Content

CHAPTER 1 COMMANDS FOR NETWORK PORT CONFIGURATION 1-1

1.1 COMMANDS FOR ETHERNET PORT CONFIGURATION 1-1

1.1.1 bandwidth 1-1
1.1.2 combo-forced-mode 1-1
1.1.3 clear counters interface 1-2
1.1.4 flow control 1-3
1.1.5 interface ethernet 1-3
1.1.6 loopback 1-4
1.1.7 mdi 1-4
1.1.8 name 1-4
1.1.9 negotiation 1-5
1.1.10 port-rate-statistics interval 1-5
1.1.11 port-scan-mode 1-6
1.1.12 port-status query interval 1-6
1.1.13 rate-suppression 1-6
1.1.14 rate-violation 1-7
1.1.15 rate-violation control 1-8
1.1.16 remote-statistics interval 1-8
1.1.17 show interface 1-8
1.1.18 shutdown 1-11
1.1.19 speed-duplex 1-11
1.1.20 virtual-cable-test 1-12

CHAPTER 2 COMMANDS FOR PORT ISOLATION FUNCTION 2-1

2.1 ISOLATE-PORT GROUP 2-1

2.2 ISOLATE-PORT GROUP SWITCHPORT INTERFACE 2-1

2.3 ISOLATE-PORT APPLY 2-2

2.4 SHOW ISOLATE-PORT GROUP 2-2

CHAPTER 3 COMMANDS FOR PORT LOOPBACK DETECTION FUNCTION....3-1

3.1 DEBUG LOOPBACK-DETECTION....3-1
3.2 LOOPBACK-DETECTION CONTROL....3-1
3.3 LOOPBACK-DETECTION CONTROL-RECOVERY TIMEOUT....3-2
3.4 LOOPBACK-DETECTION INTERVAL-TIME....3-2
3.5 LOOPBACK-DETECTION SPECIFIED-VLAN....3-3
3.6 SHOW LOOPBACK-DETECTION....3-3

CHAPTER 4 COMMANDS FOR ULDP....4-1

4.1 DEBUG ULDP....4-1
4.2 DEBUG ULDP ERROR....4-1
4.3 DEBUG ULDP EVENT....4-2
4.4 DEBUG ULDP FSM INTERFACE ETHERNET....4-2
4.5 DEBUG ULDP INTERFACE ETHERNET....4-2
4.6 DEBUG ULDP PACKET....4-3
4.7 ULDP AGGRESSIVE-MODE....4-3
4.8 ULDP ENABLE....4-3
4.9 ULDP DISABLE....4-4
4.10 ULDP HELLO-INTERVAL....4-4
4.11 ULDP MANUAL-SHUTDOWN....4-5
4.12 ULDP RECOVERY-TIME....4-5
4.13 ULDP RESET....4-5
4.14 SHOW ULDP....4-6

CHAPTER 5 COMMANDS FOR LLDP FUNCTION....5-1

5.1 CLEAR LLDP REMOTE-TABLE....5-1
5.2 DEBUG LLDP....5-1
5.3 DEBUG LLDP PACKETS....5-1

5.4 LLDP ENABLE 5-2
5.5 LLDP ENABLE (PORT) 5-2
5.6 LLDP MODE 5-3
5.7 LLDP MSGTXHOLD 5-3
5.8 LLDP NEIGHBORS MAX-NUM 5-3
5.9 LLDP NOTIFICATION INTERVAL 5-4
5.10 LLDP TOOMANYNEIGHBORS 5-4
5.11 LLDP TRANSMIT DELAY 5-5
5.12 LLDP TRANSMIT OPTIONAL TLV 5-5
5.13 LLDP TRAP 5-6
5.14 LLDP TX-INTERVAL 5-6
5.15 SHOW DEBUGGING LLDP 5-7
5.16 SHOW LLDP 5-7
5.17 SHOW LLDP INTERFACE ETHERNET 5-8
5.18 SHOW LLDP NEIGHBORS INTERFACE ETHERNET 5-8
5.19 SHOW LLDP TRAFFIC 5-9

CHAPTER 6 COMMANDS FOR PORT CHANNEL 6-1

6.1 DEBUG PORT-CHANNEL 6-1
6.2 INTERFACE PORT-CHANNEL 6-1
6.3 LACP PORT-PRIORITY 6-2
6.4 LACP SYSTEM-PRIORITY 6-2
6.5 LACP TIMEOUT 6-3
6.6 LOAD-BALANCE 6-3
6.7 PORT-GROUP 6-4
6.8 PORT-GROUP MODE 6-4
6.9 SHOW PORT-GROUP 6-5

CHAPTER 7 COMMANDS FOR JUMBO 7-1

7.1 JUMBO ENABLE 7-1

CHAPTER 8 COMMANDS FOR EFM OAM 8-1

8.1 CLEAR ETHERNET-OAM 8-1

8.2 DEBUG ETHERNET-OAM ERROR 8-1

8.3 DEBUG ETHERNET-OAM FSM 8-1

8.4 DEBUG ETHERNET-OAM PACKET 8-2

8.5 DEBUG ETHERNET-OAM TIMER 8-2

8.6 ETHERNET-OAM 8-3

8.7 ETHERNET-OAM ERRORED-FRAME THRESHOLD HIGH 8-3

8.8 ETHERNET-OAM ERRORED-FRAME THRESHOLD LOW 8-3

8.9 ETHERNET-OAM ERRORED-FRAME WINDOW 8-4

8.10 ETHERNET-OAM ERRORED-FRAME-PERIOD THRESHOLD HIGH 8-4

8.11 ETHERNET-OAM ERRORED-FRAME-PERIOD THRESHOLD LOW 8-5

8.12 ETHERNET-OAM ERRORED-FRAME-PERIOD WINDOW 8-5

8.13 ETHERNET-OAM ERRORED-FRAME-SECONDS THRESHOLD HIGH 8-6

8.14 ETHERNET-OAM ERRORED-FRAME-SECONDS THRESHOLD LOW 8-6

8.15 ETHERNET-OAM ERRORED-FRAME-SECONDS WINDOW 8-7

8.16 ETHERNET-OAM ERRORED-SYMBOL-PERIOD THRESHOLD HIGH 8-7

8.17 ETHERNET-OAM ERRORED-SYMBOL-PERIOD THRESHOLD LOW 8-8

8.18 ETHERNET-OAM ERRORED-SYMBOL-PERIOD WINDOW 8-8

8.19 ETHERNET-OAM LINK-MONITOR 8-9

8.20 ETHERNET-OAM MODE 8-9

8.21 ETHERNET-OAM PERIOD 8-10

8.22 ETHERNET-OAM REMOTE-FAILURE 8-10

8.23 ETHERNET-OAM REMOTE-LOOPBACK 8-11

8.24 ETHERNET-OAM REMOTE-LOOPBACK SUPPORTED 8-11

8.25 ETHERNET-OAM TIMEOUT 8-11

8.26 SHOW ETHERNET-OAM 8-11

8.27 SHOW ETHERNET-OAM EVENTS 8-16

8.28 SHOW ETHERNET-OAM LINK-EVENTS CONFIGURATION 8-18

8.29 SHOW ETHERNET-OAM LOOPBACK STATUS 8-19

Chapter 1 Commands for Network Port Configuration

1.1 Commands for Ethernet Port Configuration

1.1.1 bandwidth

Command: bandwidth control <*bandwidth*> {transmit | receive | both}

no bandwidth control

Function: Enable the bandwidth limit function on the port; the no command disables this function.

Parameter: <*bandwidth*> is the bandwidth limit, which is shown in kbps ranging between 1-1000000K; both refers to the bandwidth limit when the port receives and sends data, receive refers to the bandwidth **limit** will only performed when the switch receives data from out side, while **transmit** refers to the function will be perform on sending only.

Command Mode: Port Mode.

Default: Bandwidth limit disabled by default.

Usage Guide: When the bandwidth limit is enabled with a size set, the max bandwidth of the port is determined by this size other than by 10/100/1000M. If **[both | receive | transmit]** keyword is not specified, the default is **both**.

Note: The bandwidth limit can not exceed the physic maximum speed on the port. For example, an 10/100M Ethernet port can not be set to a bandwidth limit at 101000K (or higher), but applicable on a 10/100/1000 port working at a speed of 100M. If the actual bandwidth is not a integral multiple of chip bandwidth granularity, it will be modified automatically. For example, a chip bandwidth granularity is 64K, but the input bandwidth is 50, the bandwidth will be modified as 64.

Bandwidth control is similar to broadcast suppression. There is granularity limitation for the chip; the switch support 1M and 62.5K granularities. When setting the value to be integer multiple of 1M, the setting value is effective, other conditions get integer of 62.5K granularity.

Example: Set the bandwidth limit of 1/1-8 port is 40000K.

Switch(config)#interface ethernet 1/1-8

Switch(Config-If-Port-Range)#bandwidth control 40000 both

1.1.2 combo-forced-mode

Command: combo-forced-mode {copper-forced | copper-preferred-auto | sfp-forced | sfp-preferred-auto }

Function: Sets to combo port mode (combo ports only).

Parameters: copper-forced forces use of copper cable port; **copper-preferred-auto** for copper cable port first; sfp-forced forces use of fiber cable port; **sfp-preferred-auto** for fiber cable port first.

Command mode: Port Mode.

Default: The default setting for combo mode of combo ports is sfp-preferred-auto.

Usage Guide: The combo mode of combo ports and the port connection condition determines the active port of the combo ports. A combo port consists of one fiber port and a copper cable port. It should be noted that the speed-duplex command applies to the copper cable port while the negotiation command applies to the fiber cable port, they should not conflict. For combo ports, only one, a fiber cable port or a copper cable port, can be active at a time, and only this port can send and receive data normally. For the determination of the active port in a combo port, see the table below. The headline row in the table indicates the combo mode of the combo port, while the first column indicates the connection conditions of the combo port, in which

Note:

1. Combo port is a conception involving the physical layer and the LLC sublayer of the datalink layer. The status of a combo port will not affect any operation in the MAC sublayer of the datalink layer and upper layers. If the bandwidth limit for a combo port is 1Mbps, then this 1Mbps applies to the active port of this combo port, regardless of the port type being copper or fiber.

2. If a combo port connects to another combo port, it is recommended for both parties to use copper-forced or fiber-forced mode.

3. Run show interface under Admin Mode to check for the active port of a combo port .The following result indicates if the active port for a combo port is the fiber (or copper) cable port: Hardware is Gigabit-combo, active is fiber (or copper)

Example: Setting ports 1/21-24 to fiber-forced.

Switch(config)#interface ethernet 1/21-24

Switch(Config-Port-Range)#combo-forced-mode sfp-forced

1.1.3 clear counters interface

Command: clear counters interface [{ethernet *<interface-list>* | vlan *<vlan-id>* | port-channel *<port-channel-number>* | *<interface-name>*}]

Function: Clears the statistics of the specified port.

Parameters: *<interface-list>* stands for the Ethernet port number; ***<vlan-id>*** stands for the VLAN interface number; ***<port-channel-number>*** for trunk interface number;

<interface-name> for interface name, such as port-channel 1.

Command mode: Admin Mode.

Default: Port statistics are not cleared by default.

Usage Guide: If no port is specified, then statistics of all ports will be cleared.

Example: Clearing the statistics for Ethernet port1/1.

Switch#clear counters interface ethernet 1/1

1.1.4 flow control

Command: flow control

no flow control

Function: Enables the flow control function for the port: the "**no flow control"** command disables the flow control function for the port.

Command mode: Port Mode.

Default: Port flow control is disabled by default.

Usage Guide: After the flow control function is enabled, the port will notify the sending device to slow down the sending speed to prevent packet loss when traffic received exceeds the capacity of port cache. Ports support IEEE802.3X flow control; the ports work in half-duplex mode, supporting back-pressure flow control. If flow control results in serious HOL, the switch will automatically start HOL control (discarding some packets in the COS queue that may result in HOL) to prevent drastic degradation of network performance.

