Content

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 64K.

Bandwidth control is similar to broadcast suppression. There is granularity limitation for the chip; DCS-3650 series 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 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

1.1.3 description

Command: description *<string>*

        no description

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 description of 1/1-2 port as financial.

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

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

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 media-type

Command: media-type {copper | copper-preferred-auto | fiber | sfp-preferred-auto }

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

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

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

Switch(Config-Port-Range)#media-type fiber

1.1.8 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

1.1.9 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

1.1.10 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

1.1.11 port-status query interval

This command is not supported by the switch.

1.1.12 rate-violation

Command: rate-violation [broadcast | multicast | unicast | all] <200-2000000>
        no rate-violation

Function: Set the max packet reception rate of a port. Any packet which violate the packet reception rate to process the control operation (currently shutdown and block operations are supported) of rate-violation. The no command will disable the rate-violation function of a port.

The rate-violation means the port received the packet rate (the number of the received packets per second), it can distinguish the packet type, such as broadcast packet, multicast packet, unicast packet.

Parameters: broadcast: broadcast packet

        multicast: multicast packet

        unicast: unicast packet

        all: all packets

        <200-2000000>: the number of packets allowed to pass per second.

Command Mode: Interface Mode

Default: There is no limit for the packet reception rate.

Usage Guide: This command is mainly used to detect the abnormal port flow. For example, when there are a large number of broadcast packets caused by a loopback, which affect the processing of other tasks, the port will be shut down or block to ensure the normal processing of the switch. This command needs to associate with rate-violation control command.

Example: Set the rate-violation of port 1/8-10 (GB ports) as 10000pps, it will be shutdown after rate-violation and the port recovery time as 1200 seconds, when the packet reception rate exceeds 10000, the port will but shut down, and then, after 1200 seconds, the port will be UP again.

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

Switch(Config-Port-Range)#rate-violation unicast 10000

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

1.1.13 rate-violation control

Command: rate-violation control [shutdown recovery <0-86400> | block]

      no rate-violation control

Function: Set the control operation after the rate-violation of a port, **shutdown** (it needs to configure the recovery time of a port after shutdown) and **block** operations are supported presently. The no operation will disable the rate-violation control operation of a port.

Parameters: shutdown: A port is shutdown after rate-violation.

      block: A port is block after rate-violation, this parameter and MSTP, EAPS(MRPP), Loopback Detection, ULPP are mutually exclusive. If other modules set STP state, this function can not be set to block mode.

      <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 the control operation after rate-violation. **shutdown** or **block** operation can ensure the normal processing to other tasks of the switch. This command needs to associate with rate-violation [broadcast|multicast|unicast|all] <200-2000000> command.

Example: After set the rate-violation of the unicast packet of port 1/8-10 (GB ports) as 10000pps, the port will be block.

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

Switch(Config-Port-Range)#rate-violation unicast 10000

Switch(Config-Port-Range)#rate-violation control block

1.1.14 remote-statistics interval

This command is not supported by the switch.

1.1.15 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

…

1.1.16 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

1.1.17 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

1.1.18 storm-control

Command: storm-control {unicast | broadcast | multicast} *<Kbits>*

　　　　　　no storm-control {unicast | 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 **unicast** 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; DCS-3650 series 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, unicast must be set the same threshold value.

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

Switch(config-if-port-range)#storm-control broadcast 1000

1.1.19 virtual-cable-test

Command: virtual-cable-test interface (ethernet |)IFNAME

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).

Parameter: *<interface-list>*: Port ID

Command Mode: Admin 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 not longer than 100 meters, a deviation of +/-2 meters is allowed. When the port is at Link UP status, a deviation of +/-10 meters is allowed. Notice: the test procedure will block all data flow on the line for 5-10 seconds, and then restore the original status.

Notice: combo port supports VCT function detection only at copper cable port mode, 100M port does not diagnose the link length at Link UP status.

