameter

Default

No default value for this command.

Mode

Privileged EXEC

Usage

Use “**show qos**” command to show qos state and trust type.

Example

This example shows how to check current qos mode.

```
Switch# show qos
QoS Mode: basic
Basic trust: cos
```

show qos interface

Syntax

show qos interface *IF_PORTS*

Parameter

IF_PORTS	Select port to show qos configurations.

Default

No default value for this command.

Mode

Privileged EXEC

Usage

Use “**show qos interfaces**” command to show port default cos ,remarking state and remarking type state informations.

Example

This example shows how to show qos configurations on interface fa1.

```
Switch# show qos interface GigabitEthernet 1
Port | CoS  | Trust State | Remark Cos | Remark DSCP | Remark IP Prec
--------+-------+---------------+------------+-------------+-------
gi1 |        7  |          enabled |          disabled |          disabled | disabled |
```

show qos map

Syntax

show qos map [(**cos-queue** | **dscp-queue** | **precedence-queue** | **queue-cos** |**queue-dscp** | **queue-precedence**)]

Parameter

cos-queue	Show CoS to queue map.
dscp-queue	Show DSCP to queue map.
precedence-queue	Show IP Precedence to queue map.
queue-cos	Show queue to CoS map.
queue-dscp	Show queue to DSCP map.
queue-precedence	Show queue to IP Precedence map.

Default

No default value for this command.

Mode

Privileged EXEC

Usage

Use “**show qos map**” command to show all kinds of mapping for qos remapping and remarking features.

Example

This example shows how to show all qos maps.

```
Switch# show qos map queue-cos
 Queue to CoS mappings
 Queue      1      2      3      4      5      6      7      8
 ---------------------------------------------------------
 CoS        1      0      2      7      7      5      6      7
```

show qos queueing

Syntax

show qos queueing

Parameter

Default

No default value for this command.

Mode

Privileged EXEC

Usage

Use “**show qos queueing**” command to show qos queueing information.

Example

This example shows how to check current qos queueing information.

```
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
```

29.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 gi1
Switch(config-if)# rate-limit egress 2048
Switch# show running-config interfaces gi1
interface gi1
  rate-limit egress 2048
```

rate-limit ingress

Syntax

rate-limit ingress <16-1000000>
no rate-limit ingress

Parameter

<16-1000000>	Specify the ingress limit rate
<1-8>	Specify the egress shaper queue number

Default

Rate limiting is disabled.

Mode

Interface configuration

Usage

Use the “**rate-limit ingress**” command to limit the incoming traffic rate on a port.
Use the **no** form of this command to disable the rate limit.
You can verify your setting by entering the **show running-config interfaces** command

Example

The following example show how to configure ingress port rate limit.

```
Switch(config)# interfaces gi1
Switch(config-if)# rate-limit ingress 128
Switch# show running-config interfaces gi1
interface gi1
    rate-limit ingress 128
```

rate limit egress queue

Syntax

rate-limit egress queue <1-8> <16-1000000>
no rate-limit egress queue <1-8>

Parameter

<1-8>	Specify the egress shaper queue number
<16-1000000>	Specify the queue rate.

Default

Default queue rate limit is disabled.

Mode

Interface configuration

Usage

Use the “**rate-limit egress queue**” command to configure the egress queue shaper.
Use the **no** form of this command to disable the queue shaper.
You can verify your setting by entering the **show running-config interfaces** command.

Example

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

```
Switch(config)# interfaces gi1
Switch(config-if)# rate-limit egress queue 3 2048
Switch# show running-config interfaces gi1
interface gi1
rate-limit egress queue 3 2048
```

30.RIP

rip

Syntax

rip
no rip

Parameter

Default

Mode

Global Configuration

Usage

Use the command "rip" to enable the rip routing protocol.

Example

Enable rip routing protocol

```
Switch(config)# rip
```

network

Syntax

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

Parameter

A.B.C.D/M	ip prefix < Network > / < length >, for example, 10.0.0.0/8

Default

Mode

Rip mode

Usage

Use the command "**network**" to enable routing on the IP network.

Example

Enable IP network routing

```
Switch(config)# rip
Switch(config-rip)# network 12.0.0.0/8
```

version

Syntax

version 1 | 2
no version

Parameter

1	Rip protocol version 1
2	Rip protocol version 2

Default

RIP protocol uses version 2 by default

Mode

Rip mode

Usage

Use the command "**version**" to configure the version of the RIP protocol.

Example

Configure RIP Protocol Version

```
Switch(config)# rip
Switch(config-rip)# version 2
```

show rip

Syntax

show rip

Parameter

Default

Mode

Privileged EXEC

Usage

Use the command "show rip" to query rip information.

Example

Query RIP information

```
Switch# show rip

    Rip status          : on
    Rip version         : V2 (send V2, receive V1/2)
    Updates time        : 30 sec
    Age    time         : 180 sec
    Garbage-collect time    : 120 sec
    Default redistribution metric : 1
    Routing for Networks:
```

31.SNMP

snmp

Syntax

snmp

Parameter

Default

SNMP is disabled by default

Mode

Global Configuration

Usage

To enable the SNMP on the switch, use the command **snmp** in the Global Configuration mode. Otherwise, use the **no** form of the command to disable to SNMP.

Example

The following example enables the SNMP.

```
Switch(config)# snmp
```

snmp view

Syntax

snmp view *view-name* **subtree** *oid-tree* **oid-mask** (**all**|*oid-mask*) **view type** (included|excluded)
no snmp view *view-name* **subtree** (**all**|*oid-tree*)

Parameter

view-name	The SNMP view name. Its maximum length is 30 characters.

subtree *oid-tree*	Specify the ASN.1 subtree object identifier (OID) to be included or excluded from the SNMP view.
oid-mask (**all**|*oid- mask*)	Specify the OID family mask. It is used to define a family of view subtrees. For example, OID mask FA.80 is is 11111010.10000000. The length of the OID mask must be less than the length of subtree OID.
iewtype(**included**|**excluded**)	Include or exclude the selected MIBs in the view.

Default

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
```

snmp group

Syntax

snmp group *group-name* **(1 | 2c | 3) (noauth|auth|priv) read-view** *read-view*
write-view *write-view* **[notify-view** *notify-view***]**
no snmp group *group-name security-mode version* **(1 | 2c | 3)**

Parameter

group-name	Specify SNMP group name, and the maximum length is 30 characters.
(**1**|**2c**|**3**)	Specify the SNMP version.
noauth	Specify that no packet authentication is performed.
auth	Specify that no packet authentication without entryption is performed. It is applicable only to the SNMPv3 security mode.
priv	Specify that no packet authentication with entryption is performed. It is applicable only to the SNMPv3 security mode.
read-view *read- view*	Set the view name that enables configuring the agent, and its maximum length is 30 characters.
write-view *write-view*	Set the view name that enables viewing only, and its maximum length is 30 characters.
notify-view *notify-view*	Sets the view name that sends only traps with contents that is included in SNMP view selected for notification.The maximum length is 30 characters.

Default

No group entry is existed.

Mode

Global Configuration

Usage

To define the SNMP group, use the command **snmp group** in the Glocal Configuration mode, and use the **no** form of the command to delete the configuration.

SNMP group configuration is used in the command **snmp use** to map SNMP users to the SNMP group. These users would be automatically maped to the SNMP views defined in this command.

The securety level for SNMP v1 or v2 is always **noauth**.

Example

The following example adds SNMPv3 group

```
Switch(config)# snmp group v3 version 3 auth read-view all write-view all
notify-view all
```

snmp community

Syntax

snmp community *community-name* [**view** *view-name*] (**ro**|**rw**)
snmp community *community-name* **group** *group-name*
no snmp community *community-name*

Parameter

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

Default

No SNMP community is configured

Mode

Global Configuration

Usage

To define the SNMP community that permit access for SNMP v1 and v2, use the command **snmp community** in the Global Configuration mode.

Example

The following example defines the SNMP community named *private* with the default view *all*, and the access right is *read-only*.

```
Switch(config)# snmp community private ro
```

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*

Parameter

username	Specify the SNMP user name on the host that connects to the SNMP agent. The max character is 30 characters. For the SNMP v1 or v2c, the user name must match the community name by the command **snmp host**.
group-name	Specify the SNMP group to which the SNMP user belongs. The SNMP group should be SNMPv3 and configured by the command **snmp group**.
auth (**md5**|)	Specify the HMAC-MD5-96 authentication protocol as the user authentication.
auth (**sha**|)	Specify the HMAC-SHA-96 authentication protocol as the user authentication.
AUTHPASSWD	The password for authentication and the range of length is from 8 to 32 characters.
Priv *PRIVPASSWD*	The private password for the privacy key, and the range of length is from 8 to 64 characters.

Default

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 engineid

Syntax

snmp engineid (**default**|*ENGINEID*)

Parameter

default	Default engine ID generated on the basis of the switch MAC address.
ENGINEID	Specify SNMP engine ID. The engine ID is the 10 to 64 hexadecimal characters, and the hexadecimal number must be divided by 2.

Default

The default SNMP engine ID on the switch is based on switch MAC address.

Mode

Global Configuration

Usage

To define the SNMP engine on the switch, use the command s**nmp engineid** in the Global Configuration mode.

Example

The following example configure the switch SNMP engine ID

```
Switch(config)# snmp engineid 00036D001122
```

snmp engineid remote

Syntax

snmp engineid remote (*ip-addr|ipv6-addr*) *ENGINEID*
no snmp engineid remote (*ip-addr|ipv6-addr*)

Parameter

ENGINEID	Specify SNMP engine ID. The engine ID is a 10 to 64 hexadecimal characters, and the hexadecimal number must be divided by 2.
ip-addr	IP address of the remote host
ipv6-addr	IPv6 address of the remote host

Default

Mode

Global Configuration

Usage

To define the remote host for SNMP engine, use the command s**nmp 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 trap

Syntax

snmp trap (auth|cold-start|linkUpDown|port-security|warm-start)
no snmp trap (auth|cold-start|linkUpDown|port-security|warm-start)

Parameter

auth	Enable the SNMP authentication failure trap.
cold-start	Enable the SNMP cold start-up failure trap.
linkUpDown	Enable the SNMP link up and down failure trap.
port-security	Enable the SNMP port security trap.
warm-start	Enable the SNMP warm start-up failure trap.

Default

All the SNMP traps are enabled.

Mode

Global Configuration

Usage

To send the SNMP traps, use the command snmp trap in the Global Configuration mode; and use the no form of the command to disable the SNMP traps.

Example

The following example disables and enables the SNMP link up and down traps individually.

```
Switch(config)# no snmp trap linkUpDown
Switch(config)# snmp trap linkUpDown
```

snmp host

Syntax

snmp host (*ip-addr*|*ipv6-addr*|*hostmane*) [**traps**|**informs**] [**version** (**1**|**2c**)] *community-name* [**udp-port** *udp-port*] [**timeout** *timeout*] [**retries** *retries*]
snmp host (*ip-addr*|*ipv6-addr*|*hostmane*) [**traps**|**informs**] **version 3** [(**auth**|**noauth**|**priv**)] *community-name* [**udp-port** *udp-port*] [**timeout***timeout*] [**retries** *retries*]

no snmp host (*ip-addr*|*ipv6-addr*|*hostmane*) **[traps|informs] [version (1|2c|3)]**

Parameter

ip-addr	The IP adderss of recipet.
ipv6-addr	The IPv6 adderss of recipet.
hostname	The host name of recipet.
traps	Send SNMP traps to the host. It is the default action.
informs	Send SNMP informs to the host.
version (**1**|**2c**|**3**)	Specify the SNMP version.
noauth	Specify that no packet authentication is performed. It is applicable only to the SNMPv3 security mode.
auth	Specify that no packet authentication without entryption is performed. It is applicable only to the SNMPv3 security mode.
priv	Specify that no packet authentication with entryption is performed. It is applicable only to the SNMPv3 security mode.
community-name	The SNMP community sent with the notification.
udp-port *udp-port*	Specify the UDP port number.
timeout *timeout*	Specify the SNMP informs timeout.
retries *retries*	Specify the retry counter of the SNMP informs.