Note: Port flow control function is not recommended unless the users need a slow speed, low performance network with low packet loss. Flow control will not work between different cards in the switch. When enable the port flow control function, speed and duplex mode of both ends should be the same.

Example: Enabling the flow control function in ports 1/1-8.

Switch(config)#interface ethernet 1/1-8

Switch(Config-If-Port-Range)#flow control

1.1.5 interface ethernet

Command: interface ethernet <*interface-list*>

Function: Enters Ethernet Port Mode from Global Mode.

Parameters: <*interface-list*> stands for port number.

Command mode: Global Mode

Usage Guide: Run the **exit** command to exit the Ethernet Port Mode to Global Mode.

Example: Entering the Ethernet Port Mode for ports1/1, 1/4-5, 1/8.

Switch(config)#interface ethernet 1/1; 1/4-5; 1/8.

Switch(Config-If-Port-Range)#

1.1.6 loopback

Command: loopback

no loopback

Function: Enables the loopback test function in an Ethernet port; the no command disables the loopback test on an Ethernet port.

Command mode: Port Mode.

Default: Loopback test is disabled in Ethernet port by default.

Usage Guide: Loopback test can be used to verify the Ethernet ports are working normally. After loopback has been enabled, the port will assume a connection established to itself, and all traffic sent from the port will be received at the very same port.

Example: Enabling loopback test in Ethernet ports 1/1-8.

Switch(config)#interface ethernet 1/1-8

Switch(Config-If-Port-Range)#loopback

1.1.7 mdi

Command: mdi {auto | across | normal}

no mdi

Function: Sets the cable types supported by the Ethernet port; the no command sets the cable type to auto-identification. This command is not supported on combo ports and fiber ports.

Parameters: auto indicates auto identification of cable types; **across** indicates crossover cable support only; **normal** indicates straight-through cable support only.

Command mode: Port Mode.

Default: Port cable type is set to auto-identification by default.

Usage Guide: Auto-identification is recommended. Generally, straight-through cable is used for switch-PC connection and crossover cable is used for switch-switch connection.

Example: Setting the cable type support of Ethernet ports 1/1-8 to straight-through cable only.

Switch(config)#interface ethernet 1/1-8

Switch(Config-If-Port-Range)#mdi normal

1.1.8 name

Command: name <*string*>

no name

Function: Set name for specified port; the no command cancels this configuration.

Parameter: <*string*> is a character string, which should not exceeds 200 characters.

Command Mode: Port Mode.

Default: No port name by default.

Usage Guide: This command is for helping the user manage switches, such as the user assign names according to the port application, e.g. financial as the name of 1/1-2 ports which is used by financial department, engineering as the name of 1/9 ports which belongs to the engineering department, while the name of 1/12 ports is assigned with Server, which is because they connected to the server. In this way the port distribution state will be brought to the table.

Example: Specify the name of 1/1-2 port as financial.

Switch(config)#interface ethernet 1/1-2

Switch(Config-If-Port-Range)#name financial

1.1.9 negotiation

Command: negotiation {on | off}

Function: Enables/Disables the auto-negotiation function of a 1000Base-FX port.

Parameters: on: enables the auto-negotiation; off: disable the auto-negotiation.

Command mode: Port configuration Mode.

Default: Auto-negotiation is enabled by default.

Usage Guide: This command applies to 1000Base-FX interface only. The **negotiation** command is not available for 1000Base-TX or 100Base-TX interface. For combo port, this command applies to the 1000Base-FX port only but has no effect on the 1000Base-TX port. To change the negotiation mode, speed and duplex mode of 1000Base-TX port, use **speed-duplex** command instead.

Example: Port 21 of Switch1 is connected to port 21 of Switch2, the following will disable the negotiation for both ports.

Switch1(config)#interface ethernet1/21

Switch1(Config-If-Ethernet1/21)#negotiation off

Switch2(config)#interface ethernet1/21

Switch2(Config-If-Ethernet1/21)#negotiation off

1.1.10 port-rate-statistics interval

Command: port-rate-statistics interval [<interval-value>]

Function: Set the interval of port-rate-statistics, ranging from 5 to 600.

Parameter: interval-value: The interval of port-rate-statistics, unit is second, ranging from 5 to 600 with the configuration step of 5.

Default: Only port-rate-statistics of 5 seconds and 5 minutes are displayed.

Command Mode: Global Mode

Usage Guide: None.

Example: Count the interval of port-rate-statistics as 20 seconds.

Switch(config)#port-rate-statistics interval 20

1.1.11 port-scan-mode

Command: port-scan-mode {interrupt | poll}

no port-scan-mode

Function: Configure the scan mode of the port as “interrupt” or “poll”, the no command restores the default scan mode.

Parameter: interrupt: the interrupt mode; poll: the poll mode.

Command Mode: Global Mode.

Default: Poll mode.

Usage Guide: There are two modes that can respond up/down event of the port. The interrupt mode means that interrupt hardware to announce the up/down change, the poll mode means that software poll can obtain the port event, the first mode is rapid. If using poll mode, the convergence time of MRPP is several hundred milliseconds, if using interrupt mode, the convergence time is less than 50 milliseconds.

Notice: The scan mode of the port usually configured as poll mode, the interrupt mode is only used to the environment of the good performance, but the security of the poll mode is better.

Example: Configure the scan mode of the port as interrupt mode.

Switch(config)#port-scan-mode interrupt

1.1.12 port-status query interval

This command is not supported by the switch.

1.1.13 rate-suppression

Command: rate-suppression {dlf | broadcast | multicast} <Kbits>

no rate-suppression {dlf | broadcast | multicast}

Function: Sets the traffic limit for broadcasts, multicasts and unknown destination unicasts on all ports in the switch; the no command disables this traffic suppression function on all ports in the switch, i.e., enables broadcasts, multicasts and unknown destination unicasts to pass through the switch at line speed.

Parameters: use dlf to limit unicast traffic for unknown destination; multicast to limit

multicast traffic; broadcast to limit broadcast traffic. <Kbits> means the number of packets allowed to pass per second, the ranging from 1 to 1000000.

Command mode: Port Mode.

Default: No limit is set by default**.** So, broadcasts, multicasts and unknown destination unicasts are allowed to pass at line speed.

Usage Guide: All ports in the switch belong to a same broadcast domain if no VLAN has been set. The switch will send the above mentioned three traffics to all ports in the broadcast domain, which may result in broadcast storm and so may greatly degrade the switch performance. Enabling Broadcast Storm Control can better protect the switch from broadcast storm. Note the difference of this command in 10Gb ports and other ports. If the allowed traffic is set to 1000kbps, this means allow 1000 kbit per second and suppress the rest.

Broadcast suppression is similar to bandwidth control. There is granularity limitation for the chip; the switch support 1M and 62.5K granularities. When setting the value to be integer multiple of 1M, the setting value is effective, other conditions get integer of 62.5K granularity

For broadcast suppression, broadcast, multicast, dlf must be set the same threshold value.

Example: Setting ports 1-8 allow 1000kbit broadcast packets per second.

Switch(config-if-port-range)#rate-suppression broadcast 1000

1.1.14 rate-violation

Command: rate-violation <200-2000000> [recovery <0-86400>[]

no rate-violation

Function: Set the max packet reception rate of a port. If the rate of the received packet violates the packet reception rate, shut down this port and configure the recovery time, the default is 300s. The no command will disable the rate-violation function of a port.

The rate-violation means the port received all packets rate (the number of the received packets per second), do not distinguish the packet type.

Parameters: <200-2000000> the max packet reception rate of a port, the unit is packets/s.

<0-86400>: The interval of recovery after shutdown, the unit is s.

recovery: After a period of time the port can recover shutdown to up again. <0-86400> is the timeout of recovery. For example, if the shutdown of a port happens after the packet reception rate exceeding the limit, the port will be up again when the user-defined timeout expires. The default timeout is 300s, while 0 means the recovery will never happen.

Command Mode: Interface Mode

Default: There is no control operation for rate-violation.

Usage Guide: This command is mainly used to detect the abnormal port flow. For example, when there are a large number of broadcast messages caused by a loopback, which affect the processing of other tasks, the port will be shut down to ensure the normal processing of the switch.

Example: Set the rate-violation of port 8-10 (GB ports) of the switch as 10000pps and the port recovery time as 1200 seconds.

Switch(config)#interface ethernet 1/8-10

Switch(Config-Port-Range)#rate-violation 10000 recovery 1200

1.1.15 rate-violation control

This command is not supported by the switch**.**

1.1.16 remote-statistics interval

This command is not supported by the switch.

1.1.17 show interface

Command: show interface [ethernet *<interface-number>* | port-channel *<port-channel-number>* | vlan *<vlan-id>* | *<interface-name>*] [detail]

show interface ethernet status

show interface ethernet counter {packet | rate}

Function: Show information of layer 3 or layer 2 port on the switch

Parameter: *<vlan-id>* is the VLAN interface number, the value range from 1 to 4094. ***<interface-number>*** is the port number of the Ethernet, **status** show important information of all the layer 2 ports. **counter {packet | rate}** show package number or rate statistics of all layer 2 ports. ***<port-channel-number>*** is the number of the aggregation interface, ***<interface-name>*** is the name of the interface such as port-channel1. **[detail]** show the detail of the port.

Command Mode: Admin and Configuration Mode.

Default: Information not displayed by default

Usage Guide: While for vlan interfaces, the port MAC address, IP address and the statistic state of the data packet will be shown; As for Ethernet port, this command will show port speed rate, duplex mode, flow control switch state, broadcast storm suppression of the port and the statistic state of the data packets; for aggregated port, port speed rate, duplex mode, flow control switch state, broadcast storm suppression of the port and the statistic state of the data packets will be displayed. The information of all ports

on the switch will be shown if no port is specified.

Using [detail] to show the detail information for ethernet port and port-channel port, the information is related with the type of switch, board card.

For ethernet port, using status to show important information of all the layer 2 ports by list format. each port is a row, the showing information include port number, Link, Protocl status, Speed, Duplex, Vlan, port type and port name; counter packets show package number statistics of all ethernet ports, include layer 2 unicast, broadcast, multicast, error of input and output redirection package number; counter rate show the rate statistics of all ethernet ports, input and output package number, byte number in 5 minutes and 5 seconds.