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#virtual-cable-test interface ethernet 1/25

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

1.1.20 switchport discard packet

Command：**switchport discard packet { all | untag }**

no switchport discard packet { all | untag }

Function：Configure the port not to receive any packet or untag; the **no** command cancel the restriction of discard, it means the port is allowed to receive any packet or untag.

Parameters：**all** means it does not receive any packet including untag, tag and the deal packet. **untag** means it does not receive untag.

Command Mode：Port Mode

Default：The default does not have the restriction.

Usage Guide：This command is not suggested to be configured only if there is the special requirement.

Example：   Configure the port of 1/8 not to receive all packets.

Switch(config)#interface ethernet 1/8

Switch(config-if-ethernet1/8)#switchport discard packet all

1.1.21 switchport flood-control

Command: switchport flood-control { bcast|mcast|ucast }

no switchport flood-control { bcast|mcast|ucast }

Function: Configure that switch does not transmit broadcast, unknown multicast or unknown unicast packets any more to the specified port; no command restores the default configuration.

Parameter: bcast: prevents that broadcast packets can not be transmitted to the specified port; **mcast**: prevents that unknown multicast packets can not be transmitted to the specified port; **ucast**: prevents that unknown unicast packets can not be transmitted to the specified port.

Command Mode: Port configuration mode.

Default: Switch transmits broadcast, unknown multicast and unknown unicast packets to other port in broadcast domain.

Usage Guide: This command takes effect for 100M and 1000M ports; it is also takes effect for Access, Trunk and Hybrid ports. When this command is valid, the port will allow unicast or multicast flow to pass after port learned the corresponding unicast mac or multicast mac.

This command only control that broadcast, multicast and unknown unicast packets sent by other ports cannot be transmitted to the specified port, but it cannot control these packets from the specified port. For example, set **switchport flood-control bcast** command in port 1/1, broadcast packets cannot be transmitted from other ports to port 1/1, but port 1/1 can receive and transmit broadcast packets.

Example: Configure flood-control of bcast and mcast for port 1/1 or port 1/8-10 respectively.

Switch(config)#interface ethernet 1/1

Switch(config-if-ethernet1/1)#switchport flood-control bcast

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

Switch(config-if-port-range)#switchport flood-control mcast

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 Ethernet1/10, 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-Ethernet1/5)#lldp disable

5.6 lldp management-address tlv

Command: lldp management-address tlv [A.B.C.D]
　　　　no lldp management-address tlv
Function: Configure to enable the management address tlv of lldp port.
Parameters: A.B.C.D: it is the optional parameter, and it is the management address that user appoints for the port, it must be the unicast IPv4 address.
Default: Disable. The LLDP packet does not have the management address information of the port.
Command Mode: Port Mode.
Usage Guide: User can choose the feat management IPv4 address according to the configuration. If user appointed the management address when enable the function, this address will be used to send the management address TLV; if user does not appoint the management address, choose the IPv4 address from the VLAN layer3 as the management address to send the management address TLV. When the address is not appointed, if there is no feat address, the management address TLV information will not be sent.
Example: Enable the management address TLV function of ethernet 1/1 and appoint the address.
Switch1(Config-If-Ethernet1/1)# lldp management-address tlv 192.168.24.32

5.7 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-Ethernet1/5)#lldp mode receive

5.8 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

5.9 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-Ethernet1/5)# lldp neighbors max-num 200

5.10 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

5.11 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-Ethernet1/5)#lldp tooManyNeighbors delete

5.12 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

5.13 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-Ethernet1/5)# lldp transmit optional tlv portDesc sysCap

5.14 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 ethernet1/5

Switch(Config-If-Ethernet1/5)#lldp trap enable

5.15 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

5.16 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==============

5.17 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------------------

5.18 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-if-ethernet1/1)#show lldp int e 1/1

Port name :Ethernet1/1

LLDP Agent Adminstatus : Both

LLDP Operation TLV : default

LLDP Management Address TLV :