Default

No SNMP host is configured.
The default SNMP version for the command is SNMPv1.

Mode

Global Configuration

Usage

To configure the hosts to receive SNMP notificatons, use the command **snmp host** in the Global Configuration mode; and use the **no** form of the command to delete the configuration.

Example

The following example adds the recipet *192.168.1.11* for the SNMP traps notification.

```
Switch(config)# snmp host 192.168.1.11 private
```

show snmp view

Syntax

show snmp view

Parameter

Default

Mode

Privileged EXEC

Usage

To show the SNMP view defined on the switch, use the command **show snmp view** in the Privileged EXEC mode.

Example

The following example shows the configuration of SNMP view.

```
Switch# show snmp view
View Name            Subtree OID              OID Mask          View Type
---------------------------     --------------------------------------
all                                      .1
all                               included

Total Entries: 1
```

show snmp group

Syntax

show snmp group

Parameter

Default

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 community

Syntax

show snmp community

Parameter

Default

Mode

Privileged EXEC

Usage

To show the configuration of snmp communities, use the command **show snmp community** in the Privileged EXEC mode.

Example

The following example shows the SNMP communities configuration.

```
Switch# show snmp community
Commnunity Name                                              Group Name        View Access
-------------------- ------------------------------ ----------
-------------------- ------------
private                                                      all
ro
public                                                       all
rw

Total Entries: 2
```

show snmp user

Syntax

show snmp user

Parameter

Default

Mode

Privileged EXEC

Usage

To show the SNMP users defined on the switch, use the command **show snmp user** in the Privileged EXEC mode.

Example

The following example shows the configuration of SNMP user.

```
Switch# show snmp user
Username:               v3
Password:               ********
Privilege Mode:         rw
Access GroupName:       v3
Authentication Protocol: md5
Encryption Protocol:    none
Access SecLevel:        auth

Total Entries: 1
```

show snmp engineid

Syntax

show snmp engineid

Parameter

Default

Mode

Privileged EXEC

Usage

To show the SNMPv3 engine IDs defined on the switch, use the command **show snmp engineid** in the Privileged EXEC mode.

Example

The following example shows the SNMP engind id information.

```
Switch# show snmp engineid
Local SNMPV3 Engine id: 00036d001122

IP address                        Remote SNMP engineID
-------------------------------- ----------------------------
------------------------------------
192.168.1.11                      00036D10000A

     Total Entries: 1
```

show snmp trap

Syntax

show snmp trap

Parameter

Default

Mode

Privileged EXEC

Usage

To show the status of SNMP traps on the switch, use the command **show snmp trap** in the Privileged EXEC mode.

Example

The following example shows the status of SNMP traps.

```
Switch# show snmp trap
SNMP auth failed trap : Enable
SNMP linkUpDown trap : Enable
SNMP cold-start trap      : Enable
SNMP warm-start trap            : Enable
```

show snmp host

Syntax

show snmp host

Parameter

Default

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
```

32. RMON

rmon event

Syntax

rmon event <1-65535> [log] [trap COMMUNITY] [descriptionDESCRIPTION] [owner NAME]
no rmon event <1-65535>

Parameter

<1-65535>	Specify event index to create or modify.
[log]	(Optional)Specify to show syslog.
[trap COMMUNITY]	(Optional)Specify SNMP community to show SNMP trap.
[descriptionDESCRIPTION]	(Optional)Specify description of event
[owner NAME]	(Optional)Specify owner of event.

Default

No default is defined.

Mode

Global Configuration

Usage

Use the **rmon event** command to add or modify a RMON evnet entry.
Use the **no** form of this command to delete.
You can verify settings by the **show rmon event** command.

Example

The example shows how to add RMON event entry with log and trap action and then modify it action to log only.

```
switch(config)# rmon event 1 log trap public description test owner admin
switch(config)# show rmon event 1

Rmon Event Index                  1
Rmon Event Type                 : Log and
Trap Rmon Event Community : public Rmon
Event Description : test
Rmon Event Last Sent :
Rmon Event Owner                  : admin

switch(config)# rmon event 1 log description test owner admin
switch(config)# show rmon event 1
Rmon Event Index                  1
Rmon Event Type                 : Log
Rmon Event Community : public Rmon
Event Description : test
Rmon Event Last Sent  :
Rmon Event Owner                  : admin
```

rmon alarm

Syntax

```
rmon alarm <1-65535> interface IF_PORT (drop-events|octets|pkts|broadcast-pkts|
multicast-pkts|crc-align-errors|undersize-pkts|oversize-pkts|fragments|jabbers|collisions
|pkts64octets|pkts65to127octets|pkts128to255octets|pkts256to511octets|pkts512to1023octets
|pkts1024to1518octets) <1-2147483647> (absolute|delta) rising <0-2147483647> <0-
65535> falling <0-2147483647> <0-65535> startup (rising|rising-falling|falling) [owner
NAME]
```

```
no rmon alarm <1-65535>
```

Parameter

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

Default

No default is defined.

Mode

Global Configuration

Usage

Use the **rmon alarm** command to add or modify a RMON alarm entry.Before add alarm entry, at least one event entry must be added. Use the **no** form of this command to delete.
You can verify settings by the **show rmon alarm** command.

Example

The example shows how to add RMON alarm entry that sample interface fa1 packets delta count every 300 seconds. Trigger event index 1 if over than rising threshold 10000, trigger event index 2 if lower than falling threshold.

```
switch(config)# rmon event 1 log
switch(config)# rmon event 2 log

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

Rmon Alarm Index1
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
```

rmon history

Syntax

```
rmon history <1-65535> interface IF_PORT [buckets <1-65535>] [interval <1-3600>] [owner
NAME]
no rmon history <1-65535>
```

Parameter

<1-65535>	Specify history index to create or modify.
IF_PORT	Specify the interface to sample
[bucket <1-65535>]	(Optional) Specify the maximum number of buckets.

[interval <>1-3600]	(Optional) Specify time interval for each sample
[owner NAME]	(Optional)Specify owner of history

Default

No default is defined.

Mode

Global Configuration

Usage

Use the **rmon history** command to add or modify a RMON history entry.
Use the **no** form of this command to delete.
You can verify settings by the **show rmon history** command.

Example

The example shows how to add RMON history entry that monitor interface gi1 every 60 seconds and then modify it to monitor every 30 seconds.

```
switch(config)# rmon history 1 interface gi1 interval 60 owner admin
switch(config)# show rmon history 1
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
```

clear rmon interfaces statistics

Syntax

clear rmon interfaces IF_PORTS statistics

Parameter

IF_PORTS	specifies ports to clear

Default

No default is defined

Mode

Privileged EXEC

Usage

Use the **clear rmon interfaces statistics** command to clear RMON etherStat statistics those are recorded on interface.
You can verify results by the **show rmon interface statistics** command.

Example

The example shows how to clear RMON etherStat statistics on interface gi1.

```
switch# clear rmon interfaces gi1 statistics
switch# show rmon interfaces gi1 statistics
==== Port gi1 ==============================
etherStatsDropEvents       0
etherStatsOctets  0
etherStatsPkts     0
etherStatsBroadcastPkts  0
etherStatsMulticastPkts    0
etherStatsCRCAlignErrors 0
etherStatsUnderSizePkts  0
etherStatsOverSizePkts    0
etherStatsFragments        0
etherStatsJabbers 0
etherStatsCollisions         0
```

```
etherStatsPkts64Octets     0
etherStatsPkts65to127Octets      0
etherStatsPkts128to255Octets     0
etherStatsPkts256to511Octets     0
etherStatsPkts512to1023Octets  0
etherStatsPkts1024to1518Octets0
```

show rmon interfaces statistics

Syntax

show rmon interfaces IF_PORTS statistics

Parameter

IF_PORTS	specifies ports to show

Default

No default is defined

Mode

Privileged EXEC

Usage

Use the **show rmon interfaces statistics** command to show RMON etherStat statistics of interface.

Example

The example shows how to show RMON etherStat statistics of interface gi1.

```
switch(config)# show rmon interfaces gi1 statistics
==== Port gi1 ===============================
etherStatsDropEvents                              0
etherStatsOctets                               : 81882
etherStatsPkts                                 578
etherStatsBroadcastPkts                      10
```

```
etherStatsMulticastPkts                 0
etherStatsCRCAlignErrors                  0
etherStatsUnderSizePkts                  0
etherStatsOverSizePkts                  0
etherStatsFragments                    0
etherStatsJabbers                    0
etherStatsCollisions                   0
etherStatsPkts64Octets                 355
etherStatsPkts65to127Octets              126
etherStatsPkts128to255Octets              0
etherStatsPkts256to511Octets              42
etherStatsPkts512to1023Octets              55
etherStatsPkts1024to1518Octets              0
```

show rmon event

Syntax

show rmon event (<1-65535> | all)

Parameter

<1-65535>	specifies event index to show
all	Show all existed event

Default

No default is defined

Mode

Privileged EXEC

Usage

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

Example

The example shows how to show rmon event entry.

```
switch(config)# rmon event 1 log trap public description test owner admin
switch(config)# show rmon event 1
Rmon Event Index 1
Rmon Event Type  : Log and Trap
Rmon Event Community : public
Rmon Event Description : test
Rmon Event Last Sent :
Rmon Event Owner         : admin
```

show rmon event log

Syntax

show rmon event <1-65535> log

Parameter

<1-65535>	specifies event index to show event log

Default

No entry and log is exist

Mode

Privileged EXEC

Usage

Use the **show rmon event log** command to show log triggered by RMON alarm.

Example

The example shows how to show rmon event log.

```
switch(config)# show rmon event 1 log
===============================================================
Index          1
Alarm Index         1
Action         : Startup Falling
Time           : (32918334) 3 days, 19:26:23.34
Description : fa1.Pkts=0 <= 100
```

show rmon alarm

Syntax

show rmon alarm (<1-65535> | all)

Parameter

<1-65535>	specifies alarm index to show
all	Show all existed alarm

Default

No alarm is defined

Mode

Privileged EXEC

Usage

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

Example

The example shows how to show rmon alarm entry.

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

```
Rmon Alarm Index1
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

<1-65535>	specifies history index to show
all	Show all existed history

Default

No history is defined

Mode

Privileged EXEC

Usage

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

Example

The example shows how to show RMON history entry.

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

show rmon history statistic

Syntax

show rmon history <1-65535> statistic

Parameter

<1-65535>	specifies history index to show history statistic

Default

No history is defined

Mode

Privileged EXEC

Usage

Use the **show rmon history statistic** command to show statistics that are recorded by RMON history.

Example

The example shows how to show RMON history statistics

```
switch(config)# show rmon history 1 statistics
=====================================================
Sample Index       2
Interval Start     : (32940466) 3 days, 19:30:04.66
DropEvents0
Octets: 117226
Pkts    763
```

```
BroadcastPkts      9
MulticastPkts      0
CRCAlignErrors     0
UnderSizePkts      0
OverSizePkts       0
Fragments  0
Jabbers 0
Collisions    0
Utilization1

==========================================================
Sample Index       1
Interval Start     : (32939462) 3 days, 19:29:54.62
DropEvents0
Octets  220
Pkts     3
BroadcastPkts      1
MulticastPkts      0
CRCAlignErrors     0
UnderSizePkts      0
OverSizePkts       0
Fragments  0
Jabbers      0
Collisions      0
Utilization    0
```

33. Spanning Tree

instance (MST)

Syntax

instance *instance-id* **vlan** *vlan-list*
no instance *instance-id* **vlan** *vlan-list*

Parameter

instance-id	The MSTP instance ID from 0 to 15.

vlan *vlan-list*	Add the VLAN list to the MSTP instance.

Default

All VLANs are mapped to the Common and Internal Spanning Tree (CIST)instance (instance 0).

Mode

MST Configuration

Usage

To map the VLAN to the Multiple Spanning Tree (MSTP) instances, use the command instance in the MST Configuration mode; and use the no form of the command to restore its default configuration.
All VLANs that are not explicility configured to an MSTP instance are mapped to the CIST instance (instance 0).