Example: Show the information of VLAN 1

```
Switch#show interface vlan 1
Vlan1 is up, line protocol is up, dev index is 2005
Device flag 0x1003(UP BROADCAST MULTICAST)
IPv4 address is:
192.168.10.1        255.255.255.0        (Primary)
Hardware is EtherSVI, address is 00-00-00-00-00-01
MTU is 1500 bytes , BW is 0 Kbit
Encapsulation ARPA, loopback not set
5 minute input rate 0 bytes/sec, 0 packets/sec
5 minute output rate 0 bytes/sec, 0 packets/sec
The last 5 second input rate 0 bytes/sec, 0 packets/sec
The last 5 second output rate 0 bytes/sec, 0 packets/sec
Input packets statistics:
Input queue 0/600, 0 drops
0 packets input, 0 bytes, 0 no buffer
0 input errors, 0 CRC, 0 frame alignment, 0 overrun
0 ignored, 0 abort, 0 length error
Output packets statistics:
0 packets output, 0 bytes, 0 underruns
  0 output errors, 0 collisions, 0 late collisions
```

Show the information of port 1/1:

```
Switch#show interface e1/1
Ethernet1/1 is up, line protocol is down
Ethernet1/1 is layer 2 port, alias name is (null), index is 1
Hardware is Gigabit-TX, address is 00-03-0f-02-fc-01
PVID is 1
```

MTU 1500 bytes, BW 10000 Kbit
Encapsulation ARPA, Loopback not set
Auto-duplex: Negotiation half-duplex, Auto-speed: Negotiation 10M bits
FlowControl is off, MDI type is auto
5 minute input rate 0 bytes/sec, 0 packets/sec
5 minute output rate 0 bytes/sec, 0 packets/sec
The last 5 second input rate 0 bytes/sec, 0 packets/sec
The last 5 second output rate 0 bytes/sec, 0 packets/sec
Input packets statistics:
0 input packets, 0 bytes, 0 no buffer
0 unicast packets, 0 multicast packets, 0 broadcast packets
0 input errors, 0 CRC, 0 frame alignment, 0 overrun, 0 ignored
0 abort, 0 length error, 0 pause frame
Output packets statistics:
0 output packets, 0 bytes, 0 underruns
0 unicast packets, 0 multicast packets, 0 broadcast packets
0 output errors, 0 collisions, 0 late collisions, 0 pause frame

Show the important information of all layer 2 ports:
Switch#show interface ethernet status
Codes: A-Down - administratively down, a - auto, f - force, G - Gigabit

Interface	Link/Protocol	Speed	Duplex	Vlan	Type	Alias Name
1/1	UP/UP	f-100M	f-full	1	G-TX	
1/2	UP/UP	a-100M	a-full	trunk	G-TX	
1/3	UP/DOWN	auto	auto	1	G-TX	
1/4	A-Down/DOWN	auto	auto	1	G-TX	

…

Show the package number statistics information of all layer 2 ports:
Switch#Show interface ethernet counter packet

Interface		Unicast(pkts)	BroadCast(pkts)	MultiCast(pkts)	Err(pkts)
1/1	IN	12,345,678	12,345,678,9	12,345,678,9	4,567
	OUT	23,456,789	34,567,890	5,678	0
1/2	IN	0	0	0	0
	OUT	0	0	0	0
1/3	IN	0	0	0	0
	OUT	0	0	0	0

1/4	IN	0	0	0	0
	OUT	0	0	0	0

…

Show the rate statistics information of all layer 2 ports:

Switch#Show interface ethernet counter rate

Interface		IN(pkts/s)	IN(bytes/s)	OUT(pkts/s)	OUT(bytes/s)
1/1	5m	13,473	12,345,678	12,345	1,234,567
	5s	135	65,800	245	92,600
1/2	5m	0	0	0	0
	5s	0	0	0	0
1/3	5m	0	0	0	0
	5s	0	0	0	0
1/4	5m	0	0	0	0
	5s	0	0	0	0

…

1.1.18 shutdown

Command: shutdown

no shutdown

Function: Shuts down the specified Ethernet port; the no command opens the port.

Command mode: Port Mode.

Default: Ethernet port is open by default.

Usage Guide: When Ethernet port is shut down, no data frames are sent in the port, and the port status displayed when the user types the "**show interface**" command is "down".

Example: Opening ports 1/1-8.

Switch(config)#interface ethernet1/1-8

Switch(Config-If-Port-Range)#no shutdown

1.1.19 speed-duplex

Command: speed-duplex {auto [10 [100 [1000]] [auto | full | half |]] | force10-half | force10-full | force100-half | force100-full | force100-fx [module-type {auto-detected | no-phy-integrated | phy-integrated}] | {{force1g-half | force1g-full} [nonegotiate [master | slave]]}| force10g-full}

no speed-duplex

Function: Sets the speed and duplex mode for 1000Base-TX, 100Base-TX or 100Base-FX ports; the no command restores the default speed and duplex mode setting,

i.e., auto speed negotiation and duplex.

Parameters: auto is the auto speed and duplex negotiation, **10** is 10Mbps speed, **100** is 100Mbps speed, **1000** is 1000Mbps speed, **auto** is duplex negotiation, **full** is full-duplex, **half** is half-duplex; **force10-half** is the forced 10Mbps at half-duplex mode; **force10-full** is the forced 10Mbps at full-duplex mode; **force100-half** is the forced 100Mbps at half-duplex mode; **force100-full** is the forced 100Mbps at full-duplex mode; **force100-fx** is the forced 100Mbps at full-duplex mode; **module-type** is the type of 100Base-FX module; **auto-detected:** automatic detection; **no-phy-integrated:** there is no phy-integratd 100Base-FX module; **phy-integrated:** phy-integratd 100Base-FX module; **force1g-half** is the forced 1000Mbps speed at half-duplex mode; **force1g-full** is the forced 1000Mbps speed at full-duplex mode; **nonegotiate** disables auto-negotiation forcibly for 1000Mb port; **master** forces the 1000Mb port to be **master** mode; **slave** forces the 1000Mb port to be **slave** mode. **force10g-full** is the forced 10000Mbps speed at full-duplex mode.

Command mode: Port Mode.

Default: Auto-negotiation for speed and duplex mode is set by default.

Usage Guide: This command is configures the port speed and duplex mode. When configuring port speed and duplex mode, the speed and duplex mode must be the same as the setting of the remote end, i.e., if the remote device is set to auto-negotiation, then auto-negotiation should be set at the local port. If the remote end is in forced mode, the same should be set in the local end.

1000Gb ports are by default **master** when configuring **nonegotiate** mode. If one end is set to **master** mode, the other end must be set to **slave** mode.

force1g-half is not supported yet.

Example: Port 1 of Switch1 is connected to port 1 of Switch2, the following will set both ports in forced 100Mbps at half-duplex mode.

Switch1(config)#interface ethernet1/1

Switch1(Config-If-Ethernet1/1)#speed-duplex force100-half

Switch2(config)#interface ethernet1/1

Switch2(Config-If-Ethernet1/1)#speed-duplex force100-half

1.1.20 virtual-cable-test

Command: virtual-cable-test

Function: Test the link of the twisted pair cable connected to the Ethernet port. The response may include: well, short, open, fail. If the test information is not well, the location of the error will be displayed (how many meters it is away from the port).

Command Mode: Port Configuration Mode.

Default Settings: No link test.

Usage Guide: The RJ-45 port connected with the twisted pair under test should be in accordance with the wiring sequence rules of IEEE802.3, or the wire pairs in the test result may not be the actual ones. On a 100M port, only two pairs are used: (1, 2) and (3, 6), whose results are the only effective ones. If a 1000M port is connected to a 100M port, the results of (4, 5) and (7, 8) will be of no meaning. The result may have deviations according to the type of the twisted pair, the temperature, working voltage and other conditions. When the temperature is 20 degree Celsius, and the voltage is stable without interference, and the length of the twisted pair is no longer than 100 meters, a deviation of +/- 5 meters is allowed.

568A wiring sequence: (1 green white, 2 green), (3 orange white, 6 orange), (4 blue, 5 blue white), (7 brown white, 8 brown).

568B wiring sequence: (1 orange white, 2 orange), (3 green white, 6 green), (4 blue, 5 blue white), (7 brown white, 8 brown).

Example: Test the link status of the twisted pair connected to the 1000M port 1/25.

```
Switch(config)#interface ethernet 1/25
Switch(Config-If-Ethernet1/25)#virtual-cable-test
Interface Ethernet1/25:
------------------------------------------------------------------------
Cable pairs       Cable status      Error length (meters)
---------------   -----------------  -------------------------
(1, 2)            open              5
(3, 6)            open              5
(4, 5)            open              5
(7, 8)            short             5
```

Chapter 2 Commands for Port Isolation Function

2.1 isolate-port group

Command: isolate-port group <*WORD*>

no isolate-port group <*WORD*>

Function: Set a port isolation group, which is the scope of isolating ports; the no operation of this command will delete a port isolation group and remove all ports out of it.

Parameters: <*WORD*> is the name identification of the group, no longer than 32 characters.

Command Mode: Global Mode.

Default: None.

Usage Guide: Users can create different port isolation groups based on their requirements. For example, if a user wants to isolate all downlink ports in a vlan of a switch, he can implement that by creating a port isolation group and adding all downlink ports of the vlan into it. No more than 16 port isolation groups can a switch have. When the users need to change or redo the configuration of the port isolation group, he can delete the existing group with the no operation of this command.

Example: Create a port isolation group and name it as ”test”.

Switch>enable

Switch#config

Switch(config)#isolate-port group test

2.2 isolate-port group switchport interface

Command: isolate-port group <*WORD*> switchport interface [ethernet] <*IFNAME*>

no isolate-port group <*WORD*> switchport interface [ethernet] <*IFNAME*>

Function: Add one port or a group of ports into a port isolation group to isolate, which will become isolated from the other ports in the group. The no operation of this command will remove one port or a group of ports out of a port isolation group, which will be able to communicate will ports in that group normally. If the ports removed from the group still belong to another port isolation group, they will remain isolated from the ports in that group. If an Ethernet port is a member of a convergence group, it should not be added into

a port isolation group, and vice versa, a member of a port isolation group should not be added into an aggregation group. But one port can be a member of one or more port isolation groups.

Parameters: ***<WORD>*** is the name identification of the group, no longer than 32 characters. If there is no such group with the specified name, create one; **ethernet** means that the ports to be isolated is Ethernet ones, followed by a list of Ethernet ports, supporting symbols like ";" and "-". For example: "ethernet 1/1;3;4-7;8"; ***<IFNAME>*** is the name of the interface, such as e1/1. If users use interface name, the parameter of ethernet will not be required.

Command Mode: Global Mode.

Default: None.

Usage Guide: Users can add Ethernet ports into or remove them from a port isolation group according to their requirements. When an Ethernet port is a member of more than one port isolate group, it will be isolated from every port of all groups it belongs to.

Example: Add Ethernet ports 1/1-2 and 1/5 into a port isolation group named as "test".

Switch(config)#isolate-port group test switchport interface ethernet 1/1-2; 1/5

2.3 isolate-port apply

This command is not supported by the switch.

2.4 show isolate-port group

Command: show isolate-port group [<*WORD*>]

Function: Display the configuration of port isolation, including all configured port isolation groups and Ethernet ports in each group.

Parameters: <*WORD*> the name identification of the group, no longer than 32 characters; no parameter means to display the configuration of all port isolation groups.

Command Mode: Admin Mode and Global Mode.

Default: Display the configuration of all port isolation groups.

Usage Guide: Users can view the configuration of port isolation with this command.

Example: Display the port isolation configuration of the port isolation group named as "test".

Switch(config)#show isolate-port group test

Isolate-port group test

The isolate-port Ethernet1/5

The isolate-port Ethernet1/2

Chapter 3 Commands for Port Loopback Detection Function

3.1 debug loopback-detection

Command: debug loopback-detection

Function: After enabling the loopback detection debug on a port, BEBUG information will be generated when sending, receiving messages and changing states.

Parameters: None.

Command Mode: Admin Mode.

Default: Disabled by default.

Usage Guide: Display the message sending, receiving and state changes with this command.

Example:

Switch#debug loopback-detection

%Jan 01 03:29:18 2006 Send loopback detection probe packet:dev Ethernet1/10, vlan id 1

%Jan 01 03:29:18 2006 Send loopback detection probe packet:dev Ethernet 1/10, vlan id 2

3.2 loopback-detection control

Command: loopback-detection control {shutdown |block| learning}

no loopback-detection control

Function: Enable the function of loopback detection control on a port, the no operation of this command will disable the function.

Parameters: shutdown set the control method as shutdown, which means to close down the port if a port loopback is found.

block set the control method as block, which means to block a port by allowing bpdu and loopback detection messages only if a port loopback is found.

learning disable the control method of learning MAC addresses on the port, not forwarding traffic and delete the MAC address of the port.

Default: Disable the function of loopback diction control.

Command Mode: Port Mode.

Usage Guide: If there is any loopback, the port will not recovery the state of be controlled after enabling control operation on the port. If the overtime is configured, the ports will recovery normal state when the overtime is time-out. If the control method is block, the corresponding relationship between instance and vlan id should be set manually by users, it should be noticed when be used.

Example: Enable the function of loopback detection control under port1/2 mode.

Switch(config)#interface ethernet 1/2

Switch(Config-If-Ethernet1/2)#loopback-detection control shutdown

Switch(Config-If-Ethernet1/2)#no loopback-detection control

3.3 loopback-detection control-recovery timeout

Command: loopback-detection control-recovery timeout <0-3600>

Function: This command is used to recovery to uncontrolled state after a special time when a loopback being detected by the port entry be controlled state.