LLDP Management Address TLV status   : enable

Management address type   : ipv4

Management address   : 192.168.23.3

Management address interface type   : IfIndex

Management address interface id   : 0

Management address OID   : 0

LLDP Trap Status : disable

LLDP maxRemote :100

LLDP Overflow handle : discard

LLDP interface remote status : Free

MED Optional TLV : default

MED Trap Status:Disable

MED TLV Transmit Status:Disable

MED Fast Transmit Status:Disable

Master(config-if-ethernet1/1)#

5.19 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-if-ethernet1/1)#show lld nei int e 1/1

Port name : Ethernet1/1

Port Remote Counter : 1

TimeMark :120

ChassisIdSubtype :4

ChassisId :00-03-0f-01-01-03

PortIdSubtype :Local

PortId :16

 LLDP Management Address TLV :

 Management address type   : ipv4

 Management address   : 192.168.23.1

 Management address interface type   : IfIndex

 Management address interface id   : 0

 Management address OID   : 0

5.20 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: Every port joined the port-group must be consistent on the rate, configuration and physical property. 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#show 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}

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}

Switch#

Chapter 7 Commands for MTU

7.1 mtu

Command: mtu [<mtu-value>]

        no mtu

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 frames 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: MTU function not enabled by default.

Command Mode: Global Mode

Usage Guide: Set switch of both ends mtu necessarily, or mtu frame will be dropped at the switch has not be set.

Notice: Set the MTU value of JUMBO frame are 1500, 1518, 1982, 2026 bytes for this device only.

Example: Enable the mtu function of the switch.

Switch(config)#mtu

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 interface ethernet1/1

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 be 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> is the time for counting the specified frame number, its range from 5 to 300, unit is 200ms.

Command Mode: Port mode

Default: 5.

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 be 20s.

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

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 be 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 be 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>* is the time for counting the specified frame number, its range from 1 to 300, unit is 200ms.

Command Mode: Port mode

Default: 5.

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 be 10s.

Switch(Config-If-Ethernet1/4)#ethernet-oam errored-frame-period window 50

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 be 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 be 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>* is the time for counting the specified frame number, its range from 50 to 450, unit is 200ms.

Command Mode: Port mode

Default: 300.

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 be 120s.

Switch(Config-If-Ethernet1/4)#ethernet-oam errored-frame-seconds window 600

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 be 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>* is the time for counting the specified frame number, its range from 5 to 300, unit is 200ms.

Command Mode: Port mode

Default: 5.

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 10

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 be 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

ethernet1/1 link-events：

OAM_local_errored-symbol-period-events:

----

event time stamp：3539   errored symbol window(200ms)：5

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(200ms)：50

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(200ms)：5

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 seconds summary window(200ms)：300

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

Ethernet1/1 link-monitor configuration：

event	high-threshold	low-threshold	window(200ms)
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(200ms)	Detection period, unit is 200ms

8.29 show ethernet-oam loopback status

This command is not supported by switch.

Chapter 9 Commands for PORT SECURITY

9.1 clear port-security

Command: clear port-security {all | configured | dynamic | sticky} [[address *<mac-addr>* | interface *<interface-id>*] [vlan *<vlan-id>*]]

Function: Clear the secure MAC entries for the interfaces.

Parameter: all：All secure MAC entries on the interfaces

       configured：The configured secure MAC

       dynamic：The dynamic secure MAC learnt by the interface

       sticky：The secure MAC of sticky

       mac-addr：The specified secure MAC address

       interface-id：The secure MAC entries of the specified interface

       vlan-id：The specified VLAN

Default: None.

Command Mode: Admin mode

Usage Guide: None.

Example: Clear all secure MACs on the interface.

Switch#clear port-security all

9.2 show port-security

Command: show port-security [interface *<interface-id>*] [address | vlan]

Function: Show port-security configuration.

Parameter: interface-id：Show port-security configuration of the interface.

       address: Show the secure address of the interface.

       vlan: Show the maximum number of each VLAN configured on trunk/hybrid interface.

Default: None.

Command Mode: Any modes

Usage Guide: None.

Example: Show all secure MACs on the interfaces.

Switch# show port-security address interface ethernet 1/1

9.3 switchport port-security

Command: switchport port-security

              no switchport port-security

Function: Configure port-security function for the interface, the no command disables port-security.