For two or more switches in the samp MSTP regiom, their VLAN mapping, name and revision number configuration, must be the same.

Example

The following example maps the vlan 10-20 to the MSTP instance 1, and VLAN 100 to instance 2.

```
Switch(config)# spanning-tree mst configuration
Switch(config-mst)# instance 1 vlan 10-20
Switch(config-mst)# instance 2 vlan 100
```

name (MST)

Syntax

name *name-str*
no name

Parameter

name-str	The MSTP instance name. Its maximum length is 32 characters.

Default

The default MSTP name is the switch MAC address.

Mode

MST Configuration

Usage

To define the name for MSTP instance, use the command **name** in the MST Configuration mode; and use the **no** form to restore the default name configuration.

Example

The following example configures the name of MST instance to *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 rage is from 0 to 65535.

Default

The default revision number is 0.

Mode

MST Configuration

Usage

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

Example

The following example defines the revision MSTP configuration to 1.

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

spanning-tree mst configuration

Syntax

spanning-tree mst configuration

Parameter

Default

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

instance-id	Specify the instance ID. The valid range is from 0 to 15.
cost	Specify the path cost for the interfaces on the specific MSTP instance. For the long path cost method, its valid range is from 0 to 200000000; and the valid range is from 0 to 65535 for the short path cost method. The value 0 indicates AUTO, which the port path cost is determined by the port speed and the path cost method.

Default

The default port path cost is 0, and it is determined by the port speed and the path cost method (long or short).

Interface	**Long**	**Short**
Gigabit Ethernet(1000Mbps)	20000	4
Fast Ethernet (100Mbps)	200000	19
Ethernet (10Mbps)	2000000	100

Mode

Interface Configuration

Usage

To configure the path cost for MSTP calculations, use the command **spanning-tree mst cost** in the Interface Configuration mode. If the loop occurs, the MSTP considers the path cost when selecting the interface into the Forwarding state. For the default configuration, use the no form of the command.

When configuring the path cost on the CIST (instance 0), it is equal to the command **spanning-**

tree cost in the Interface Configuration mode.

Example

The following example configures the path cost of interface fa1 on the instance 1 to 30000

```
Switch(config)# interface gi1
Switch(config-if)# spanning-tree mst 1 cost 30000
```

spanning-tree mst port-priority

Syntax

spanning-tree mst *instance-id* **port-priority** *priority*
no spanning-tree mst *instance-id* **port-priority**

Parameter

instance-id	Specify the instance ID. The valid range is from 0 to 15.
priority	Specify the interface priority on the specific instance.

Default

The default port priority on each instance is 128

Mode

Interface Configuration

Usage

To configure the interface priority on the specific instances, use the command **spanning-tree mst port-priority** in the Interface Configuration mode. For the default configuration, use the **no** form of the command.

The priority value must be the multiple of 16. When the port priority on the CIST (instance 0) is configured, it is equal to the command **spanning-tree port-priority** in the Interface Configuration mode.

Example

The following example sets the port priority of gi1 on the instance 1 to 144; and set the port priority of gi1 on the CIST (instance 0) to 96

```
Switch(config)# interface gi1
Switch(config-if)# spanning-tree mst 1 port-priority 144
Switch(config-if)# spanning-tree mst 0 port-priority 96
```

spanning-tree mst priority

Syntax

spanning-tree mst instance *instance-id* **priority** *priority*
no spanning-tree mst instance *instance-id* **priority**

Parameter

instance-id	Specify the instance ID. The valid range is from 0 to15.
priority	Specify the bridge priority on the specific instance. The valid range is from 0 to 61440. It nsures the probility that the switch is selected as the root bridge, and the lower values has the higher priority for the switch to be selected as the root bridge.

Default

The default priority on each instance is 32768.

Mode

Global Configuration

Usage

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

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

Example

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

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

spanning-tree

Syntax

spanning-tree
no spanning-tree

Parameter

Default

Spanning-Tree is enabled by default.

Mode

Global Configuration

Usage

To enable the spanning tree, use the command **spanning-tree** in the Global Configuration mode; and use the no form of the command to disable the spanning tree on the switch.

Example

The following example disables and enables the spanning tree individually.

```
Switch(config)# no spanning-tree
Switch(config)# spanning-tree
```

spanning-tree mode

Syntax

```
spanning-tree mode (mstp|rstp|stp)
no spanning-tree force-version
```

Parameter

mstp	Enable the Multiple Spanning Tree (MSTP) operation.
rstp	Enable the Rapid Spanning Tree (RSTP) operation.
stp	Enable the Spanning Tree (STP) operation.

Default

The default mode is rstp.

Mode

Global Configuration

Usage

To specify the spanning tree operation mode, use the command of **spanning- tree mode** in the Global Configuration mode. For the default configuration, use the command **no spanning-tree force-version** in the Global Configuration mode.

When the switch is configured as MSTP mode, it can use STP and RSTP for the backward compatibility with switches working in STP and RSTP mode individually. For the RSTP configuration, the switch can also use STP for the switches working in the STP operation.

Example

The following example sets the STP operation to MSTP.

```
Switch(config)# spanning-tree mode mstp
```

spanning-tree bpdu

Syntax

spanning-tree bpdu (filtering|flooding)
no spanning-tree bpdu

Parameter

filtering	Filter the BPDU when STP is diabled.
flooding	Flood the BPDU when the STP is disabled.

Default

The default configuration is flooding.

Mode

Global Configuration

Usage

To configure the action of Bridge Protocol Data Unit (BPDU) handlring when STP is disabled, use the command **spanning-tree bpdu** in the Global Configuration mode. To restore the configuration to the default action, use the no form of the command.

Example

The following example configures the action of BPDU handling to fliter when the STP is disabled.

```
Switch(config)# spanning-tree bpdu filtering
```

spanning-tree bpdu-filter

Syntax

spanning-tree bpdu-filter

no spanning-tree bpdu-filter

Parameter

Default

BPDU filter is disabled.

Mode

Interface Configuration

Usage

To enable the BPDU filter, use the command **spanning-tree bpdu-filter** in the Interface Configuration mode; and use **no** form of the command to disable the BPDU filter.

Example

The following example enables the BPDU filter for interface gi1.

```
Switch(config)# interface gi1
Switch(config-if)# spanning-tree bpdu-filter
```

spanning-tree bpdu-guard

Syntax

spanning-tree bpdu-guard
no spanning-tree bpdu-guard

Parameter

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

Mode

Interface Configuration

Usage

To configure the STP path cost for an interface, use the command **spanning-tree cost** in the Interface Configuration mode; and use the **no** form of the command to restore it to the default configuration.

Example

The following example configures port path cost to 30000 for interface fa2.

```
Switch(config)# interface gi1
Switch(config-if)# spanning-tree cost 30000
```

spanning-tree forward-delay

Syntax

spanning-tree forward-delay *seconds*
no spanning-tree forward-delay

Parameter

seconds	STP forward delay time. Its valid range is from 4 to 30 seconds.

Default

The default forward delay time is 15 seconds.

Mode

Global Configuration

Usage

To configure the STP bridge forward delay time, which is the amount of time that a port remains in the Listening and Learning states before it enters the Forwarding state, use the command spanning-tree forward-time in the Global Configuration mode. To restore it to the default configuration, use the **no** form of the command.

When the forward delay time is configured, the following relationship shold be maintained:

2 * (forward-time - 1) >= Max-Age

Example

The following example configures STP forward delay time to 25.

```
Switch(config)# spanning-tree forward-time 25
```

spanning-tree hello-time

Syntax

spanning-tree hello-time seconds
no spanning-tree hello-time

Parameter

seconds	STP hello time in second. Its valid range is from 1 to 10 seconds.

Default

The default STP hello time is 2 seconds.

Mode

Global Configuration

Usage

STP hello time is the time interval to broadcast its hello message to other bridges. To configure the STP hello time, use the command **spanning-tree hello-time** in the Global Configuration mode; and use the **no** form of the command to restore the hello time to default configuration.

When the hello time is configured, the following relationship should be maintained:
Max-Age >= 2 * (hello-time + 1)

Example

The following example configures BPDU hello time to 4.

```
Switch(config)# spanning-tree hello-time 4
```

spanning-tree maximum-age

Syntax

spanning-tree maximum-age *seconds*
no spanning-tree maximum-age

Parameter

seconds	The interval in seconds for a switch to wait the configuration messages, without attempting to redefine its own configuration.

Default

The default maximum age is 20 seconds.

Mode

Global Configuration

Usage

To set the interval in seconds that the switch can wait without receiving the configuration messages, before attempting to redefine its own configuration, use the command **spanning-tree maximum-age** in the Global Configuratio mode. For the default configuration, use the **no** form of the commands.

When the maximum age is configured, the following relationship should be maintained:
2 * (forward-time - 1)>= Max-Age >= 2 * (hello-time + 1)

Example

The following example configures STP maximum age to 10.

```
Switch(config)# spanning-tree maximum-age 10
```

spanning-tree edge

Syntax

spanning-tree edge
no spanning-tree edge

Parameter

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 gi1.

```
Switch(config)# interface gi1
Switch(config-if)# spanning-tree edge
```

spanning-tree link-type

Syntax

spanning-tree link-type (point-to-point|shared)
no spanning-tree link-type

Parameter

point-to-point	Specify the port link type is point to point.
shared	Specify the port link type is shared.

Default

The default configuration link type is **point-to-poin**t for the ports with full duplex configuration, and **shared** for the ports with half duplex settings.

Mode

Interface Configuration

Usage

To set the RSTP link-type for an interface, use the command **spanning-tree link** in the Interface Configuration mode. For the default configuration, use the **no** form of the command.

Example

The following example configures the link-type to point-to-point for the interface gi1.

```
Switch(config)# interface gi1
Switch(config-if)# spanning-tree link-type point-to-point
```

spanning-tree max-hops

Syntax

spanning-tree max-hops counts
no spanning-tree max-hops

Parameter

counts	Specify the number of hops in an MSTP regision before the BPDU is discarded. The valid range is 1 to 40.

Default

The default max-hops configuration is 20.

Mode

Global Configuration

Usage

To specify the number of hops for a BPDU to be forwarded in the MSTP region, use the command **spanning-tree max-hops** in the Global Configuration mode; and restore the setting to default configuration by the **no** form of the command.

Example

The following example specifies the max hops for BPDU to 10.

```
Switch(config)# spanning-tree max-hops 10
```

spanning-tree mcheck

Syntax

spanning-tree mechek

Parameter

Default

Mode

Interface Configuration

Usage

To restart the Spanning Tree Protocol (STP) migration process (re-negotiate forcely with its neighborhood) on the specific interface, use the command spanning-tree mcheck in the Interface Configuration mode

Example

The following example restarts the STP negotiation on the interface gi1.

```
Switch(config)# interface gi1
Switch(config-if)# spanning-tree mecheck
```

spanning-tree pathcost method

Syntax

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

Parameter

long	The range for the path cost is from 1 to 200000000.
short	The range for the path cost is from 1 to 65535.

Default

The default path cost method is long.

Mode

Global Configuration

Usage

To set the spanning tree path cost method, use the command **spanning-tree pathcost method** in the Global Configuration mode.
If the short method is specified, the switch calculates the path cost in the range 1 throuth 65535; Otherwise, it calculates the path cost in the range 1 to 200000000.

Example

The following example modifies path cost method to short.

```
Switch(config)# spanning-tree pathcost method short
```

spanning-tree port-priority

Syntax

spanning-tree port-priority *priority*
no spanning-tree port-priority *priority*

Parameter

priority	Specify the priority for an interface. The valid range is from 0 to 240.

Default

The default priority for each interface is 128.

Mode

Interface Configuration

Usage

To configure the STP priority for an interface, use the command **spanning- tree port-priority** in the Interface Configuration mode. For the default configuration, use the **no** form of the command.

The priority value must be the multiple of 16.