Parameters: <0-3600> second is recovery time for be controlled state, 0 is not recovery state.

Default: The recovery is not automatic by default.

Command Mode: Global Configuration Mode.

Usage Guide: When a port detects a loopback and works in control mode, the ports always work in control mode and not recover. The port will not sent packet to detection in shutdown mode, however, the port will sent loopback-detection packet to detection whether have loopback in block or learning mode. If the recovery time is configured, the ports will recovery normal state when the overtime is time-out. The recovery time is a useful time for shutdown control mode, because the port can keep on detection loopback in the other modes, so suggest not to use this command.

Examples: Enable automatic recovery of the loopback-detection control mode after 30s.

Switch(config)#loopback-detection control-recovery timeout 30

3.4 loopback-detection interval-time

Command: loopback-detection interval-time <*loopback*> <*no-loopback*>

no loopback-detection interval-time

Function: Set the loopback detection interval. The no operate closes the loopback detection interval function.

Parameters: <*loopback* > the detection interval if any loopback is found, ranging from 5 to 300, in seconds.

<no-loopback > the detection interval if no loopback is found, ranging from 1 to 30, in seconds.

Default: The default value is 5s with loopbacks existing and 3s otherwise.

Command Mode: Global Mode.

Usage Guide: When there is no loopback detection, the detection interval can be relatively shorter, for too short a time would be a disaster for the whole network if there is any loopback. So, a relatively longer interval is recommended when loopbacks exist.

Example: Set the loopback diction interval as 35, 15.

Switch(config)#loopback-detection interval-time 35 15

3.5 loopback-detection specified-vlan

Command: loopback-detection specified-vlan <*vlan-list*>

no loopback-detection specified-vlan [<*vlan-list*>]

Function: Enable the function of loopback detection on the port and specify the VLAN to be checked; the no operation of this command will disable the function of detecting loopbacks through this port or the specified VLAN.

Parameters: <*vlan-list*> the list of VLANs allowed passing through the port. Given the situation of a trunk port, the specified VLANs can be checked. So this command is used to set the vlan list to be checked.

Default: Disable the function of detecting the loopbacks through the port.

Command Mode: Port Mode.

Usage Guide: If a port can be a TRUNK port of multiple Vlans, the detection of loopbacks can be implemented on the basis of port+Vlan, which means the objects of the detection can be the specified Vlans on a port. If the port is an ACCESS port, only one Vlan on the port is allowed to be checked despite the fact that multiple Vlans can be configured. This function is not supported under Port-channel.

Example: Enable the function of loopback detection under port 1/2 mode.

Switch(config)#interface ethernet 1/2

Switch(Config-If-Ethernet1/2)#switchport mode trunk

Switch(Config-If-Ethernet1/2)#switchport trunk allowed vlan all

Switch(Config-If-Ethernet1/2)#loopback-detection specified-vlan 1;3;5-20

Switch(Config-If-Ethernet1/2)#no loopback-detection specified-vlan 1;3;5-20

3.6 show loopback-detection

Command: show loopback-detection [interface <*interface-list*>]

Function: Display the state of loopback detection on all ports if no parameter is provided, or the state and result of the specified ports according to the parameters.

Parameters: ***<interface-list>*** the list of ports to be displayed, for example: ethernet 1/1.

Command Mode: Admin and Configuration Mode.

Usage Guide: Display the state and result of loopback detection on ports with this command.

Example: Display the state of loopback detection on port 4.

```
Switch(config)#show loopback-detection interface Ethernet 1/4
loopback detection config and state information in the switch!
PortName          Loopback Detection      Control Mode    Is Controlled
Ethernet1/4       Enable                  Shutdown        No
```

Chapter 4 Commands for ULDP

4.1 debug uldp

Command: debug uldp (hello | probe | echo | unidir | all) [receive | send] interface [ethernet] IFNAME

no debug uldp (hello | probe | echo | unidir | all) [receive | send] interface [ethernet] IFNAME

Function: Enable the debugging for receiving and sending the specified packets or all ULDP packets on port. After enable the debugging, show the information of the received and sent packets in terminal. The no command disables the debugging.

Parameters: hello: packet's type is hello, it's announcement packet, including common announcement packet, RSY and Flush packet

probe: packet's type is probe, it's detection packet

echo: packet's type is echo, it means response of detection packet

unidir: packet's type is unidir, it's announcement packet that discover the single link

all: All ULDP packets

Command mode: Admin mode

Default: Disable.

Usage Guide: With this command, user can check probe packets received by port 1/2.

Switch#debug uldp probe receive interface ethernet 1/2

4.2 debug uldp error

Command: debug uldp error

no debug uldp error

Function: Enable the error message debug function, the no form command disable the function.

Parameter: None.

Command Mode: Admin Mode.

Default: Disabled.

Usage Guide: Use this command to display the error message.

Example: Display the error message.

Switch#debug uldp error

4.3 debug uldp event

Command: debug uldp event

no debug uldp event

Function: Enable the message debug function to display the event; the no form command disables this function.

Parameter: None.

Command Mode: Admin Mode.

Default: Disabled.

Usage Guide: Use this command to display all kinds of event information.

Example: Display event information.

Switch#debug uldp event

4.4 debug uldp fsm interface ethernet

Command: debug uldp fsm interface ethernet *<IFname>*

no debug uldp fsm interface ethernet *<IFname>*

Function: To enable debugging information for ULDP for the specified interface. The no form of this command will disable the debugging information.

Parameters: *<IFname>* is the interface name.

Command Mode: Admin Configuration Mode.

Default: Disabled by default.

Usage Guide: This command can be used to display the information about state transitions of the specified interfaces.

Example: Print the information about state transitions of interface ethernet 1/1.

Switch#debug uldp fsm interface ethernet 1/1

4.5 debug uldp interface ethernet

Command: debug uldp {hello|probe|echo|unidir|all} [receive|send] interface ethernet *<IFname>*

no debug uldp {hello|probe|echo|unidir|all} [receive|send] interface ethernet *<IFname>*

Function: Enable the debug function of display the packet details. After that, display some kinds of the packet details of terminal interface.

Parameter: *<IFname>*: Name of the interface.

Command Mode: Admin Mode.

Default: Disabled.

Usage Guide: Use this command to display the Hello packet details receiving on the interface Ethernet 1/1.

Switch#debug uldp hello receive interface Ethernet 1/1

4.6 debug uldp packet

Command: debug uldp packet [receive|send]

no debug uldp packet [receive|send]

Function: Enable receives and sends packet debug function, after that. Display the type and interface of the packet which receiving and sending on the client. The no form command disables this function.

Parameter: None.

Command Mode: Admin Mode.

Default: Disabled.

Usage Guide: Use this command to display the packet that receiving on each interface.

Switch#debug uldp packet receive

4.7 uldp aggressive-mode

Command: uldp aggressive-mode

no uldp aggressive-mode

Function: To configure ULDP to work in aggressive mode. The no form of this command will restore the normal mode.

Parameters: None.

Command Mode: Global Configuration Mode and Port Configuration Mode.

Default: Normal mode.

Usage Guide: The ULDP working mode can be configured only if it is enabled globally. When ULDP aggressive mode is enabled globally, all the existing fiber ports will work in aggressive mode. For the copper ports and fiber ports which are available after the configuration is available, aggressive mode should be enabled in port configuration mode.

Example: To enable ULDP aggressive mode globally.

Switch(config)#uldp aggressive-mode

4.8 uldp enable

Command: uldp enable

Function: ULDP will be enabled after issuing this command. In global configuration mode, this command will enable ULDP for the global. In port configuration mode, this command will enable ULDP for the port.

Parameters: None.

Command Mode: Global Configuration Mode and Port Configuration Mode.

Default: By default ULDP is not configured.

Usage Guide: ULDP can be configured for the ports only if ULDP is enabled globally. If ULDP is enabled globally, it will be effect for all the existing fiber ports. For copper ports and fiber ports which are available after ULDP is enabled, this command should be issued in the port configuration mode to make ULDP be effect.

Example: Enable ULDP in global configuration mode.

Switch(config)#uldp enable

4.9 uldp disable

Command: uldp disable

Function: To disable ULDP configuration through this command.

Parameters: None.

Command Mode: Global Configuration Mode and Port Configuration Mode.

Default: By default ULDP is not configured.

Usage Guide: When ULDP is disabled globally, then ULDP in all the ports will be disabled.

Example: To disable the ULDP configuration in global configuration mode.

Switch(config)#uldp disable

4.10 uldp hello-interval

Command: uldp hello-interval *<integer>*

no uldp hello-interval

Function: To configure the interval for ULDP to send hello messages. The no form of this command will restore the default interval for the hello messages.

Parameters: *<integer>*: The interval for the Hello messages, with its value limited between 5 and 100 seconds, 10 seconds by default.

Command Mode: Global Configuration Mode.

Default: 10 seconds by default.

Usage Guide: Interval for hello messages can be configured only if ULDP is enabled globally, its value limited between 5 and 100 seconds.

Example: To configure the interval of Hello messages to be 12 seconds.

Switch(config)#uldp hello-interval 12

4.11 uldp manual-shutdown

Command: uldp manual-shutdown

no uldp manual-shutdown

Function: To configure ULDP to work in manual shutdown mode. The no command will restore the automatic mode.

Parameters: None.

Command Mode: Global Configuration Mode.

Default: Auto mode.

Usage Guide: This command can be issued only if ULDP has been enabled globally.

Example: To enable manual shutdown globally.

Switch(config)#uldp manual-shutdown

4.12 uldp recovery-time

Command: uldp recovery-time<*integer*>

no uldp recovery-time

Function: To configure the interval for ULDP recovery timer. The no form of this command will restore the default configuration.

Parameters: <*integer*>: the time out value for the ULDP recovery timer. Its value is limited between 30 and 86400 seconds.

Command Mode: Global Configuration Mode.

Default: 0 is set by default which means the recovery is disabled.

Usage Guide: If an interface is shutdown by ULDP, and the recovery timer times out, the interface will be reset automatically. If the recovery timer is set to 0, the interface will not be reset.

Example: To set the recovery timer to be 600 seconds.

Switch(config)#uldp recovery-time 600

4.13 uldp reset

Command: uldp reset

Function: To reset the port when ULDP is shutdown.

Parameters: None.

Command Mode: Globally Configuration Mode and Port Configuration Mode.

Default: None.

Usage Guide: This command can only be effect only if the specified interface is disabled by ULDP.

Example: To reset all the port which are disabled by ULDP.

Switch(config)#uldp reset

4.14 show uldp

Command: show uldp [interface ethernet<*interface-name*>]

Function: To show the global ULDP configuration and status information of interface. If <interface-name> is specified, ULDP configuration and status about the specified interface as well as its neighbors' will be displayed.

Parameters: <*interface-name*> is the interface name.

Command Mode: Admin and Configuration Mode.

Default: None.

Usage Guide: If no parameters are appended, the global ULDP information will be displayed. If the interface name is specified, information about the interface and its neighbors will be displayed along with the global information.

Example: To display the global ULDP information.

Switch(config)#show uldp

Chapter 5 Commands for LLDP Function

5.1 clear lldp remote-table

Command: clear lldp remote-table

Function: Clear the Remote-table on the port.

Parameters: None.

Default: Do not clear the entries.

Command Mode: Port Configuration Mode.

Usage Guide: Clear the Remote table entries on this port.

Example: Clear the Remote table entries on this port.

Switch(Config-If-Ethernet 1/1)# clear lldp remote-table

5.2 debug lldp

Command: debug lldp

no debug lldp

Function: Enable the debug information of LLDP function, the no operation of this command will disable the debug information of LLDP function.

Parameters: None.

Default: Disable the debug information of LLDP function.

Command Mode: Admin Mode.

Usage Guide: When the debug switch is enabled, users can check the receiving and sending of packets and other information.

Example: Enable the debug switch of LLDP function on the switch.

Switch#debug lldp

5.3 debug lldp packets

Command: debug lldp packets interface ethernet *<IFNAME>*

no debug lldp packets interface ethernet *<IFNAME>*

Function: Display the message-receiving and message-sending information of LLDP on the port; the no operation of this command will disable the debug information switch.