Parameter: None.

Default: Disable.

Command Mode: Port mode

Usage Guide: Clear all dynamic MACs after the interface enabled port-security, and all MACs learnt from the interfaces are tagged with FDB_TYPE_PORT_SECURITY_DYNAMIC. After disabling port-security of the interfaces, clear all secure MACs or change them into the dynamic MACs.

Example: Enable port-security on the interface.

Switch(config-if- ethernet1/1)#switchport port-security

9.4 switchport port-security aging

Command: switchport port-security aging {static | time *<value>* | type {absolute | inactivity}}

              no switchport port-security violation aging {static | time | type}

Function: Enable the aging entries of port-security, and specify the aging time and type on the interface.

Parameter: static：Enable the aging of the static MAC address configured on the specified interface.

          time *<value>* ：Specify MAC aging time of the interface, its range from 1 to 1440mins. The default value is 0, that means disable the aging.

          type：Specify the aging type

          absolute：The expiration of the aging timer on the interface, all secure MACs of the interfaces will get aged and be removed from the MAC table.

          inactivity：The expiration of the aging timer on the interface, the entries will get aged without the traffic, the entries are still kept in the aging period with the traffic.

Default: Do not enable port-security aging, the default aging time is 0.

       Aging mode is absolute by default.

       The static entries are not aged by default.

Command Mode: Port mode

Usage Guide: None.

Example: Configure the aging time of the secure MAC as 1 second on the interface.

Switch (config-if- ethernet1/1)# switchport port-security aging time 1

9.5 switchport port-security mac-address

Command: switchport port-security mac-address *<mac-address>* **[vlan** *<vlan-id>***]**

          no switchport port-security mac-address *<mac-address>* **[vlan** *<vlan-id>***]**

Function: Configure the static secure MAC on the interface, the no command cancels the configuration.

Parameter: mac-address：Configure the specified MAC address as the static secure MAC.

          vlan-id：The specified VLAN of the MAC address, it only takes effect on trunk and hybrid interfaces.

Default: No secure MAC is bound by the interface.

Command Mode: Port mode

Usage Guide: When configuring the static secure MAC, pay attention to the number of the current secure MAC whether exceed the maximum MAC limit allowed by the interface. If exceeding the maximum MAC limit, it will result in violation operation.

Example: Configure the secure MAC address on the interface.

Switch (config-if- ethernet1/1)# switchport port-security mac-address 00-00-00-00-00-01

9.6 switchport port-security mac-address sticky

Command: switchport port-security mac-address sticky [*mac-address***] [vlan** *<vlan-id>***]**

          no switchport port-security mac-address sticky [*mac-address***] [vlan** *<vlan-id>***]**

Function: Configure the static secure MAC with the sticky type on the interface, the no command cancels the configured secure MAC.

Parameter: mac-address：Configure the specified MAC address as the static secure MAC with the sticky type.

          vlan-id：The specified VLAN of the MAC address, it only takes effect on trunk and hybrid interfaces.

Default: No secure MAC is bound by the interface with the sticky type.

Command Mode: Port mode

Usage Guide: When configuring the static secure MAC with sticky type, pay attention to

the number of the current secure MAC whether exceed the maximum MAC limit allowed by the interface. If exceeding the maximum MAC limit, it will result in violation operation.

Example: Configure the secure MAC address on the interface.

Switch(config-if-ethernet1/1)#switchport   port-security   mac-address   sticky 00-00-00-00-00-01

9.7 switchport port-security maximum

Command: switchport port-security maximum <*value*> [vlan <*vlan-list*>]

           no switchport port-security maximum <*value*> [vlan <*vlan-list*>]

Function: Configure the maximum number of the secure MAC allowed by the interface, if specifying VLAN parameter, it means the maximum number in the configured VLANs. The no command cancels the maximum number of the secure MAC configured by the interface.

Parameter: value：Configure the maximum number of the secure MAC allowed by the interface, its range between 1 and 128. It is determined by the maximum MAC number of the device.

           vlan-id: Configure the maximum value for the specified VLAN, it only takes effect on trunk and hybrid interfaces.