Example

The following example modifies the port priority to 96 for the interface gi2 .

```
Switch(config)# interface gi2
Switch(config-if)# spanning-tree port-priority 96
```

spanning-tree priority

Syntax

spanning-tree priority *priority*
no spanning-tree priority

Parameter

instance-id	Specify the instance ID. The valid range is from 0 to 15.
priority	Specify the bridge STP priority. The valid range is from 0 to 61440. It nsures the probility that the switch is selected as the root bridge, and the lower values has the higher priority for the switch to be selected as the root bridge of the STP topology.

Default

The default priority for the switch 32768.

Mode

Global Configuration

Usage

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

The value of bridge priority must be the multiple of 4096. A switch with the lowest priority is the root of the STP topology. When swithes with the same priority configuration in the environment, the switch with lowest MAC address would be selected as the root bridge.

Example

The following example modifies the bridge priority to 4096.

```
Switch(config)# spanning-tree priority 4096
```

spanning-tree tx-hold-count

Syntax

spanning-tree tx-hold-count *count*
no spanning-tree tx-hold-count

Parameter

count	Specify the tx-hold-count used to limit the maximum numbers of packets transmission per second. The valid range is from 1 to 10.

Default

The default value is 6.

Mode

Global Configuration

Usage

To limit the maximum numbers of packets transmission per second, use the command **spanning-tree tx-hold-count** in the Global Configuration mode. For the default configuration, use the **no** form of the command.

Example

The following example sets the tx-hold-count to 4.

```
Switch(config)# spanning-tree tx-hold-count 4
```

show spanning-tree

Syntax

show spanning-tree

Parameter

Default

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:   long

  Root ID      Priority      32768
               Address        1c:2a:a3:c4:02:92
               This switch is the root
               Hello Time    2 sec    Max Age 20 sec    Forward Delay 15 sec

  Number of topology changes 3 last change occurred 00:00:03 ago
  Times:    hold 0, topology change 0, notification 0
            hello 2, max age 20, forward delay 15

Interfaces
  Name        State     Prio.Nbr     Cost       Sts     Role EdgePort          Type
--------- -------- -------- -------- ------ ---- -------- -----------------
      gi1   enabled     128.1        20000     Frw     Desg            No P2P (RSTP)
     gi15   enabled     128.15      200000     Frw     Desg            No P2P (RSTP)
     gi25   enabled     128.25      200000     Frw     Desg            No P2P (RSTP)
```

show spanning-tree interface

Syntax

show spanning-tree interface *IF_PORTS* [**statistic**]

Parameter

interface *IF_PORTS*	An interface ID or the list of interface IDs.
statistic	Display the STP statistic for an interface.

Default

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 gi1.

```
Switch# show spanning-tree interfaces gi1

Port gi1 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 gi1.

```
Switch# show spanning-tree interfaces gi1 statistic

STP Port Statistic
```

```
==================================================

Port                             : gi1
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 *instace-id*

Parameter

instance-id	The MSTP instance ID. Its valid range is from 0 to 15.

Default

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/ 0/1C:2A:A3:C4:02:92
-------------------------------------------------------
```

```
  Designated Root Bridge : 32768/ 0/1C:2A:A3:C4:02:92
External Root Path Cost : 0
    Regional Root Bridge : 32768/ 0/1C:2A:A3:C4:02:92
Internal Root Path Cost : 0
        Designated Bridge : 32768/ 0/1C:2A:A3:C4:02:92
                Root Port : 0/0
                  Max Age : 20
            Forward Delay : 15
         Topology changes : 3
     Last Topology Change : 374
------------------------------------------------------------
 VLANs mapped: 1-4094
================================================================

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- -------------------------------
gi1               Desg FWD 20000      128.1    P2P (RSTP)
gi15              Desg FWD 200000     128.15   P2P (RSTP)
gi25              Desg FWD 200000     128.25   P2P (RSTP)
```

show spanning-tree mst interface

Syntax

show spanning-tree mst *instance-id* **interface** *IF_PORTS*

Parameter

instance-id	The MSTP instance ID. Its valid range is from 0 to 15.
interface *IF_PORTS*	An interface ID or the list of interface IDs.

Default

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 gi1.

```
Switch# show spanning-tree mst 0 interfaces g1

 MST Port Information
==============================================================
 Instance Type : CIST (0)
-----------------------------------------------------------

      Port Identifier : 128/1
   External Path-Cost : 0          /20000
   Internal Path-Cost : 0          /20000
-----------------------------------------------------------
  Designated Root Bridge : 32768/1C:2A:A3:C4:02:92
      External Root Cost : 0
    Regional Root Bridge : 32768/1C:2A:A3:C4:02:92
      Internal Root Cost : 0
       Designated Bridge : 32768/1C:2A:A3:C4:02:92
 Internal Port Path Cost : 20000
               Port Role : Designated
              Port State : Forwarding
-----------------------------------------------------------
```

show spanning-tree mst configuration

Syntax

show spanning-tree mst configuration

Parameter

Default

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
-------------------------------------------------------------------------------
```

34. Static Routing

interface vlan (IPv4)

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     Status
------------------- ---------- ---------- ------- ------
192.168.3.1/24      VLAN 2     UP/DOWN                   Static   Valid
```

ip route

Syntax

ip route *dest-ipaddr mask router-ipaddr*
no ip route *dest-ipaddr mask router-ipaddr*

Parameter

dest-ipaddr	Destination ip address prefix
mask	Destination ip address prefix mask
router-ipaddr	Forwarding router's ip address

Default

Static route is not configured by default.

Mode

Global Configuration mode.

Usage

Use the **ip route** command in global mode to configure a static route rule.
Use the **no ip route** command to delete a static routing rule.
You can verify your setting by entering the **show ip route** Privileged EXEC command

Example

The following example shows how to configure a static route.

```
Switch(config)# vlan 2
Switch(config)# interface GigabitEthernet 4
Switch(config-if)# switchport trunk allowed vlan add 2
Switch(config)# interface vlan 2
Switch(config-if)# ip address 192.168.3.1 255.255.255.0
Switch(config)# ip route 1.1.1.1 255.0.0.0 192.168.3.11
Switch# show ip route
Codes: > - best, C - connected, S - static

S>   1.0.0.0/8 [1/1] via 192.168.3.11, VLAN 2
C>   192.168.0.0/24 is directly connected, MGMT VLAN
C>   192.168.3.0/24 is directly connected, VLAN 2
```

arp

Syntax

arp *ip-addr mac-addr* **vlan** *vlanid*
no arp *ip-addr mac-addr* **vlan** *vlanid*

Parameter

ip-addr	IP address of ARP entry
mac-addr	MAC address of ARP entry
vlanid	Vlan ID of this arp entry

Defaul

The device contains ARP entries of the vlan interface.

Mode

Global Configuration mode

Usage

Use the **arp** command to add a static arp entry.
Use the **no arp** command to delete a static arp entry.
You can verify your setting by entering the **show arp** Privileged EXEC command

Example

The following example shows how to configure and view a static arp entry.

```
Switch(config)# arp 192.168.3.22 00:00:11:11:11:11 vlan 2
Switch# show arp
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
```

interface vlan (IPv6)

Syntax

interface vlan *vlanid*
ipv6 enable
no interface vlan *vlanid*
no ipv6 enable

Parameter

vlanid	Vlan id for vlan interface

Default

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

Mode

Global configuration and vlan interface configuration.

Usage

Use the **interface vlan** global configuration command to config ip interface on the device.
Use the **ipv6 enable** command in vlan interface mode to enable ipv6 function.
Use the **no ipv6 enable** command to disable ipv6 function.
Use the **no interface vlan** command to delete ip interface on the device.
You can verify your setting by entering the **show ipv6 interface vlan** Privileged EXEC command.

Example

The following example shows how to config ip interface.

```
Switch(config)# interface vlan 2
Switch(config-if)# ipv6 enable
Switch# show ipv6 interface vlan 2

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 route

Syntax

ipv6 route *ipv6-addr/length route-ipv6-addr*
no ipv6 address *ipv6-addr/length*

Parameter

ipv6-addr/length	Destination ipv6 prefix and length
route-ipv6-addr	Forwarding router's ipv6 address

Default

The ipv6 routing entry is not configured by default.

Mode

Global configuration and vlan interface configuration.

Usage

Use the **ipv6 route** command to configure a static ipv6 routing entry.
Use the **no ipv6 address** command to delete a static ipv6 routing entry.
You can verify your setting by entering the **show ipv6 route static** Privileged EXEC command.

Example

The following example shows how to configure an ipv6 routing entry.

```
Switch(config)# ipv6 route 2002:01::01:01/96 2001:01::01:02
Switch# show ipv6 route static
Codes: A - active, I - inactive

I     2002:1::/96 [1/1] via 2001:1::1:2, inactive
```

ipv6 neighbors

Syntax

ipv6 neighbor *ipv6-addr* **vlan** *vlanid macaddr*
no ipv6 neighbor

Parameter

ipv6-addr	Neighbor ipv6 address
vlanid	Vlan interface number

macaddr	MAC address of ipv6 neighbor entry

Default

No ipv6 neighbor address by default.

Mode

Global configuration.

Usage

Use the **ipv6 neighbor** command to configure a static ipv6 neighbor entry.
Use the **no ipv6 neighbor** command to delete ipv6 neighbor entry.
You can verify your setting by entering the **show ipv6 neighbors** Privileged EXEC command.

Example

The following example shows how to configure an ipv6 neighbor entry.

```
Switch(config)# ipv6 neighbor 2001:01::01:11 vlan 2 00:00:00:11:11:12
Switch# show ipv6 neighbors
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
```

show ip interface vlan

Syntax

show ip interface vlan *vlanid*

Parameter

vlanid	Vlan id for vlan interface

Default

Mode

Privileged EXEC

Usage

Use the command "show IP interface VLAN" to query the interface information.

Example

The following example shows how to show VLAN interface information.

```
Switch# show ip interface vlan 2

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

show ipv6 interface vlan

Syntax

show ipv6 interface vlan *vlanid*

Parameter

vlanid	Vlan id for vlan interface

Default

Mode

Privileged EXEC

Usage

Use the command "show IPv6 interface VLAN" to query the IPv6 information of the interface

Example

The following example shows how to show VLAN interface ipv6 information.

```
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
```

show ip route

Syntax

show ip route

Parameter

Default

Mode

Privileged EXEC

Usage

Use the command "show ip route" to query the system IP route table entries.

Example

The following example shows how to show routing information

```
Switch# show ip route
Codes: > - best, C - connected, S - static

S>    1.0.0.0/8 [1/1] via 192.168.3.11, VLAN 2
C>    192.168.0.0/24 is directly connected, MGMT VLAN
C>    192.168.3.0/24 is directly connected, VLAN 2
```

show ipv6 route

Syntax

show ipv6 route

Parameter

Default

Mode

Privileged EXEC

Usage

Use the command "show IPv6 route" to query the system static IPv6 route table entries.

Example

The following example shows how to show ipv6 static routing

```
Switch# show ipv6 route static
Codes: A - active, I - inactive

I    2002:1::/96 [1/1] via 2001:1::1:2, inactive
```

show arp

Syntax

show arp

Parameter

Default

Mode

Privileged EXEC

Usage

Use the command "show ARP" to query static ARP table entries.

Example

The following example shows how to show ARP table entry

```
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
```

show ipv6 neighbors

Syntax

show ipv6 neighbor

Parameter

Default

Mode

Privileged EXEC

Usage

Use the command "show IPv6 neighbor" to query the system's IPv6 neighbor table entries.

Example

The following example shows how to show ipv6 neighbor entry.

```
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
```

35. Storm Control

storm-control

Syntax

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

Parameter

broadcast	Select broadcast storm control type
unknown-unicast	Select unknown unicast storm control type
unknown-multicast	Select unknown multicast storm control type

Default

Default storm control is disabled.
Default broadcast storm control is disabled.
Default unknown multicast storm control is disabled
Default unknown unicast storm control is disabled

Mode

Interface Configuration

Usage

Storm control function is able to enable/disable on each single port. Use the "**storm control**" command to enable storm control feature on the selected ports. And use "**no storm control**" command to disable storm control feature. Not only port is able to enable/disable on the port. Each storm control type is also able to enable/disable on each single port.
Use the " **storm-control** (**broadcast**|**unknown-unicast**|**unknown-multicast**) " command to enable the storm control type you need and use no form to disable it.