Parameters: None.

Default: Disable the debug information on the port.

Command Mode: Admin Mode.

Usage Guide: When the debug switch is enabled, users can check the receiving and sending of packets and other information on the port.

Example: Enable the debug switch of LLDP function on the switch.

Switch#debug lldp packets interface ethernet 1/1

%Jan 01 00:02:40 2006 LLDP-PDU-TX PORT= ethernet 1/1

5.4 lldp enable

Command: lldp enable

lldp disable

Function: Globally enable LLDP function; **disable** command globally disables LLDP function.

Parameters: None.

Default: Disable LLDP function.

Command Mode: Global Mode.

Usage Guide: If LLDP function is globally enabled, it will be enabled on every port.

Example: Enable LLDP function on the switch.

Switch(config)#lldp enable

5.5 lldp enable (Port)

Command: lldp enable

lldp disable

Function: Enable the LLDP function module of ports in port configuration mode; **disable** command will disable the LLDP function module of port.

Parameters: None.

Default: the LLDP function module of ports is enabled by default in port configuration mode.

Command Mode: Port Configuration Mode.

Usage Guide: When LLDP is globally enabled, it will be enabled on every port, the switch on a port is used to disable this function when it is unnecessary on the port.

Example: Disable LLDP function of port on the port ethernet 1/5 of the switch.

Switch(config)#in ethernet 1/5

Switch(Config-If-Ethernet 1/5)#lldp disable

5.6 lldp mode

Command: lldp mode <*send* | *receive* | *both* | *disable*>

Function: Configure the operating state of LLDP function of the port.

Parameters: send: Configure the LLDP function as only being able to send messages.

receive: Configure the LLDP function as only being able to receive messages.

both: Configure the LLDP function as being able to both send and receive messages.

disable: Configure the LLDP function as not being able to send or receive messages.

Default: The operating state of the port is “both”.

Command Mode: Port Configuration Mode.

Usage Guide: Choose the operating state of the lldp Agent on the port.

Example: Configure the state of port ethernet 1/5 of the switch as “receive”.

Switch(config)#in ethernet 1/5

Switch(Config-If-Ethernet 1/5)#lldp mode receive

5.7 lldp msgTxHold

Command: lldp msgTxHold <*value*>

no lldp msgTxHold

Function: Set the multiplier value of the aging time carried by update messages sent by the all ports with LLDP function enabled, the value ranges from 2 to 10.

Parameters: <*value*> is the aging time multiplier, ranging from 2 to 10.

Default: the value of the multiplier is 4 by default.

Command Mode: Global Mode.

Usage Guide: After configuring the multiplier, the aging time is defined as the product of the multiplier and the interval of sending messages, and its maximum value is 65535 seconds.

Example: Set the value of the aging time multiplier as 6.

Switch(config)#lldp msgTxHold 6

5.8 lldp neighbors max-num

Command: lldp neighbors max-num <*value*>

no lldp neighbors max-num

Function: Set the maximum number of entries can be stored in Remote MIB.

Parameters: <*value*> is the configured number of entries, ranging from 5 to 500.

Default: The maximum number of entries can be stored in Remote MIB is 100.

Command Mode: Port Configuration Mode.

Usage Guide: The maximum number of entries can be stored in Remote MIB.

Example: Set the Remote as 200 on port ethernet 1/5 of the switch.

Switch(config)#in ethernet 1/5

Switch(Config-If-Ethernet 1/5)# lldp neighbors max-num 200

5.9 lldp notification interval

Command: lldp notification interval <*seconds*>

no lldp notification interval

Function: When the time interval ends, the system is set to check whether the Remote Table has been changed. If it has, the system will send Trap to the SNMP management end.

Parameters: <*seconds*>is the time interval, ranging from 5 to 3600 seconds.

Default: The time interval is 5 seconds.

Command Mode: Global Mode.

Usage Guide: After configuring the notification time interval, a “trap” message will be sent at the end of this time interval whenever the Remote Table changes.

Example: Set the time interval of sending Trap messages as 20 seconds.

Switch(config)#lldp notification interval 20

5.10 lldp tooManyNeighbors

Command: lldp tooManyNeighbors {discard | delete}

Function: Set which operation will be done when the Remote Table is full.

Parameters: discard: discard the current message.

delete: Delete the message with the least TTL in the Remoter Table.

Default: Discard.

Command Mode: Port Configuration Mode.

Usage Guide: When the Remote MIB is full, Discard means to discard the received message; Delete means to the message with the least TTL in the Remoter Table.

Example: Set port ethernet 1/5 of the switch as delete.

Switch(config)#in ethernet 1/5

Switch(Config-If-Ethernet 1/5)#lldp tooManyNeighbors delete

5.11 lldp transmit delay

Command: lldp transmit delay <*seconds*>

no lldp transmit delay

Function: Since local information might change frequently because of the variability of the network environment, there could be many update messages sent in a short time. So a delay is required to guarantee an accurate statistics of local information.

When transmit delay is the default value and tx-interval is configured via some commands, transmit delay will become one fourth of the latter, instead of the default 2.

Parameters: <*seconds*>is the time interval, ranging from 1 to 8192 seconds.

Default: The interval is 2 seconds by default.

Command Mode: Global Mode.

Usage Guide: When the messages are being sent continuously, a sending delay is set to prevent the Remote information from being updated repeatedly due to sending messages simultaneously.

Example: Set the delay of sending messages as 3 seconds.

Switch(config)#lldp transmit delay 3

5.12 lldp transmit optional tlv

Command: lldp transmit optional tlv [portDesc] [sysName] [sysDesc] [sysCap]

no lldp transmit optional tlv

Function: Configure the type of optional TLV of the port.

Parameters: portDesc: the description of the port; **sysName:** the system name; **sysDesc:** The description of the system; **sysCap:** the capability of the system.

Default: The messages carry no optional TLV by default.

Command Mode: Port Configuration Mode.

Usage Guide: When configuring the optional TLV, each TLV can only appear once in a message, **portDesc** optional TLV represents the name of local port; **sysName** optional TLV represents the name of local system; **sysDesc** optional TLV represents the description of local system; **sysCap** optional TLV represents the capability of local system.

Example: Configure that port ethernet 1/5 of the switch carries portDesc and sysCap TLV.

Switch(config)#in ethernet 1/5

Switch(Config-If-Ethernet 1/5)# lldp transmit optional tlv portDesc sysCap

5.13 lldp trap

Command: lldp trap <*enable* | *disable*>

Function: enable: configure to enable the Trap function on the specified port; **disable:** configure to disable the Trap function on the specified port.

Parameters: None.

Default: The Trap function is disabled on the specified port by default.

Command Mode: Port Configuration Mode.

Usage Guide: The function of sending Trap messages is enabled on the port.

Example: Enable the Trap function on port ethernet 1/5 of the switch.

Switch(config)#in ethernet 1/5

Switch(Config-If-Ethernet 1/5)#lldp trap enable

5.14 lldp tx-interval

Command: lldp tx-interval <*integer*>

no lldp tx-interval

Function: Set the interval of sending update messages on all the ports with LLDP function enabled, the value of which ranges from 5 to 32768 seconds and is 30 seconds by default.

Parameters: <*integer*> is the interval of sending updating messages, ranging from 5 to 32768 seconds.

Default: 30 seconds.

Command Settings: Global Mode.

Usage Guide: After configuring the interval of sending messages, LLDP messages can only be received after a period as long as configured. The interval should be less than or equal with half of aging time, for a too long interval will cause the state of being aged and reconstruction happen too often; while a too short interval will increase the flow of the network and decrease the bandwidth of the port. The value of the aging time of messages is the product of the multiplier and the interval of sending messages. The maximum aging time is 65535 seconds.

When tx-interval is the default value and transmit delay is configured via some commands, tx-interval will become four times of the latter, instead of the default 40.

Example: Set the interval of sending messages as 40 seconds.

Switch(config)#lldp tx-interval 40

5.15 show debugging lldp

Command: show debugging lldp

Function: Display all ports with lldp debug enabled.

Parameters: None.

Default: None.

Command Mode: Admin and Configuration Mode.

Usage Guide: With show debugging lldp, all ports with lldp debug enabled will be displayed.

Example: Display all ports with lldp debug enabled.

Switch(config)#show debugging lldp

====BEGINNING OF LLDP DEBUG SETTINGS====

debug lldp

debug lldp packets interface Ethernet1/1

debug lldp packets interface Ethernet1/2

debug lldp packets interface Ethernet1/3

debug lldp packets interface Ethernet1/4

debug lldp packets interface Ethernet1/5

==========END OF DEBUG SETTINGS==========

5.16 show lldp

Command: show lldp

Function: Display the configuration information of global LLDP, such as the list of all the ports with LLDP enabled, the interval of sending update messages, the configuration of aging time, the interval needed by the sending module to wait for re-initialization, the interval of sending TRAP, the limitation of the number of the entries in the Remote Table.

Parameters: None.

Default: Do not display the configuration information of global LLDP.

Command Mode: Admin Mode, Global Mode.

Usage Guide: Users can check all the configuration information of global LLDP by using “show lldp”.

Example: Check the configuration information of global LLDP after it is enabled on the switch.

Switch(config)#show lldp

-----LLDP GLOBAL INFORMATIONS-----

LLDP enabled port : Ethernet 1/1

LLDP interval :30
LLDP txTTL :120
LLDP txShutdownWhile :2
LLDP NotificationInterval :5
LLDP txDelay :20
----------END----------

5.17 show lldp interface ethernet

Command: show lldp interface ethernet <*IFNAME*>
Function: Display the configuration information of LLDP on the port, such as: the working state of LLDP Agent.
Parameters: <*IFNAME*>: Interface name.
Default: Do not display the configuration information of LLDP on the port.
Command Mode: Admin Mode, Global Mode.
Usage Guide: Users can check the configuration information of LLDP on the port by using “show lldp interface ethernet XXX”.
Example: Check the configuration information of LLDP on the port after LLDP is enabled on the switch.
Switch(config)#show lldp interface ethernet 1/1
Port name: ethernet 1/1
LLDP Agent Adminstatus: Both
LLDP Operation TLV: portDecs sysName sysDesc sysCap
LLDP Trap Status: disable
LLDP maxRemote: 100
LLDP Overflow handle: discard
LLDP interface remote status : Full

5.18 show lldp neighbors interface ethernet

Command: show lldp neighbors interface ethernet < *IFNAME* >
Function: Display the LLDP neighbor information of the port.
Parameters: None.
Default: Do not display the LLDP neighbor information of the port.
Command Mode: Admin Mode, Global Mode.
Usage Guide: Users can check the LLDP neighbor information of the port by using “show lldp neighbors interface ethernet XXX”.

Example: Check the LLDP neighbor information of the port after LLDP is enabled on the port.

Switch(config)#show lldp neighbors interface ethernet 1/1

5.19 show lldp traffic

Command: show lldp traffic

Function: Display the statistics of LLDP data packets.

Parameters: None.

Default: Do not display the statistics of LLDP data packets.

Command Mode: Admin Mode, Global Mode.

Usage Guide: Users can check the statistics of LLDP data packets by using “show lldp traffic”.

Example: Check the statistics of LLDP data packets after LLDP is enabled on the switch.

Switch(config)#show lldp traffic

PortName	Ageouts	FramesDiscarded	FramesInErrors	FramesIn	FramesOut	TLVsDiscarded	TLVsUnrecognized
Ethernet1/1	0	0	0	0	7	0	0

Chapter 6 Commands for Port Channel

6.1 debug port-channel

Command: debug port-channel <*port-group-number*> {all | event | fsm | packet | timer}

no debug port-channel [<*port-group-number*>]

Function: Open the debug switch of port-channel.

Parameters: <*port-group-number*> is the group number of port channel, ranging from 1～14

all: all debug information

event: debug event information

fsm: debug the state machine

packet: debug LACP packet information

timer: debug the timer information

Command mode: Admin mode.

Default: Disable the debugging of port-channel.

Usage Guide: Open the debug switch to check the debug information of port-channel.

Example:

(1)debug the state machine for port-group 1.

Switch#debug port-channel 1 fsm

(2) debug LACP packet information for port-group 2.

Switch#debug port-channel 2 packet

(3) debug all for port-group 1.

Switch#debug port-channel 1 all

6.2 interface port-channel

Command: interface port-channel <*port-channel-number*>

Function: Enters the port channel configuration mode

Command mode: Global Mode

Usage Guide: On entering aggregated port mode, configuration to GVRP or spanning tree modules will apply to aggregated ports; if the aggregated port does not exist (i.e., ports have not been aggregated), an error message will be displayed and configuration will be saved and will be restored until the ports are aggregated. Note such restoration will be performed only once, if an aggregated group is ungrouped and aggregated again, the

initial user configuration will not be restored. If it is configuration for modules, such as shutdown configuration, then the configuration to current port will apply to all member ports in the corresponding port group.

Example: Entering configuration mode for port-channel 1.

Switch(config)#interface port-channel 1

Switch(Config-If-Port-Channel1)#

6.3 lacp port-priority

Command: lacp port-priority <*port-priority*>

no lacp port-priority

Function: Set the port priority of LACP protocol.

Parameters: <*port-priority*>: the port priority of LACP protocol, the range from 0 to 65535.

Command mode: Port Mode.

Default: The default priority is 32768 by system.

Usage Guide: Use this command to modify the port priority of LACP protocol, the no command restores the default value.

Example: Set the port priority of LACP protocol.

Switch(Config-If-Ethernet1/1)# lacp port-priority 30000

6.4 lacp system-priority

Command: lacp system-priority <*system-priority*>

no lacp system-priority

Function: Set the system priority of LACP protocol.

Parameters: <*system-priority*>: The system priority of LACP protocol, ranging from 0 to 65535.

Command mode: Global Mode

Default: The default priority is 32768.

Usage Guide: Use this command to modify the system priority of LACP protocol, the no command restores the default value.

Example: Set the system priority of LACP protocol.

Switch(config)#lacp system-priority 30000

6.5 lacp timeout

Command: lacp timeout {short | long}

no lacp timeout

Function: Set the timeout mode of LACP protocol.

Parameters: The timeout mode includes long and short.

Command mode: Port Mode

Default: Long.

Usage Guide: Set the timeout mode of LACP protocol.

Example: Set the timeout mode as short in LACP protocol.

Switch(Config-If-Ethernet1/1)#lacp timeout short

6.6 load-balance

Command: load-balance {src-mac | dst-mac | dst-src-mac | src-ip | dst-ip | dst-src-ip}

Function: Set load-balance mode for port-group.

Parameter: src-mac performs load-balance according to the source MAC

dst-mac performs load-balance according to the destination MAC

dst-src-mac performs load-balance according to the source and destination MAC

src-ip performs load-balance according to the source IP

dst-ip performs load-balance according to the destination IP

dst-src-ip performs load-balance according to the destination and source IP

Command mode: Aggregation port mode.

Default: Perform load-balance according to the source and destination MAC.

Usage Guide: Use port-channel to implement load-balance, user can configure the load-balance mode according to the requirements. If the specific load-balance mode of the command line is different with the current load-balance mode of port-group, then modify the load-balance of port-group as the specific load-balance of command line; otherwise return a message to notice that the current mode is already configured.

Example: Set load-balance mode of port-group.

Switch(config)#interface port-channel 1

Switch(Config-If-Port-Channel1)#load-balance src-mac

6.7 port-group

Command: port-group <*port-group-number*>

no port-group <*port-group-number*>

Function: Creates a port group. The no command deletes that group.

Parameters: <*port-group-number*> is the group number of a port channel from 1～14.

Default: There is no port-group.

Command mode: Global Mode

Example: Creating a port group.

Switch(config)# port-group 1

Delete a port group.

Switch(config)#no port-group 1

6.8 port-group mode

Command: port-group <*port-group-number*> mode {active | passive | on}

no port-group

Function: Add a physical port to port channel, the no operation removes specified port from the port channel.

Parameters: <*port-group-number*> is the group number of port channel, from 1～14; **active** enables LACP on the port and sets it in Active mode; **passive** enables LACP on the port and sets it in Passive mode; **on** forces the port to join a port channel without enabling LACP.

Command mode: Port Mode.

Default: Switch ports do not belong to a port channel by default; LACP not enabled by default.

Usage Guide: If the specified port group does not exist, then print a error message. All ports in a port group must be added in the same mode, i.e., all ports use the mode used by the first port added. Adding a port in “on” mode is a “forced” action, which means the local end switch port aggregation does not rely on the information of the other end, port aggregation will succeed as long as all ports have consistent VLAN information. Adding a port in “active” or “passive” mode enables LACP. Ports of at least one end must be added in “active” mode, if ports of both ends are added in “passive” mode, the ports will never aggregate.

Example: Under the Port Mode of Ethernet1/1, add current port to “port-group 1” in “active” mode.

Switch(Config-If-Ethernet1/1)#port-group 1 mode active

6.9 show port-group

Command: show port-group [<*port-group-number*>] {brief | detail |}

Function: Display the specified group number or the configuration information of all port-channel which have been configured.

Parameters: ***<port-group-number>*** is the group number of port channel to be displayed, from 1～14; **brief** displays summary information; **detail** displays detailed information.

Command mode: All Configuration Mode.

Usage Guide: If the user does not input port-group-number, that means the information of all the existent port-group are showed; if the port channel corresponds to port-group-number parameter and is not exist, then print a error message, otherwise display the current port-channel information of the specified group number.

Example: 1. Display summary information for port-group 1.

```
Switch#sho port-group brief
ID: port group number; Mode: port group mode such as on active or passive;
Ports: different types of port number of a port group,
    the first is selected ports number, the second is standby ports number, and
    the third is unselected ports number.

ID   Mode    Partner ID                    Ports      Load-balance
--------------------------------------------------------------------------------
1    active  0x8000,00-12-cf-4d-e1-a1  8,1,1      dst-src-mac
10   passive 0x8000,00-12-cf-4d-e1-b2  8,2,0      dst-src-ip
20   on                                8,0,0      src-ip
2. Display the detailed information of port-group 1.
Switch#show port-group 1 detail
Flags:  A -- LACP_Activity, B -- LACP_timeout, C -- Aggregation,
        D -- Synchronization, E -- Collecting, F -- Distributing,
        G -- Defaulted, H -- Expired

Port-group number: 1,   Mode: active,    Load-balance: dst-src-mac
Port-group detail information:
System ID: 0x8000,00-03-0f-0c-16-6d
Local:
Port                Status       Priority  Oper-Key    Flag
--------------------------------------------------------------
```

Ethernet1/1	Selected	32768	1	{ACDEF}
Ethernet1/2	Selected	32768	1	{ACDEF}
Ethernet1/3	Selected	32768	1	{ACDEF}
Ethernet1/4	Selected	32768	1	{ACDEF}
Ethernet1/5	Selected	32768	1	{ACDEF}
Ethernet1/6	Selected	32768	1	{ACDEF}
Ethernet1/7	Selected	32768	1	{ACDEF}
Ethernet1/8	Selected	32768	1	{ACDEF}
Ethernet1/20	Unselected	32768	1	{ACG}
Ethernet1/23	Standby	32768	1	{AC}

Remote:

Actor	Partner	Priority	Oper-Key	SystemID	Flag
Ethernet1/1	1	32768	1	0x8000,00-03-0f-01-02-04	{CDEF}
Ethernet1/2	2	32768	1	0x8000,00-03-0f-01-02-04	{CDEF}
Ethernet1/3	3	32768	1	0x8000,00-03-0f-01-02-04	{CDEF}
Ethernet1/4	4	32768	1	0x8000,00-03-0f-01-02-04	{CDEF}
Ethernet1/5	5	32768	1	0x8000,00-03-0f-01-02-04	{CDEF}
Ethernet1/6	6	32768	1	0x8000,00-03-0f-01-02-04	{CDEF}
Ethernet1/7	7	32768	1	0x8000,00-03-0f-01-02-04	{CDEF}
Ethernet1/8	8	32768	1	0x8000,00-03-0f-01-02-04	{CDEF}
Ethernet1/23	23	32768	1	0x8000,00-03-0f-01-02-04	{C}

Switch#

Chapter 7 Commands for Jumbo

7.1 jumbo enable

Command: jumbo enable [<mtu-value>]

no jumbo enable

Function: Configure the MTU size of JUMBO frame, enable the jumbo receiving/sending function. The no command restores to the normal frame receiving function.

Parameter: mtu-value: the MTU value of jumbo frame that can be received, in byte, ranging from <1500-9000>. The corresponding frame size is <1518/1522-9018/9022>. Without setting is parameter, the allowed max frame size is 9018/9022.

Default: Jumbo function not enabled by default.

Command Mode: Global Mode

Usage Guide: Set switch of both ends jumbo necessarily, or jumbo frame will be dropped at the switch has not be set. Notice: Set the MTU value of JUMBO frame are 1500, 1518, 1982, 2030 bytes for this device only.

Example: Enable the jumbo function of the switch.

Switch(config)#jumbo enable

Chapter 8 Commands for EFM OAM

8.1 clear ethernet-oam

Command: clear ethernet-oam [interface {ethernet |} <*IFNAME*>]

Function: Clear the statistic information of packets and link event on specific or all ports for OAM.

Parameters: <*IFNAME*>, the name of the port needs to clear OAM statistic information

Command Mode: Admin mode

Default: N/A.

Usage Guide: N/A.

Example: Clear the statistic information of OAM packets and link event on all ports.

Switch(config)#clear ethernet-oam

8.2 debug ethernet-oam error

Command: debug ethernet-oam error [interface {ethernet |} <*IFNAME*>]

no debug ethernet-oam error [interface {ethernet |} <*IFNAME*>]

Function: Enable the debugging of OAM error information, no command disables it.

Parameters: <*IFNAME*>: name of the port that the debugging will be enabled or disabled.

Command Mode: Admin mode

Default: Disable.

Usage Guide: N/A.

Example: Enable the debugging of OAM error information for ethernet1/1.

Switch#debug ethernet-oam error interface ethernet1/1

8.3 debug ethernet-oam fsm

Command: debug ethernet-oam fsm {all | Discovery | Transmit} [interface {ethernet |} <*IFNAME*>]

no debug ethernet-oam fsm {all | Discovery | Transmit} [interface {ethernet |} <*IFNAME*>]

Function: Enable the debugging of OAM state machine, no command disables it.

Parameters: <IFNAME>: name of the port that the debugging will be enabled or disabled

Command Mode: Admin mode

Default: Disable.

Usage Guide: N/A.

Example: Enable the debugging of Discovery state machine for ethernet1/1.

Switch#debug ethernet-oam fsm Discovery interface ethernet1/1.

8.4 debug ethernet-oam packet

Command: debug ethernet-oam packet [detail] {all | send | receive} [interface {ethernet |} <*IFNAME*>]

no debug ethernet-oam packet [detail] {all | send | receive} interface {ethernet |} <*IFNAME*>

Function: Enable the debugging of packets received or sent by OAM, no command disables the debugging.

Parameters: <*IFNAME*>: name of the port that the debugging will be enabled or disabled

Command Mode: Admin mode

Default: Disable.

Usage Guide: N/A.

Example: Enable the debugging of packets received or sent for ethernet1/1.

Switch#debug ethernet-oam packet detail all interface1/1

8.5 debug ethernet-oam timer

Command: debug ethernet-oam timer {all | pdu_timer | local_lost_link_timer} [interface {ethernet |} <IFNAME>]

no debug ethernet-oam timer {all | pdu_timer | local_lost_link_timer} [interface {ethernet | } <IFNAME>]

Function: Enable the debugging of refreshing information for specific or all timers, no this command disables the debugging.