Example

This example shows how to enable storm control on interface gi1.

```
Switch(config)# interface gi1
Switch(config-if)# storm-control
```

This example shows how to enable broadcast storm control and configure broadcast storm control rate to 200.

```
Switch(config)# interface gi1
Switch(config-if)# storm-control broadcast
```

This example shows how to show current storm control configuration on interface gi1

```
Switch# show storm-control interfaces gi1

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.

Mode

Interface Configuration

Usage

Use “**storm-control action”** command to set the action when the received storm control packets exceed the maximum rate on an interface.
Use **no** form to restore to default action.

Example

This example shows how to configure storm control action to shutdown port on interface gi1.

```
Switch(config)# interface gi1
Switch(config-if)# storm-control action shutdown
```

This example shows how to show storm control action on interface gi1.

```
Switch# show storm-control interfaces gi1

Port   | State | Broadcast | Unkown-Multicast | Unknown-Unicast | Action
|       |           pps       |           pps       |           pps
|
---------+-------+------------+--------------------+-----------------|--------
---
gi1       disable    Off( 10000)       Off( 10000)        Off( 10000)       Shutdown
```

storm-control ifg

Syntax

storm-control ifg (**include** | **exclude**)

Parameter

include	Include preamble & IFG (20 bytes) when count ingress storm control rate.
exclude	Exclude preamble & IFG (20 bytes) when count ingress storm control rate

Default

Default storm control inter frame gap is excluded.

Mode

Global Configuration

Usage

Storm control mechanism will try to calculate ingress packets is exceed configured rate or not and do corresponding action.
Use **storm-control ifg** command to include/exclude the preamble and inter frame gap into the calculating.

Example

This example shows how to configure storm inter frame gap to include.

```
Switch(config)# storm-control ifg include
```

This example shows how to show storm control global configuration.

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

storm-control level

Syntax

storm-control (**broadcast** | **unknown-unicast** | **unknown-multicast**) **level** *<1-1000000>*
no storm-control (**broadcast** | **unknown-unicast** | **unknown-multicast**) **level**

Parameter

broadcast	Select broadcast storm control type
unknown-unicast	Select unknown unicast storm control type
unknown- multicast	Select unknown multicast storm control type

level *<1-1000000>*	Specify the storm control rate for selected type. For bps, range is 16-1000000 For pps, range is 1-262143

Default

Default broadcast storm control rate is 10000.
Default unknown multicast storm control rate is 10000.
Default unknown unicast storm control rate is 10000.

Mode

Interface Configuration

Usage

Each control type is allowed to have different storm control rate.
Use “**storm-control (broadcast|unknown-unicast|unknown-multicast) level**” command to configure it
Use no form to restore to default rate.

Example

This example shows how to enable broadcast storm control and configure broadcast storm control rate to 200.

```
Switch(config)# interface gi1
Switch(config-if)# storm-control broadcast
Switch(config-if)# storm-control broadcast level 200
```

This example shows how to show current storm control configuration on interface gi1

```
Switch# show storm-control interfaces gi1
Port  | State | Broadcast | Unkown-Multicast | Unknown-Unicast | Action
|      |          pps       |          pps       |          pps
|
---------+-------+------------+-------------------+-----------------|--------
---
gi1             enable 200           Off( 10000)        Off( 10000)          Shutdown
```

storm-control unit

Syntax

storm-control unit (**bps** | **pps**)

Parameter

bps	Storm control rate calculates by octet-based
pps	Storm control rate calculates by packet-based

Default

Default storm control unit is bps.

Mode

Global Configuration

Usage

Storm control mechanism will try to calculate ingress packets is exceed configured rate or not and do corresponding action.
Use **storm-control unit** command to change the unit of calculating method.

Example

This example shows how to configure storm control rate unit as pps.

```
Switch(config)# storm-control unit pps
```

This example shows how to show storm control global configuration.

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

show storm-control

Syntax

show storm-control
show storm-control interface *IF_PORTS*

Parameter

IF_PORTS	Specify port to show.

Default

No default value for this command

Mode

Privileged EXEC

Usage

Use "**show storm-control**" command to show all storm control related configurations including global configuration and per port configurations.

Use "**show storm-control interface**" command to show selected port storm control configurations.

Example

This example shows how to show storm control global configuration.

```
Switch# show storm-control
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
|
---------+-------+------------+--------------------+-----------------|--------
---
gi1          enable          200                    Off( 10000)                  Off( 10000)    Shutdown
```

36. System File

copy

Syntax

```
copy (flash:// | tftp://) (flash:// | tftp://)
copy tftp:// (backup-config | running-config | startup-config)
cop usb (backup-config | running-config | startup-config)
copy (backup-config | running-config | startup-config) tftp://
copy (backup-config | running-config | startup-config) usb
copy (backup-config | startup-config) running-config
copy (backup-config | running-config) startup-config
copy (running-config | startup-config) backup-config
```

Parameter

flash://	Specify the file stored in flash to operation. Available files are: flash://startup-config flash://backup-config flash://rsa1 flash://rsa2 flash://dsa2 flash://image0 flash://image1 flash://ram.log flash://flash.log
tftp://	Specify remote tftp server and remote file name. The format is “**tftp://192.168.1.111/remote_file_name**”
usb	USB flash drive
running-config	Running configuration file
startup-config	Startup configuration file
backup-config	Backup configuration file

Default

No default value for this command.

Mode

Privileged EXEC

Usage

There are many types of files in system. These files are very important for administrator to manage the switch. The most common file operation is copy. By using these copy commands, we can upgrade, backup following type of files. When using USB flash disk, the file format of USB is FAT32.

- **Firmware Image**
- **Configuration Files**
- **Syslog Files**
- **Language Files**
- **Security Certificate**

Example

This example shows how to copy running configuration to startup configuration.

```
Switch# copy running-config startupst-config
```

This example shows how to backup running configuration to remote tftp server 192.168.111 with file name test1.cfg.

```
Switch# copy running-config tftp://192.168.1.111/test1.cfg
Uploading file...Please Wait...
Uploading Done
```

This example shows how to upgrade startup configuration from remote tftp server 192.168.1.111 with file name test2.cfg.

```
Switch# copy tftp://192.168.1.111/test2.cfg startup-config
Downloading file...Please Wait...
Downloading Done
Upgrade config success. Do you want to reboot now? (y/n)n
```

This example shows how to backup security file dsa2 to remote tftp server 192.168.1.111 with file name dsa2.

```
Switch# copy flash://dsa2 tftp://192.168.1.111/dsa2
Uploading file...Please Wait...
Uploading Done
```

delete

Syntax

delete (**startrup-config** | **backup-config** | **flash://**)

Parameter

flash://	Specify the configuration file stored in flash to delete. Available files are:

	flash://startup-config flash://backup-config
startup-config	Delete startup configuration file
backup-config	Delete backup configuration file

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 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 *IF_PORTS*	Specify port to restore its' ruuning config

Default

No default value for this command.

Mode

Privileged EXEC

Usage

Use "**restore-defaults**" command to restore factory default of all system. The command is equal to "**delete startup-config**"

Example

This example shows how to restore factory defaults.

```
Switch# restore-defaults
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
```

show config

Syntax

show (**running-config** | **startrup-config** | **backup-config**)
show running-config interfaces *IF_PORTS*

Parameter

running-config	Show running configuration on terminal
startup-config	Show startup configuration on terminal
backup-config	Show backup configuration on terminal
IF_PORTS	Specify port to show its’ ruuning config

Default

No default value for this command.

Mode

Privileged EXEC

Usage

Our configuration file is text based. Therefore, we can show the configuration on terminal and read it by this command.

Use “**show config**” command to show configuration files stored in system.

Use “**show config interfaces**” command to show specific port configurations.

Example

This example shows how to show startup configuration

```
Switch# show startup-config
! 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 configuraiton on specific port.

```
Switch# show running-config interfaces gi1
interface gi1
rate-limit ingress 128
```

show flash

Syntax

```
show flash
```

Parameter

Default

No default value for this command.

Mode

Privileged EXEC

Usage

Use “**show flash**” command to show all files’ status which stored in flash.

Example

This example shows how to show all files status stored in flash.

```
Switch# show flash
File Name                 File Size                 Modified
------------------------ ---------------- ------------------------
startup-config          1191              2000-01-01 00:00:23
backup-config           1607              2000-01-01 08:36:23
rsa1              974              2000-01-01 00:00:18
rsa2             1675              2000-01-01 00:00:18
dsa2              668              2000-01-01 00:00:18
ssl_cert                 993              2000-01-01 00:00:18
image0 (active)         4372401         2012-09-24 01:57:29
image1 (backup)         0
```

usb install

Syntax

usb install

Parameter

Default

Mode

Privileged EXEC

Usage

Use the command "USB install" to install the USB driver. Note that the file format of the USB flash disk should be FAT32. After the driver is successfully installed, the system configuration file may be saved and uploaded.

The USB function only supports the same series of three-layer management switches, and the two-layer management switch does not support this function.

Example

This example shows how to installing the USB flash drive

```
Switch# usb install
```

usb remove

Syntax

usb remove

Parameter

Default

Mode

Privileged EXEC

Usage

Use the command "USB remove" to uninstall the USB flash drive.

The USB function only supports the same series of three-layer management switches, and the two-layer management switch does not support this function.

Example

This example shows how to uninstall the USB flash drive

```
Switch# usb remove
```

37. Surveillance VLAN

surveillance-vlan (Global)

Syntax

surveillance-vlan
no surveillance -vlan

Parameter

Default

Surveillance VLAN is disabled

Mode

Global Configuration

Usage

Use the **surveillance vlan** global configuration command to enable the functional Surveillance VLAN on the device.
Use the **no** form of this command to disable Surveillance VLAN function. You can verify your setting by entering the **show surveillance vlan Privileged EXEC** command.

Example

The following example shows how to enable Surveillance VLAN.

```
Switch(config)# surveillance -vlan
Switch# show surveillance -vlan
Administrate Surveillance VLAN state : disabled
Surveillance VLAN ID         : none (disable)
Surveillance VLAN Aging      : 1440 minutes
Surveillance VLAN CoS          6
Surveillance VLAN 1p Remark: disabled
```

surveillance-vlan (Interface)

Syntax

surveillance-vlan
no surveillance-vlan

Parameter

Default

Disable by default.

Mode

Interface Configuration

Usage

Use the **surveillance vlan** Interface configuration command to enable OUI surveillance VLAN configuration on an interface
Use the **no** form of this command to disable Surveillance VLAN on an interfaces
You can verify your setting by entering the **show surveillance vlan Privileged EXEC** command

Example

The following example how to enable Surveillance VLAN function in oui mode on an interface

```
Switch(config)#interface range gi1-3
Switch(config-if)#surveillance-vlan
Switch# show surveillance-vlan interfaces gi1-3
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
```

```
---------+----------+----------------+----------
gi1      | Disabled |   Auto    | Src
gi2      | Disabled |   Auto    | Src
gi3      | Disabled |   Auto    | Src
```

surveillance-vlan vlan

Syntax

surveillance-vlan vlan <1-4094>
no surveillance-vlan vlan

Parameter

<1-4094>	Specify the Surveillance VLAN ID

Default

The default Surveillance VLAN ID is None.

Mode

Global Configuration

Usage

Use the **surveillance vlan id** global configuration command to configure the VLAN identifier of the surveillance VLAN statically.
Use the **no** form of this command to restore surveillance VLAN id to default. You can verify your setting by entering the **show surveillance vlan Privileged EXEC** command

Example

The following example shows how to set Surveillance VLAN id. The VLAN id must be created first.

```
Switch(config)# surveillance-vlan vlan 128
Switch# show surveillance-vlan
Administrate Surveillance VLAN state : enabled
Surveillance VLAN ID  128
Surveillance VLAN Aging        : 1440 minutes
Surveillance VLAN CoS                  6
Surveillance VLAN 1p Remark: disabled
```

surveillance-vlan oui-table

Syntax

surveillance-vlan oui-table A:B:C [DESCRIPTION]
no surveillance-vlan oui-table [A:B:C]

Parameter

A:B:C	Specify OUI Mac address to add or remove
DESCRIPTION	Specify description of the specified MAC address to the surveillance VLAN OUI table

Default

Default has no pre-defined OUI.