Parameters: <*IFNAME*>: name of the port that the debugging will be enabled or disabled

Command Mode: Admin mode

Default: Disable.

Usage Guide: N/A.

Example: Enable the debugging of refreshing information for all timers of ethernet1/1.

Switch#debug ethernet-oam timer all interface ethernet1/1

8.6 ethernet-oam

Command: ethernet-oam

no ethernet-oam

Function: Enable ethernet-oam of ports, no command disables ethernet-oam of ports.

Parameters: None.

Command Mode: Port mode

Default: Disable.

Usage Guide: N/A.

Example: Enable ethernet-oam of Ethernet 1/4.

Switch(config)#interface ethernet 1/4

Switch(Config-If-Ethernet1/4)#ethernet-oam

8.7 ethernet-oam errored-frame threshold high

Command: ethernet-oam errored-frame threshold high {<*high-frames*> | none}

no ethernet-oam errored-frame threshold high

Function: Configure the high threshold of errored frame event, no command restores the default value.

Parameters: <*high-frames*>, the high detection threshold of errored frame event, ranging from 2 to 4294967295.

none, cancel the high threshold configuration.

Command Mode: Port mode

Default: none.

Usage Guide: During the specific detection period, serious link event is induced if the number of errored frame is larger than or equal to the high threshold and the device notifies the peer by sending Information OAMPDU of which the value of Link Fault flag in Flags field is 1. Note that the high threshold can not be less than the low threshold.

Example: Configure the high threshold of errored frame event on Ethernet 1/4 to 3000.

Switch(Config-If-Ethernet1/4)#ethernet-oam errored-frame threshold high 3000

8.8 ethernet-oam errored-frame threshold low

Command: ethernet-oam errored-frame threshold low <*low-frames*>

no ethernet-oam errored-frame threshold low

Function: Configure the low threshold of errored frame event, no command restores the default value.

Parameters: <*low-frames*>, the low detection threshold of errored frame event, ranging from 1 to 4294967295.

Command Mode: Port mode

Default: 1.

Usage Guide: During the specific detection period, errored frame event is induced if the number of errored frame is larger than or equal to the low threshold and the device notifies the peer by sending event notification OAMPDU. Note that the low threshold can not be larger than the high threshold.

Example: Configure the low threshold of errored frame event on Ethernet 1/4 to 100.

Switch(Config-If-Ethernet1/4)#ethernet-oam errored-frame threshold low 100

8.9 ethernet-oam errored-frame window

Command: ethernet-oam errored-frame window <*seconds*>

no ethernet-oam errored-frame window

Function: Configure the detection period of errored frame event, no command restores the default value.

Parameters: <*seconds*>, the detection period value of errored frame event, ranging from 1 to 60 seconds.

Command Mode: Port mode

Default: 1.

Usage Guide: Detect the errored frame number of the port after the time of specific detection period. If the number of errored frame is larger than or equal to the threshold, bring the corresponding event and notify the peer through OAMPDU.

Example: Configure the detection period of errored frame event on port1/4 to 20s.

Switch(Config-If-Ethernet1/4)#ethernet-oam errored-frame window 20

8.10 ethernet-oam errored-frame-period threshold high

Command: ethernet-oam errored-frame-period threshold high {<*high-frames*> | none}

no ethernet-oam errored-frame-period threshold high

Function: Configure the high threshold of errored frame period event, no command restores the default value.

Parameters: <*high-frames*>, the high detection threshold of errored frame period event, ranging from 2 to 4294967295.

none, cancel the high threshold configuration.

Command Mode: Port mode

Default: none.

Usage Guide: During the specific detection period, serious link event is induced if the number of errored frame is larger than or equal to the high threshold and the device notifies the peer by sending Information OAMPDU of which the value of Link Fault flag in Flags field is 1. Note that the high threshold can not be less than the low threshold.

Example: Configure the high threshold of errored frame period event on port 1/4 to 3000.

Switch(Config-If-Ethernet1/4)#ethernet-oam errored-frame-period threshold high 3000

8.11 ethernet-oam errored-frame-period threshold low

Command: ethernet-oam errored-frame-period threshold low <*low-frames*>

no ethernet-oam errored-frame-period threshold low

Function: Configure the low threshold of errored frame period event, no command restores the default value.

Parameters: <*low-frames*>, the low detection threshold of errored frame period event, ranging from 1 to 4294967295 frames.

Command Mode: Port mode

Default: 1.

Usage Guide: During the specific detection period, errored frame period event is induced if the number of errored frame is larger than or equal to the low threshold and the device notifies the peer by event notification OAMPDU. Note that the low threshold should not be larger than the high threshold.

Example: Configure the low threshold of errored frame period event on port 1/4 to 100.

Switch(Config-If-Ethernet1/4)#ethernet-oam errored-frame-period threshold low 100

8.12 ethernet-oam errored-frame-period window

Command: ethernet-oam errored-frame-period window <*seconds*>

no ethernet-oam errored-frame-period window

Function: Configure the detection period of errored frame period event, no command restores the default value.

Parameters: <*seconds*>, the detection period value of errored frame period event, ranging from 1 to 60s.

Command Mode: Port mode

Default: 1.

Usage Guide: Detect errored frame of the port after the time of specific detection period.

If the number of errored frame is larger than or equal to the threshold, corresponding event is induced and the device notifies the peer through OAMPDU. When sending the packets, the maximum number of frames is filled as the value of window in errored frame period event. The conversion rule is maximum number of frames= interface bandwidth× detection period of errored frame period event(s)÷(64×8), of which the detection period is the number of seconds in window of the configuration.

Example: Configure the detection period of errored frame period event on port 1/4 to 10s.

Switch(Config-If-Ethernet1/4)#ethernet-oam errored-frame-period window 10

8.13 ethernet-oam errored-frame-seconds threshold high

Command: ethernet-oam errored-frame-seconds threshold high {<*high-seconds*> | none}

no ethernet-oam errored-frame-seconds threshold high

Function: Configure the high threshold of errored frame seconds event, no command restores the default value.

Parameters: <*high-seconds*>, the high detection threshold of errored frame seconds event, ranging from 2 to 65535 seconds.

none, cancel the high threshold configuration.

Command Mode: Port mode

Default: none.

Usage Guide: During the specific detection period, serious link event is induced if the number of errored frame seconds is larger than or equal to the high threshold and the device notifies the peer by sending Information OAMPDU of which the value of Link Fault flag in Flags field is 1. Note that the high threshold should not be less than the low threshold. The definition of errored frame seconds is the second in which errored frame is received.

Example: Configure the high threshold of errored frame seconds event on port 1/4 to 3000.

Switch(Config-If-Ethernet1/4)#ethernet-oam errored-frame-seconds threshold high 3000

8.14 ethernet-oam errored-frame-seconds threshold low

Command: ethernet-oam errored-frame-seconds threshold low <*low-seconds*>

no ethernet-oam errored-frame-seconds threshold low

Function: Configure the low threshold of errored frame seconds event, no command restores the default value.

Parameters: <*low-seconds*>, the low detection threshold of errored frame seconds event, ranging from 1 to 65535 seconds.

Command Mode: Port mode

Default: 1.

Usage Guide: During the specific detection period, errored frame seconds event is induced if the number of errored frame seconds is larger than or equal to the low threshold and the device notifies the peer by sending event notification OAMPDU. Note that the low threshold should not be larger than the high threshold. The definition of errored frame seconds is the second in which errored frame is received.

Example: Configure the low threshold of errored frame seconds event on port 1/4 to 100.

Switch(Config-If-Ethernet1/4)#ethernet-oam errored-frame-seconds threshold low 100

8.15 ethernet-oam errored-frame-seconds window

Command: ethernet-oam errored-frame-seconds window <*seconds*>

no ethernet-oam errored-frame-seconds window

Function: Configure the detection period of errored frame seconds event, no command restores the default value.

Parameters: <*seconds*>, the detection period value of errored frame seconds event, ranging from 10 to 900 secods.

Command Mode: Port mode

Default: 60.

Usage Guide: Detect errored frame seconds of the port after the time of specific detection period. If the number of errored frame seconds is larger than or equal to the threshold, corresponding event is induced and the device notified the peer through OAMPDU.

Example: Configure the detection period of errored frame seconds event on port 1/4 to 120s.

Switch(Config-If-Ethernet1/4)#ethernet-oam errored-frame-seconds window 120

8.16 ethernet-oam errored-symbol-period threshold high

Command: ethernet-oam errored-symbol-period threshold high {<*high-symbols*> | none}

no ethernet-oam errored-symbol-period threshold high

Function: Configure the high threshold of errored symbol event, no command restores the default value.

Parameters: ***<high-symbols>***, the high detection threshold of errored symbol event, ranging from 2 to 18446744073709551615 symbols.

none, cancel the high threshold configuration.

Command Mode: Port mode

Default: none.

Usage Guide: During the specific detection period, serious link event is induced if the number of errored symbols is larger than or equal to the high threshold and the device notifies the peer by sending Information OAMPDU of which the value of Link Fault flag in Flags field is 1. Note that the high threshold should not be less than the low threshold.

Example: Set the high threshold of errored symbol event on port 1/4 to none.

Switch(Config-If-Ethernet1/4)#ethernet-oam errored-symbol-period threshold high none

8.17 ethernet-oam errored-symbol-period threshold low

Command: ethernet-oam errored-symbol-period threshold low *<low-symbols>*

no ethernet-oam errored-symbol-period threshold low

Function: Configure the low threshold of errored symbol event, no command restores the default value.

Parameters: ***<low-symbols>***, the low threshold of errored symbol event, ranging from 1 to 18446744073709551615 symbols.

none, cancel the high threshold configuration.

Command Mode: Port mode

Default: 1.

Usage Guide: During the specific detection period, errored symbol event is induced if the number of errored symbols is larger than or equal to the low threshold and the device notifies the peer by sending event notification OAMPDU. Note that the low threshold should not be larger than the high threshold.

Example: Set the low threshold of errored symbol event on port 1/4 to 5.

Switch(Config-If-Ethernet1/4)#ethernet-oam errored-symbol-period threshold low 5

8.18 ethernet-oam errored-symbol-period window

Command: ethernet-oam errored-symbol-period window <*seconds*>

no ethernet-oam errored-symbol-period window

Function: Configure the detection period of errored symbol event, no command restores the default value.

Parameters: <*seconds*>, the detection period value of errored symbol event, ranging from 1 to 60s.

Command Mode: Port mode

Default: 1.

Usage Guide: Detect errored symbols of the port after the time of specific detection period. If the number of errored symbols is larger than or equal to the threshold, corresponding event is induced and the device notified the peer through OAMPDU.

Example: Set the detection period of errored symbol event on port 1/4 to be 2s.

Switch(Config-If-Ethernet1/4)#ethernet-oam errored-symbol-period window 2

8.19 ethernet-oam link-monitor

Command: ethernet-oam link-monitor

no ethernet-oam link-monitor

Function: Enable link monitor, no command disables the function.

Parameters: None.

Command Mode: Port mode

Default: Enable.

Usage Guide: Enable OAM to monitor local link errors. Generally link monitor is enabled when enabling OAM function of the port. When OAM link monitor is disabled, although local link error is not monitored, Event information OAMPDU from the peer is still normally received and processed.

Example: Enable the link monitor of port 1/4.

Switch(Config-If-Ethernet1/4)#ethernet-oam link-monitor

8.20 ethernet-oam mode

Command: ethernet-oam mode {active | passive}

no ethernet-oam mode

Function: Configure the mode of OAM function, no command restores the default value.

Parameters: active, active mode

passive, passive mode

Command Mode: Port mode

Default: active mode.

Usage Guide: At least one of the two connected OAM entities should be configured to active mode. Once OAM is enabled, the working mode of OAM cannot be changed and you need to disable OAM function if you have to change the working mode.

Example: Set the mode of OAM function on ethernet 1/4 to passive mode.

Switch(Config-If-Ethernet1/4)#ethernet-oam mode passive

8.21 ethernet-oam period

Command: ethernet-oam period <*seconds*>

no ethernet-oam mode

Function: Configure the transmission period of Information OAMPDU, no command restores the default value.

Parameters: <*seconds*>, sending period, ranging from 1 to 2 seconds.

Command Mode: Port mode

Default: 1s.

Usage Guide: Use this command to configure the transmission interval of Information OAMPDU which keep OAM connection normally.

Example: Set the transmission interval of Information OAMPDU for ethernet 1/4 to be 2s.

Switch(Config-If-Ethernet1/4)# ethernet-oam period 2

8.22 ethernet-oam remote-failure

Command: ethernet-oam remote-failure

no ethernet-oam remote-failure

Function: Enable remote failure indication of OAM, no command disables the function.

Parameters: None.

Command Mode: Port mode

Default: Enable.

Usage Guide: With remote failure indication is enabled, if critical-event or link fault event is occurred locally, it will notify the peer by sending Information OAMPDU, log the fault information and send SNMP trap warning. When the remote failure indication is disabled, although local critical-event or link fault event is not monitored, failure indication information from the peer is still normally received and processed.

Example: Enable remote failure indication of ethernet 1/4.

Switch(Config-If-Ethernet1/4)#ethernet-oam remote-failure

8.23 ethernet-oam remote-loopback

This command is not supported by switch.

8.24 ethernet-oam remote-loopback supported

This command is not supported by switch.

8.25 ethernet-oam timeout

Command: ethernet-oam timeout <*seconds*>

no ethernet-oam timeout

Function: Configure the timeout of OAM connection, no command restores the default value.

Parameters: <*seconds*>, the timeout ranging from 5 to 10 seconds.

Command Mode: Port mode

Default: 5s.

Usage Guide: OAM connection will be disconnected if no OAMPDU is received after specified timeout.

Example: Set the timeout of OAM connection for ethernet 1/4 to 6 seconds.

Switch(Config-If-Ethernet1/4)#ethernet-oam timeout 6

8.26 show ethernet-oam

Command: show ethernet-oam [{local | remote} interface {ethernet |} <*IFNAME*>]

Function: Show Ethernet OAM connection of specified or all ports.

Parameters: Overview information of all Ethernet OAM connections will be shown if no parameters is input

local, show detailed information of local OAM connection

remote, show detailed information of remote OAM connection

<*IFNAME*>, the port that OAM connection information will be shown

Command Mode: Admin mode

Default: N/A.

Usage Guide: N/A.

Example: Show overview information of Ethernet OAM connection.

Switch#show ethernet-oam

Remote-Capability codes: L - Link Monitor, R - Remote Loopback

U - Unidirection, V - Variable Retrieval

Interface	Local-Mode	Local-Capability	Remote-MAC-Addr	Remote-Mode	Remote-Capability
1/1	active	L R	0003.0f02.2e5d	active	L R
1/2	active	L R	0003.0f19.3a3e	avtive	L R
1/4	active	L R	0003.0f26.480c	passive	L R
1/5	active	L R	0003.0f28.020a	active	L R

Field	Description
Interface	port with Ethernet OAM enabled
Local-Mode	Working mode of the local port OAM.
Local-Capability	Functions are supported by local port OAM L - Link Monitor, R - Remote Loopback U - Unidirection, V - Variable Retrieval
Remote-MAC-Addr	MAC address of the peer
Remote-Mode	OAM working mode of the peer
Remote-Capability	Functions are supported by OAM of the peer L - Link Monitor, R - Remote Loopback U - Unidirection, V - Variable Retrieval

Show detailed information of local OAM entity for ethernet 1/2:

Switch#show ethernet-oam local interface ethernet1/2

Ethernet1/2 oam local Information：

oam_status=enable

local _mode=active

period=1s

timeout=8s

Loopback Supported=YES

Unidirectional Support=YES

Link Events=YES

Remote Failure=YES

local_pdu=INFO

local_mux_action=FWD

local_par_action=DISCARD

Max_OAMPDU_Size=1518

OAM_local_flags_field：

Link Fault=0 Dying Gasp=0 Critical Events=0

Packet statistic：

Packets	Send	Receive
OAMPDU	553	21
Information	552	21
Event Notification	1	0
Loopback Control	0	0

Field	Description
oam_status	Status of Ethernet OAM: enable, OAM is enabled; disable, OAM is not enabled.
local _mode	Working mode of Ethernet OAM: active, the port is set as active mode; passive, the port is set as passive mode.
Period	Transmission period of packets
Timeout	Timeout of connection
local_pdu	The way in which the local end processes Ethernet OAMPDUs: RX_INFO, the port only receives Information OAMPDUs and does not send any Ethernet OAMPDUs. LF_INFO, the port only sends Information OAMPDU packets without Information TLV and with their link error flag bits being set. INFO, the port only sends and receives Information OAMPDU packets. ANY, the port sends and receives any OAMPDU packets.
local_mux_action	Working mode of the local transmitter: FWD, the port can send any packets; DISCARD, the port only sends OAMPDU packets and discards others.
local_par_action	Working mode of the local receiver in the following: FWD, receiving any packets is allowed; DISCARD, only OAMPDU packets is received while others are discarded;

	LB, OAM remote loopback is enabled on the port. In this case, all the packets except OAMPDU packets received are returned to their sources along the ways they come.
Loopback Supported	Whether support remote loopback: YES for support and NO for not.
Unidirectional Support	Whether support unidirectional transmission: YES for support and NO for not.
Link Events	Whether support general link events: YES for support and NO for not.
Remote Failure	Whether support severe link events (remote failure indication): YES for support and NO for not.
Link Fault	Whether occur a Link Fault event: 0 for no and 1 for yes.
Dying Gasp	Whether occur a Dying Gasp event: 0 for no and 1 for yes.
Critical Event	Whether occur a Critical Event: 0 for no and 1 for yes.
Max_OAMPDU_Size	The maximum length of OAMPDU is supported.
OAMPDU	Show the number of the OAMPDU packets sent and received which is the sum of three kinds of packets.
Information	Show the number of the Information OAMPDU packets sent and received
Event Notification	Show the number of the Event Notification OAMPDU packets sent and received
Loopback Control	Show the number of the Loopback Control OAMPDU packets sent and received

Display detailed information of remote OAM entity for Ethernet 1/2

Switch#show ethernet-oam remote interface ethernet1/2

Ethernet1/2 oam remote Information：

Remote_Mac_Address=0003.0f19.3a3e

local _mode=active

---

local_pdu=INFO

local_mux_action=FWD

local_par_action=DISCARD

Loopback Supported=YES

Unidirectional Support=NO

Link Events=YES

Remote Failure=YES

Max_OAMPDU_Size=1518

OAM Remote Flags Field：

Link Fault=0 Dying Gasp=0 Critical Event=0

Field	Description
Remote_Mac_Address	MAC address of remote OAM entity
local _mode	Working mode of Ethernet OAM: active, the port is set as active mode; passive, the port is set as passive mode.
local_pdu	The way in which the local end processes Ethernet OAMPDUs: RX_INFO, the port only receives Information OAMPDUs and does not send any Ethernet OAMPDUs. LF_INFO, the port only sends Information OAMPDU packets without Information TLV and with their link error flag bits being set. INFO, the port only sends and receives Information OAMPDU packets. ANY, the port sends and receives any OAMPDU packets.
local_mux_action	Working mode of the local transmitter: FWD, the port can send any packets; DISCARD, the port only sends OAMPDU packets and discards others.
local_par_action	Working mode of the local receiver in the following: FWD, receiving any packets is allowed; DISCARD, only OAMPDU packets is received while others are discarded; LB, OAM remote loopback is enabled on the port. In this case, all the packets except OAMPDU packets received are returned to their sources along the ways they come.
Loopback Supported	Whether support remote loopback: YES for support and NO for not.
Unidirectional Support	Whether support unidirectional transmission: YES for support and NO for not.
Link Events	Whether support general link events: YES for support and NO for not.
Remote Failure	Whether support severe link events: YES for support and NO for not.

Max_OAMPDU_Size	The maximum length of OAMPDU is supported.
Link Fault	Whether occur a Link Fault event: 0 for no and 1 for yes.
Dying Gasp	Whether occur a Dying Gasp event: 0 for no and 1 for yes.
Critical Event	Whether occur a Critical Event: 0 for no and 1 for yes.

8.27 show ethernet-oam events

Command: show ethernet-oam events {local | remote} [interface {ethernet |} *<IFNAME>*]

Function: Shows the statistic information of link events on specified or all ports with OAM enabled, including general link events and severe link events.

Parameters: local, show the detailed information of the local events;

remote, show the detailed information of the remote events;

<IFNAME>, the port that the statistic information of OAM link events needs to be shown, the statistic information of OAM link events for all ports will be shown if this parameter is not specified.

Command Mode: Admin mode

Default: N/A.

Usage Guide: N/A.

Example: Show the statistic information of link events on Ethernet 1/1.

Switch#show ethernet-oam events local interface 1/1

ethernet 1/1 link-events：

OAM_local_errored-symbol-period-events:

---

event time stamp：3539 errored symbol window：1s

errored symbol low threshold：1 errored symbol high threshold：none

errored symbol：1200120 errored running total：2302512542

event running total：232

OAM_local_errored-frame-period-events:

---

event time stamp：3539 errored frame window：10s

errored frame low threshold：1 errored frame high threshold：none

errored frame：1200120 errored running total：2302512542

event running total：52

OAM_local_errored-frame-events:

---

event time stamp：3539 errored frame window：1s
errored frame low threshold：1 errored frame high threshold：none
errored frame：1200120 errored running total：2302512542
event running total：75

OAM_local_errored-frame-seconds-summary-events:

---

event time stamp：3520 errored frame window：60s
errored frame low threshold：1 errored frame high threshold：none
errored frame：1200120 errored running total：2302512542
event running total：232

OAM_local_link-fault：0
OAM_local_dying gasp：0
OAM_local_critical event：0

Field	Description
OAM_local_errored-symbol-period-events	Statistic information of the local errored symbol events
OAM_local_errored-frame-period-events	Statistic information of the local errored frame period events
OAM_local_errored-frame-events	Statistic information of the local errored frame events
OAM_local_errored-frame-seconds-summary-events	Statistic information of the local errored frame seconds events
event time stamp	Time stamp of the event
window	Detection period of the event
low threshold	Low threshold of events detection
high threshold	High threshold of events detection
errored frame	the number of errored frames
errored symbol	the number of errored symbols
errored running total	Total number of errors occurred since the reset of OAM function
event running total	Total number of error events occurred since the reset of OAM function
OAM_local_link-fault	The number of the local link-fault faults
OAM_local_dying gasp	The number of the local dying-gasp

	faults
OAM_local_critical event	The number of the local critical-event faults

8.28 show ethernet-oam link-events configuration

Command: show ethernet-oam link-events configuration [interface {ethernet | } *<IFNAME>*]

Function: Show configuration of link events on specified or all ports with OAM enabled, including detection period and threshold of the events and so on.

Parameters: *<IFNAME>*, the port that the statistic information of OAM link events needs to be shown, the statistic information of OAM link events for all ports will be shown if this parameter is not specified.

Command Mode: Admin mode

Default: N/A.

Usage Guide: N/A.

Example: Show configuration of link events on ethernet 1/1.

```
Switch#show ethernet-oam link-events configuration interface ethernet 1/1
Ethernet 1/1 link-monitor configuration：
event                          high-threshold      low-threshold     window(s)
-------------------------------------------------------------------------------------------------
Err-symbol-Period                   none                1                2
Err-frame-Period                    none                1               10
Err-frame                           none                2                5
Err-frame-second-summary            none                2              600
-------------------------------------------------------------------------------------------------
```

Field	Description
Event	Event type
Err-symbol-Period	Errored symbol event
Err-frame-Period	Errored frame period event
Err-frame	Errored frame event
Err-frame-second-summary	Errored frame seconds event
high-threshold	High threshold
low-threshold	Low threshold
window(s)	Detection period in seconds.

8.29 show ethernet-oam loopback status

This command is not supported by switch.