Mode

Global Configuration

Usage

Use the **surveillance vlan oui-table** global configuration command to add OUI mac address to OUI Table
Use the **no** form of this command to remove all or specified OUI mac address..
You can verify your setting by entering the **show surveillance vlan Privileged EXEC** command

Example

This following example shows how to add OUI Mac.

```
Switch(config)# surveillance-vlan oui-table 00:01:02  "Test"
Switch# show surveillance-vlan interfaces gi1-3
Surveillance VLAN Aging        : 1440 minutes
Surveillance VLAN CoS          : 6
Surveillance VLAN 1p Remark: disabled

OUI table
OUI MAC | Description
--------------------+-----------------
00:01:02 | Test


Port     | State| Port Mode | Cos Mode
---------+-----------+-----------------+-----------
gi1| Disabled |          Auto     | Src
gi2| Disabled |          Auto     | Src
gi3| Disabled |          Auto     | Src
```

surveillance-vlan cos (Global)

Syntax

surveillance-vlan cos <0-7> [remark]
no surveillance-vlan cos

Parameter

<0-7>	Specify the surveillance VLAN Class of Service value in telephone OUI mode
remark	Specify that the L2 user priority is remarked with the CoS value

Default

The default cos value is 6, remark is disabled.

Mode

Global Configuration

Usage

Use the **surveillance vlan cos** global configurations command to configure the surveillance VLAN cos value and 1p remark function.
Use the “**no**” form to restore to default mode.
You can verify your setting by entering the **show surveillance vlan Privileged EXEC** command

Example

The following example show how to set cos value and enable 1p remark function

```
Switch(config)# surveillance-vlan cos 7 remark
Switch# show surveillance-vlan
Administrate Surveillance VLAN state : disabled
Surveillance VLAN ID  128
Surveillance VLAN Aging         : 1440 minutes
Surveillance VLAN CoS                      7
Surveillance VLAN 1p Remark: enabled
```

surveillance-vlan cos (Interface)

Syntax

surveillance-vlan cos (src | all)
no surveillance-vlan cos

Parameter

src	Specify QoS attributes are applied to packets with OUIs in the source MAC address.
all	Specify QoS attributes are applied to packets that are classified to the Surveillance VLAN.

Default

The default all port in Src mode.

Mode

Interface configuration

Usage

Use the **surveillance vlan cos mode** Interface configuration command to configure OUI surveillance VLAN cos mode configuration on an interface. Use the “**no**” form to restore to default mode.

You can verify your setting by entering the **show surveillance-vlan interfaces Privileged EXEC** command

Example

The following example how to configure surveillance packet QoS attributes on an interface

```
Switch(config)#interface range gi1-3
Switch(config-if)#surveillance-vlan cos all
Switch# show surveillance-vlan interfaces gi1-3
Surveillance VLAN Aging        : 1440 minutes
Surveillance VLAN CoS                  7
Surveillance VLAN 1p Remark: enabled

OOUI table
OUI MAC | Description
-------------------+-----------------
00:01:02 | Test


Port     | State| Port Mode | Cos Mode
---------+-----------+-----------------+-----------
gi1    | Disabled |        Auto      | All
gi2    | Disabled |        Auto      | All
gi3    | Disabled |        Auto      | All
```

surveillance-vlan mode

Syntax

surveillance-vlan mode (auto|manual)
no surveillance-vlan mode

Parameter

auto	Specifies that the port is identified as a candidate to join the surveillance VLAN. When a packet with a source OUI MAC address that identifies the remote equipment as surveillance equipment is seen on the port, the port joins the surveillance VLAN as a tagged port.
manual	Specifies that the port is manually assigned to the surveillance VLAN.

Default

The default is auto mode.

Mode

Interface Configuration

Usage

Use the **surveillance-vlan mode** global configuration command to configure the surveillance VLAN mode for interface.
Use the “**no**” form to restore to default mode.
You can verify your setting by entering the **show surveillance-vlan interfaces Privileged EXEC** command.

Example

The following example how to configure surveillance mode to manual

```
Switch(config)#interface range gi1-3
Switch(config-if)#surveillance-vlan mode manaul
Switch# show surveillance-vlan interfaces gi1-3
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
---------+-----------+-----------------+-----------
gi1 | Disabled | Manual    | Src
gi2 | Disabled | Manual    | Src
gi3 | Disabled | Manual    | Src
```

surveillance-vlan aging-time

Syntax

surveillance-vlan aing-time <30-65536>
no surveillance-vlan aing-time

Parameter

<30-65536>	Specify the Surveillance VLAN aging timeout interval in minutes

Default

The default aging-timeout value is 1440 minutes

Mode

Global Configuration

Usage

Use the **surveillance vlan aging-time** global configuration command to configure the surveillance VLAN aging timeout.
Use the “**no**” form to restore to default time.
You can verify your setting by entering the **show surveillance vlan Privileged EXEC** command

Example

The following example shows how to set aging time.

```
Switch(config)# surveillance-vlan aging-time 720
Switch# show surveillance-vlan
Administrate Surveillance VLAN state : disabled
Surveillance VLAN ID  1
Surveillance VLAN Aging        : 720 minutes
Surveillance VLAN CoS                    5
Surveillance VLAN 1p Remark: enabled
```

show surveillance-vlan

Syntax

show surveillance-vlan
show surveillance-vlan interfaces [IF_PORTS]

Parameter

IF_PORTS	Specifies interfaces to display surveillance VLAN settings in OUI mode

Default

Mode

Privileged EXEC

Usage

Use the **show surveillance vlan** command in EXEC mode to display the surveillance VLAN status for all interfaces or for a specific interface if the surveillance VLAN type is OUI

Example

The following example show how to display surveillance vlan OUI mode settings

```
Switch# show surveillance-vlan
Administrate Surveillance VLAN state : disabled
Surveillance VLAN ID  : none (disable)
Surveillance VLAN Aging                    : 720 minutes
Surveillance VLAN CoS                             6
Surveillance VLAN 1p Remark: disabled

Switch# show surveillance-vlan interfaces gi1-4
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
---------+-----------+-----------------+-----------
gi1    | Disabled |        Auto      | Src
gi2    | Disabled |        Auto      | Src
gi3    | Disabled |        Auto      | Src
```

38. 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 (jan|feb|mar|apr |may|jun|jul|aug| sep|oct|nov|dec) <1-31> <2000-	Specify static time of year, month, day, hour, minute,second

Default

No default is defined.
The clock set to 2000/01/01 08:00:00 by default at startup.

Mode

Privileged EXEC

Usage

Use the **clock set** command to set static time. The static time won’t save to configuration file. You can verify your setting by entering the **show clock Privileged EXEC** command.

Example

The example shows how to set static time of switch.

```
switch# clock set 11:03:00 sep 21 2012
11:03:00 DFL(UTC+8) Sep 21 2012

switch# show clock
11:03:21 DFL(UTC+8) Sep 21 2012
```

```
No time source
```

clock timezone

Syntax

clock timezone ACRONYM HOUR-OFFSET [minutes <0-59>]
no clock timezone

Parameter

ACRONYM	Specify acronym name of time zone
HOUR-OFFSET	Specify hour offset of time zone
Minutes <1-59>	Specify minute offset of time zone

Default

Default time zone is UTC+8.

Mode

Global Configuration

Usage

Use the **clock timezone** command to set timezone setting.
Use the **no** form of this command to restore to default setting.
You can verify your setting by entering the **show clock detail Privileged EXEC** command.

Example

The example shows how to set time zone of switch and then restore to default time zone.

```
switch(config)# clock timezone test +5
switch(config)# show clock detail
10:13:27 test(UTC+5) Sep 21 2012
No time source

Time zone: Acronym is test Offset is UTC+5
```

```
switch(config)# no clock timezone
switch(config)# show clock detail
13:14:50 DFL(UTC+8) Sep 21 2012
No time source

Time zone: Acronym is DFL Offset is UTC+8
```

clock source

Syntax

clock source (local|sntp)

Parameter

local	Specify to use static time
sntp	Specify to use sntp time

Default

Default is using local time.

Mode

Global Configuration

Usage

Use the **clock source** command to set the source of time.
Use the no form of this command to restore to default setting.
You can verify your setting by entering the **show clock detail Privileged EXEC** command.

Example

The example shows how to set clock source of switch.

```
switch(config)# clock source sntp
switch(config)# show clock detail
08:32:12 test(UTC+5) Sep 21 2012
Time source is sntp
```

Time zone: Acronym is DFL Offset is UTC+8

clock summer-time

Syntax

clock summer-time *ACRONYM* **date** (**jan** | **feb** | **mar** | **apr** | **may** | **jun** | **jul** | **aug** | **sep** | **oct** | **nov** | **dec**) *<1-31> <2000-2037>HH:MM* (**jan** | **feb** | **mar** | **apr** | **may** | **jun** | **jul** | **aug** | **sep** | **oct** | **nov** | **dec**) *<1-31> <2000-2037> HH:MM [<1-1440>*]
clock summer-time *ACRONYM* **recurring (usa|eu)** [*<1-1440>*] **clock summer-time** *ACRONYM* **recurring** (*<1-5>* | **first** | **last**) (**sun** | **mon** | **tue** | **wed** | **thu** | **fri** | **sat**) (**jan** | **feb** | **mar** | **apr** | **may** | **jun** | **jul** | **aug** | **sep** | **oct** | **nov** | **dec**) *HH:MM* (*<1-5>* | **first** | **last**) (**sun** | **mon** | **tue** | **wed** | **thu** | **fri** | **sat**) (**jan** | **feb** | **mar** | **apr** | **may** | **jun** | **jul** | **aug** | **sep** | **oct** | **nov** | **dec**) *HH:MM* [*<1-1440>*]
no clock summer-time

Parameter

ACRONYM	Specify acronym name of time zone
date	Non recurring daylight saving time duration
<1-1440>	Adjust daylight saving time offset
usa	Using daylight saving time in the United States that starts on the second Sunday of March and ends on the first Sunday of November
eu	Using daylight saving time in the Europe that starts on the last Sunday in March and ending on the last Sunday in October
recurring	Specify ecurring daylight saving time duration.

Default

No default daylight saving time is defined.

Mode

Global Configuration

Usage

Use the **clock summer-time** command to set daylight saving time for system time. The “**usa**” or “**eu**” means that use the global daylight saving policy which defined by international organization. In both the “**date**”and “**recurring**”, the first part of the command specifies when summer time begins, and the second part specifies when it ends. All times are relative to the local time zone. The “**recurring**” means that adjust time every year within the month.

Use the no form of this command to default setting.

You can verify your setting by entering the **show clock detail Privileged EXEC** command.

Example

The example shows how to set clock summer time of switch. You can verify settings by the following show show clock command.

```
switch(config)# clock summer-time test recurring usa
switch(config)# show clock detail
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.
```

Sntp

Syntax

sntp host HOSTNAME [port <1-65535>]
no sntp

Parameter

HOSTNAME	Specify ip address or hostname of sntp server
sntp	Specify server port of sntp server

Default

No default SNTP server defined. Default server port is 123 when server created.

Mode

Global Configuration

Usage

Use the sntp command to set remote SNTP server. Use the no form of this command to default setting.
You can verify your setting by entering the **show sntp Privileged EXEC** command.

Example

The example shows how to set remote SNTP server of switch.

```
switch(config)# clock source sntp
switch(config)# sntp host 192.168.1.100
switch(config)# show sntp
SNTP is Enabled
SNTP Server address: 192.168.1.100
SNTP Server port: 123
```

show 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)# show clock
14:34:43 DLS(UTC+9) Sep 25 2012
Time source is sntp
```

show sntp

Syntax

show sntp

Parameter

Default

Mode

Privileged EXEC

Usage

Use the **show sntp** command to remote SNTP server information.

Example

The example shows how to show remote SNTP server.

```
Switch334455(config)# show sntp
SNTP is Enabled
SNTP Server address: 192.168.1.100
SNTP Server port: 123
```

39. UDLD

udld

Syntax

udld
no udld

Parameter

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

Default

UDLD aggressive mode is disabled by default.

Mode

Interface Configuration

Usage

Use the **udld aggressive** command to enable UniDirectional Link Detection (UDLD) aggressive mode of interface.

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

You can verify your setting by entering the **show udld interface Privileged EXEC** command.

Example

The example shows how to enable udld aggressive mode in interface gi1.

```
switch(config)# interface gi1
switch(config-if)# udld
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
```

udld message time

Syntax

udld message time *message-time-interval*

Parameter

message-time-interval	Specify the interval for sending message.Range is 1 -90 seconds.

Default

Default interval is 15 seconds.

Mode

Global Configuration

Usage

Use the **udld message time** to set interval of UniDirectional Link Detection (UDLD) sent message.

Example

The example shows how to set interval of UniDirectional Link Detection (UDLD) message.

```
switch(config)# udld message time 30
```

udld reset

Syntax

udld reset

Parameter

Default

No default is defined

Mode

Privileged EXEC

Usage

Use the **udld reset** command to reset all interfaces disabled by the UniDirectional Link Detection (UDLD) and permit traffic to begin passing through them again.
If the interface configuration is still enabled for UDLD, these ports begin to run UDLD again and are disabled for the same reason if the problem has not been corrected.

Example

The example shows how to reset all interfaces disabled by UDLD

```
Switch# udld reset
1 ports shutdown by UDLD were reset.
```

show udld

Syntax

show udld
show udld interfaces *IF_NMLPORTS*

Parameter

IF_NMLPORTS	Specify the normal interfaces to display udld information

Default

No default is defined

Mode

Privileged EXEC

Usage

Use the **show udld** command to to display UniDirectional Link Detection (UDLD) administrative and operational status for all ports or the specified port.

Example

The example shows how to show UniDirectional Link Detection (UDLD) settings and operational status of interface gi1.

```
Switch# show udld interfaces g1
```

```
Interface gi1
---
Port enable administrative configuration setting: Enabled / in aggressive mode
Port enable operational state: Enabled / in aggressive mode
Current bidirectional state: Unknown
Current operational state: Advertisement
Message interval: 7
Time out interval: 5
No neighbor cache information stored
```

40. VLAN

vlan

Syntax

vlan
no vlan

Parameter

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# show vlan
VID | VLAN Name | Untagged Ports | Tagged Ports | Type
-------+----------------------------+----------------------------+---------------------+---------
1 |     default       | gi1-48,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

Mode

Port Configuration

Usage

The VLAN mode is used to configure the port for different port role.
Access port: Accepts only untagged frames and join an untagged VLAN.
Hybrid port: Support all functions as defined in IEEE 802.1Q specification.
Trunk port: An untagged member of one VLAN at most, and is a tagged member of zero or more VLANs. If it is an uplink port, it can recognize double tagging on this port.
Tunnel port: Port-based Q-in-Q mode.

Use the **switch mode** port configuration command to set mode of interface You can verify your setting by entering the **show interfaces switchport Privileged EXEC** command.

Example

This example sets VLAN mode to Access port.

```
Switch(config)# interface gi12
Switch(config-if)# switchport mode access
Switch# show interfaces switchport gi12
Port : gi12
Port Mode : Access
Ingress Filtering : enabled
Acceptable Frame Type : untagged-only
Ingress UnTagged VLAN ( NATIVE ) : 1
Trunking VLANs Enabled:

Port is member in:
Vlan    Name  Egress rule
------- ---------------------- ----------------
1    default     Untagged

Forbidden VLANs:
Vlan Name
------- ----------------------
```

switchport hybrid pvid

Syntax

switchport hybrid pvid <1-4094>

Parameter

<1-4094>	Specify the port-based VLAN ID on the Hybrid port.

Default

Default pivd is 1.

Mode

Port Configuration

Usage

Use the **switch hybrid pivd** port configuration command to set pvid of interface.
You can verify your setting by entering the **show interfaces switchport Privileged EXEC** command.

Example

This example sets PVID to 100.

```
SwitchEF0101(config)# interface gi10
SwitchEF0101(config-if)# switchport mode hybrid
SwitchEF0101(config-if)# switchport hybrid pvid 100
SwitchEF0101# show interfaces switchport fa10
Port : gi10
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
```

switchport hybrid ingress-filtering

Syntax

switchport bybrid ingress-filtering
no switchport hybrid ingress-filtering

Parameter

Default

Default is enabled

Mode

Port Configuration

Usage

Use the **switchport hybrid ingress-filtering** port configuration command to enable vlan ingress filter.

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

You can verify your setting by entering thes **show interfaces switchport Privileged EXEC** command.

Example

This example sets ingress-filtering to disable.

```
SwitchEF0101(config)# interface gi10
SwitchEF0101(config-if)# switchport mode hybrid
SwitchEF0101(config-if)#no switchport hybrid ingress-filtering
SwitchEF0101# show interfaces switchport gi10
Port : gi10
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
```

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
```

switchport hybrid allowed vlan

Syntax

switchport hybrid allowed vlan add *VLAN-LIST* **[(tagged|untagged)]**
switchport hybrid allowed vlan remove *VLAN-LIST*

Parameter

VLAN-LIST	Specifies the VLAN list to be added or remove.
(tagged |untagged)	Specifies the member type is tagged or untagged.

Default

Only vlan 1 is untagged member by default. Default is tagged member when added.

Mode

Port Configuration

Usage

Use the **switchport hybrid allow vlan add** port configuration command to allow vlan on interface.
Use the **switchport hybrid allow vlan remove** port configuration command to remove vlan on interface.
You can verify your setting by entering the **s show interfaces switchport Privileged EXEC** command.

Example

This example sets port fa10 VLAN to join the VLAN 100 as tagged member.

```
Switch(config)# interface gi10
Switch(config-if)# switchport hybrid allowed vlan add 100-105
Switch(config-if)# switchport hybrid allowed vlan remove 105
Switch# show interfaces switchport gi10
Port : gi10
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
       VLAN-one-hundred Tagged
```

```
VLAN0101    Tagged
VLAN0102    Tagged
VLAN0103    Tagged
VLAN0104    Tagged

Forbidden VLANs:
Vlan  Name
------- -----------------------
```

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 gi10 native VLAN ID to 100.

```
Switch(config)# interface gi10
Switch(config-if)# switchport mode access
Switch(config-if)# switchport access vlan 100
Switch# show interfaces switchport gi10
Port : gi10
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 gi10 native VLAN to 100.

```
Switch(config)# interface gi10
Switch(config-if)# switchport mode tunnel
Switch(config-if)# switchport tunnel vlan 100
Switch# show interfaces switchport gi10
Port : gi10
Port Mode : Tunnel Ingress Filtering : enabled
Acceptable Frame Type : all
Ingress UnTagged VLAN ( NATIVE ) : 100
Trunking VLANs Enabled:

Port is member in:
Vlan Name     Egress rule
------- -----------------------     -----------------
100 VLAN-one-hundred Untagged

Forbidden VLANs:
Vlan  Name
  ------- -----------------------
```

switchport trunk native vlan

Syntax

switchport trunk native vlan <1-4094>
no switchport trunk native vlan

Parameter

<1-4094>	Specifies the native VLAN ID.

Default

Default is vlan 1

Mode

Port Configuration

Usage

Use the **switchport trunk native vlan** port configuration command to set native vlan on interface. Use the **no** form of this command to restore to default vlan.
You can verify your setting by entering the **s show interfaces switchport Privileged EXEC** command.

Example

This example sets Trunk port gi10 native VLAN to 100.

```
Switch(config)# interface gi10
Switch(config-if)# switchport mode trunk
Switch(config-if)# switchport trunk native vlan 100
Switch# show interfaces switchport gi10
Port : gi10
Port Mode : Trunk Ingress Filtering : enabled
   Acceptable Frame Type : all
Ingress UnTagged VLAN ( NATIVE ) : 100
Trunking VLANs Enabled:

Port is member in:
Vlan Name     Egress rule
------- -----------------------     -----------------
100 VLAN-one-hundred Untagged

Forbidden VLANs:
Vlan  Name
```

switchport trunk allowed vlan

Syntax

switchport trunk allowed vlan (add | remove) (VLAN-LIST | all)

Parameter

(add | remove)	Specify the action to add or remove the allowed VLAN list.
(VLAN-LIST | all)	Specify the VLAN list or all VLANs to be added or removed.

Default

Default is vlan 1

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 gi10 to add the allowed VLAN 100.

```
Switch(config)# interface gi10
Switch(config-if)# switchport trunk allowed vlan add 100
Switch# show interfaces switchport gi10
Port : gi10
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

Default

Default is untagged

Mode

Port Configuration

Usage

Use the **switchport default vlan tagged** port configuration command to become default vlantaggedmember.
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 gi10 membership with the default VLAN to tag.

```
Switch(config)# interface gi10
Switch(config-if)# switchport default-vlan tagged
Switch# show interfaces switchport gi10
Port : gi10
Port Mode : Hybrid Ingress Filtering : enabled
Acceptable Frame Type : all
Ingress UnTagged VLAN ( NATIVE ) : 1
Trunking VLANs Enabled:

Port is member in:
Vlan    Name  Egress rule
------- ---------------------- ----------------
1    default      Tagged

Forbidden VLANs:
Vlan Name
   ------- ----------------------
```

switchport forbidden default-vlan

Syntax

switchport forbidden default-vlan

no switchport forbidden default-vlan

Parameter

Default

Default is allowed

Mode

Port Configuration

Usage

Use the **switchport forbidden default-vlan** port configuration command to forbid default-vlan on interface.
Use the **no switchport forbidden default-vlan** port configuration command to restore to default
You can verify your setting by entering the **s show interfaces switchport Privileged EXEC** command

Example

This example sets the membership of the default VLAN with port gi10 to forbidden.

```
Switch(config)# interface gi10
Switch(config-if)# switchport forbidden default-vlan
Switch# show interfaces switchport gi10
Port : gi10
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
------- ---------------------- ----------------
```

```
Forbidden VLANs:
Vlan  Name
------- -----------------------
1       default
```

switchport forbidden vlan

Syntax

switchport forbidden vlan (add | remove) *VLAN-LIST*

Parameter

(add | remove)	Add or remove forbidden membership.
VLAN-LIST	Specify the VLAN list.

Default

No vlan is forbidden by default

Mode

Port Configuration

Usage

Use the **switchport forbidden vlan add** port configuration command to forbid vlan on interface.
Use the **switchport forbidden vlan remove** port configuration command to accpet vlan on interface.
You can verify your setting by entering the **s show interfaces switchport Privileged EXEC** command

Example

This example sets the membership of the VLAN 100 with port gi10 to forbidden.

```
Switch(config)# interface gi10
Switch(config-if)# switchport forbidden vlan add 100
Switch# show interfaces switchport gi10
```

```
Port : gi10
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
```

switchport vlan tpid

Syntax

switchport vlan tpid (0x8100|0x88a8|0x9100|0x9200)

Parameter

(0x8100|0x88a8|0x9100|0x9200)	Select TPID to set.

Default

Default TPID is 0x8100

Mode

Port Configuration

Usage

Use the **switchport vlan tpid** port configuration command to set TPID on interface.
You can verify your setting by entering the **s show running-config Privileged EXEC** command

Example

This example sets the TPID to 0x9100 on interface gi10.

```
Switch(config)# interface gi10
Switch(config-if)# switchport vlan tpid 0x9100
```

management-vlan

Syntax

management-vlan vlan <1-4094>
no management-vlan

Parameter

<1-4094>	Specify the VLAN ID of management-vlan.

Default

Default management vlan is 1.

Mode

Global Configuration

Usage

Use the **management vlan** Global Configuration mode command to set management vlan id. Vlan id must be created first.

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

You can verify your setting by entering the **show management-vlan Privileged EXEC** command

Example

The following example specifies that management vlan 2 is created

```
Switch(config)#vlan 2
Switch(config)# management-vlan vlan 2
```

The following example specifies that management-vlan is restored to be default VLAN.

```
Switch(config)# no management-vlan
```

show vlan

Syntax

show vlan [(*VLAN-LIST*|dynamic|static)]

Parameter

(*VLAN-LIST*|dynamic|static)	Specify vlan id to show information or show all static or dynamic vlan entries.

Default

Mode

Privileged EXEC

Usage

Display information about vlan entry

Example

The following example specifies that show vlan

```
Switch# show vlan
VID | VLAN Name | Untagged Port | Tagged Port | Type
-------+-------------------------+-------------------------+---------------+---------
 1 |default       | fa1-8,fa10-48,lag1-8 |--- | Default
 100 | VLAN-one-hundred |    --- |       --- | Static
 101 |              VLAN0101 |    --- |     --- | Static
  102 |           VLAN0102 |      --- |     --- | Static
```

show vlan interface membership

Syntax

show vlan VLAN-LIST interfaces IF_PORTS membership

Parameter

<VLAN-List>	Specify vlan to show
IF_PORTS	Specify interface is to show

Default

Mode

Privileged EXEC

Usage

Display information about vlan membership on interfaces.

Example

The following example specifies that show vlan interface membership

```
Switch# show vlan 100 interfaces gi10 membership
VLAN ID : 100
VLAN Type : Static
---------+--------------
Port     | Membership
---------+--------------
gi10 | Excluded
---------+--------------
```

show interface switchport

Syntax

show interface switchport interfaces *IF_PORTS*

Parameter

IF_PORTS	Specify interfaces protocol vlan to display

Default

Mode

Privileged EXEC

Usage

Display information about default vlan

Example

The following example specifies that show interfacce switchport.

```
Switch(config)# interface gi10
Switch(config-if)# switchport trunk allowed vlan add 100
Switch# show interfaces switchport gi10
Port : gi10
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
```

show management-vlan

Syntax

show management-vlan

Parameter

Default

Mode

Privileged EXEC

Usage

Display information about management vlan

Example

The following example specifies that show management vlan

```
Switch(config)# show management-vlan
Management VLAN-ID : default(1)
```

41. Voice VLAN

voice-vlan (Global)

Syntax

voice-vlan
no voice-vlan

Parameter

Default

Voice VLAN is disabled

Mode

Global Configuration

Usage

Use the **voice vlan** global configuration command to enable the functional Voice VLAN on the device.
Use the **no** form of this command to disable voice vlan function.
You can verify your setting by entering the **show voice vlan Privileged EXEC** command.

Example

The following example shows how to enable voice vlan.

```
Switch(config)# voice-vlan
Switch# show voice-vlan
Administrate Voice VLAN state : disabled
Voice VLAN ID           : none (disable)
Voice VLAN Aging        : 1440 minutes
Voice VLAN CoS                    6
Voice VLAN 1p Remark: disabled
```

voice-vlan (Interface)

Syntax

voice-vlan
no voice-vlan

Parameter

Default

The default all port admin-staus is disabled.

Mode

Interface Configuration

Usage

Use the **voice vlan** Interface configuration command to enable OUI voice VLAN configuration on an interface
Use the **no** form of this command to disable voice vlan on an interfaces You can verify your setting

by entering the **show voice vlan Privileged EXEC** command

Example

The following example how to enable voice VLAN function in oui mode on an interface

```
Switch(config)#interface range gi1-3
Switch(config-if)#voice-vlan
Switch# show voice-vlan interfaces gi1-8
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
-------+----------+-------------+-----------
gi1     | Disabled |      Auto       | Src
gi2     | Disabled |      Auto       | Src
gi3     | Disabled |      Auto       | Src
gi4     | Disabled |      Auto       | Src
gi5     | Disabled |      Auto       | Src
gi6     | Disabled |      Auto       | Src
gi7     | Disabled |      Auto       | Src
gi8     | Disabled |      Auto       | Src
```

voice-vlan vlan

Syntax

voice-vlan vlan <1-4094>
no voice-vlan vlan

Parameter

<1-4094>	Specify the voice VLAN ID

Default

The default Voice VLAN ID is None.

Mode

Global Configuration

Usage

Use the **voice vlan id** global configuration command to configure the VLAN identifier of the voice VLAN statically.
Use the **no** form of this command to restore voice vlan id to default. You can verify your setting by entering the **show voice vlan Privileged EXEC** command

Example

The following example shows how to set Voice vlan id. The vlan id must be created first.

```
Switch(config)# voice-vlan vlan 128
Switch# show voice-vlan
Administrate Voice VLAN state : enabled
Voice VLAN ID          128
Voice VLAN Aging       : 1440 minutes
Voice VLAN CoS                 6
Voice VLAN 1p Remark: disabled
```

voice-vlan oui-table

Syntax

voice-vlan oui-table *A:B:C* [*DESCRIPTION*]
no voice-vlan oui-table [*A:B:C*]

Parameter

A:B:C	Specify OUI Mac address to add or remove

DESCRIPTION	Specify description of the specified MAC address to the voice VLAN OUI table

Default

The system default has 8 oui addresses.

Mode

Global Configuration

Usage

Use the **voice vlan oui-table** global configuration command to add oui mac address to OUI Table Use the **no** form of this command to remove all or specified oui mac address.. You can verify your setting by entering the **show voice vlan Privileged EXEC** command

Example

This following example shows how to add OUI Mac.

```
Switch(config)# voice-vlan oui-table 00:01:02  “Test”
Switch# show voice-vlan interfaces all
Voice VLAN Aging      : 1440 minutes
Voice VLAN CoS                    6
Voice VLAN 1p Remark: disabled

OUI table
OUI MAC | Description
-------------------+-----------------
00:E0:BB | 3COM
00:03:6B | Cisco
00:E0:75 | Veritel
00:D0:1E | Pingtel
00:01:E3 | Siemens
00:60:B9 | NEC/Philips
00:0F:E2 | H3C
00:09:6E | Avaya
00:01:02 | Test

Port    | State  | Port Mode | Cos Mode
---------+-----------+------------------+-----------
gi1    | 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

<0-7>	Specify the voice VLAN Class of Service value in telephone oui mode
remark	Specify that the L2 user priority is remarked with the CoS value

Default

The default cos value is 6, remark is disabled.

Mode

Global Configuration

Usage

Use the **voice vlan cos** global configuration command to configure the voice VLAN cos value and 1p remark function
Use the “**no**” form to restore to default mode.
You can verify your setting by entering the **show voice vlan Privileged EXEC** command

Example

The following example show how to set cos value and enable 1p remark function

```
Switch(config)# voice-vlan cos 7 remark
Switch# show voice-vlan
Administrate Voice VLAN state : disabled
Voice VLAN ID              128
Voice VLAN Aging      : 1440 minutes
Voice VLAN CoS              7
Voice VLAN 1p Remark: enabled
```

voice-vlan cos (Interface)

Syntax

voice-vlan cos (src | all)
no voice-vlan cos

Parameter

src	Specify QoS attributes are applied to packets with OUIs in the source MAC address.
All	Specify QoS attributes are applied to packets that are classified to the Voice VLAN.

Default

The default all port in Src mode.

Mode

Interface configuration

Usage

Use the **voice vlan cos** Interface configuration command to configure OUI voice VLAN cos mode configuration on an interface
Use the “**no**” form to restore to default mode.
You can verify your setting by entering the **show voice-vlan interfaces Privileged EXEC** command

Example

The following example how to configure voice packet QoS attributes on an interface

```
Switch(config)#interface range gi1-3
Switch(config-if)#voice-vlan cos all
Switch# show voice-vlan interfaces gi1-8
Voice VLAN Aging       : 1440 minutes
Voice VLAN CoS          : 6
Voice VLAN 1p Remark: disabled

OUI table
    OUI MAC       |      Description
--------------+-----------------
    00:E0:BB     | 3COM
    00:03:6B     | Cisco
    00:E0:75     | Veritel
    00:D0:1E      | Pingtel
    00:01:E3     | Siemens
    00:60:B9     | NEC/Philips
    00:0F:E2     | H3C
    00:09:6E     | Avaya

  Port | State       | Port Mode     | Cos Mode
-------+----------+-------------+-----------
gi1      | Disabled |      Auto        | All
gi2      | Disabled |      Auto        | All
gi3      | Disabled |      Auto        | All
gi4      | Disabled |      Auto        | Src
gi5      | Disabled |      Auto        | Src
gi6      | Disabled |      Auto        | Src
gi7      | Disabled |      Auto        | Src
gi8      | Disabled |      Auto        | Src
```

voice-vlan mode

Syntax

voice-vlan mode (auto|manual)
no voice-vlan mode

Parameter

auto	Specifies that the port is identified as a candidate to join the voice VLAN. When a packet with a source OUI MAC address that identifies the remote equipment as voice equipment is seen on the port, the port joins the voice VLAN as a tagged port.
manual	Specifies that the port is manually assigned to the voice VLAN.

Default

The default is auto mode.

Mode

Interface Configuration

Usage

Use the **voice-vlan mode** global configuration command to configure the voice VLAN mode for interface.
Use the “**no**” form to restore to default mode.
You can verify your setting by entering the **show voice-vlan interfaces Privileged EXEC** command.

Example

The following example how to configure voice mode to manual

```
Switch(config)#interface range gi1-3
Switch(config-if)#voice-vlan mode manaul
Switch# show voice-vlan interfaces gi1-8
Voice VLAN Aging       : 1440 minutes
Voice VLAN CoS         : 6
Voice VLAN 1p Remark: disabled

OUI table
    OUI MAC       |     Description
--------------+-----------------
    00:E0:BB     | 3COM
    00:03:6B     | Cisco
    00:E0:75     | Veritel
    00:D0:1E     | Pingtel
    00:01:E3     | Siemens
    00:60:B9     | NEC/Philips
    00:0F:E2     | H3C
    00:09:6E     | Avaya

   Port | State       | Port Mode     | Cos Mode
-------+----------+-------------+-----------
gi1      | Disabled |      manaul        | All
gi2      | Disabled |      manaul        | All
gi3      | Disabled |      manaul        | All
gi4      | Disabled |      Auto        | Src
gi5      | Disabled |      Auto        | Src
gi6      | Disabled |      Auto        | Src
gi7      | Disabled |      Auto        | Src
gi8      | Disabled |      Auto        | Src
```

voice-vlan aging-time

Syntax

voice-vlan aing-time <30-65536>
no voice-vlan aing-time

Parameter

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

Default

The default aging-timeout value is 1440 minutes

Mode

Global Configuration

Usage

Use the **voice vlan aging-time** global configuration command to configure the voice VLAN aging timeout.
Use the “**no**” form to restore to default time.
You can verify your setting by entering the **show voice vlan Privileged EXEC** command

Example

The following example shows how to set aging time.

```
Switch(config)# voice-vlan aging-time 720
Switch# show voice-vlan
Administrate Voice VLAN state : disabled
Voice VLAN ID          1
Voice VLAN Aging       : 720 minutes
Voice VLAN CoS                   5
Voice VLAN 1p Remark: enabled
```

show voice-vlan

Syntax

show voice-vlan
show voice-vlan interfaces [IF_PORTS]

Parameter

IF_PORTS	Specifies intefaces to display voice VLAN settings in oui mode

Default

Mode

Privileged EXEC

Usage

Use the **show voice vlan** command in EXEC mode to display the voice VLAN status for all interfaces or for a specific interface if the voice VLAN type is OUI

Example

The following example show how to display voice vlan oui mode settings

```
Switch# show voice-vlan
Administrate Voice VLAN state : disabled
 Voice  VLAN  ID  :  none  (disable)  Voice  VLAN  Aging  :
 720 minutes
 Voice VLAN CoS 6
 Voice VLAN 1p Remark: disabled

 Switch# show voice-vlan interfaces gi1-4 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
----------+-----------+-----------------+-----------
gi1    | Disabled |    Auto      | Src
gi2    | Disabled |    Auto      | Src
gi3    | Disabled |     Auto      | Src
 gi4    | Disabled |     Auto      | Src
```