Default: After enabling port-security, if there is no other configuration, the maximum number of the secure MAC is 1 on the interface. The interface number in VLAN is no limit by default

Command Mode: Port mode

Usage Guide: Pay attention to the coupling relation about the number between the interface and VLAN, set the maximum number configured by the interface as the standard firstly.

Example: Configure the maximum number of the secure MAC on the interface.

Switch(config-if- ethernet1/1)# switchport port-security maximum 100

9.8 switchport port-security violation

Command: switchport port-security violation {protect | recovery | restrict | shutdown}

           no switchport port-security violation

Function: When exceeding the maximum number of the configured MAC addresses, MAC address accessing the interface does not belongs to this interface in MAC address table or a MAC address is configured to several interfaces in same VLAN, both of them

will violate the security of the MAC address.

Parameter: protect：Protect mode, it will trigger the action that do not learn the new MAC, drop the package and do not send the warning.

recovery：After triggering the violation action of the port, the mac learning function can be recovered.

restrict：Restrict mode, it will trigger the action that do not learn the new MAC, drop the package, send snmp trap and record the configuration in syslog.

shutdown：Shutdown mode is the default mode. Under this condition, the interface is disabled directly, send snmp trap and record the configuration in syslog.

Default: Shutdown.

Command Mode: Port mode

Usage Guide: None.

Example: Configure violation mode as protect for the interface.

Switch(config-if-ethernet1/1)#switchport port-security violation protect

Chapter 10 Commands for DDM

10.1 clear transceiver threshold-violation

Command: clear transceiver threshold-violation [interface ethernet <interface-list>]

Function: Clear the threshold violation of the transceiver monitoring.

Parameter: interface ethernet <interface-list>: The interface list that the threshold violation of the transceiver monitoring needs to be cleared.

Command Mode: Admin mode

Default: None.

Usage Guide: None.

Example: Clear he threshold violation of the transceiver monitoring on port 10.

Switch#clear transceiver threshold-violation interface ethernet 1/10

10.2 debug transceiver

Command: debug transceiver {on | off}

Function: Enable/disable DDM debugging.

Parameter: on/off: Enable or disable the debugging.

Command Mode: Admin mode

Default: Off.

Usage Guide: Disable the DDM debugging with ctrl+o.

Example: Enable DDM debugging.

Switch#debug transceiver on

10.3 show transceiver

Command: show transceiver [interface ethernet <interface-list>] [detail]

Function: Show the monitoring of the transceiver.

Parameter: interface ethernet <interface-list>: The interface list that the monitoring of the transceiver needs to be shown.

   detail： Show the detailed monitoring of the transceiver.

Command Mode: User mode, admin mode and global mode

Default: None.

Usage Guide: Temperature can be accurate to the integer, other values can be accurate to the second bit after the radix point. When the parameter exceeds the warning threshold, it is shown with 'W+' or 'W-', when the parameter exceeds the alarm threshold, it is shown with 'A+' or 'A-', no tagged parameter is normal.

Example: Show the brief DDM information of all ports.

Switch#show transceiver

Interface	Temp（℃）	Voltage（V）	Bias（mA）	RX Power（dBM）	TX Power（dBM）
1/9	33	3.31	6.11	-30.54(A-)	-6.01
1/10	33	5.00（W+）	6.11	-20.54(W-)	-6.02

10.4 show transceiver threshold-violation

Command: show transceiver threshold-violation [interface ethernet <interface-list>]

Function: Show the transceiver monitoring.

Parameter: interface ethernet <interface-list>: The interface list that the transceiver monitoring needs to be shown.

Command Mode: Admin mode and global mode

Default: None.

Usage Guide: None.

Example: Show the transceiver monitoring.

Switch(config)#show transceiver threshold-violation interface ethernet 1/9-10

Ethernet 1/9 transceiver threshold-violation information：

Transceiver monitor is enabled. Monitor interval is set to 30 minutes.

The current time is Jan 02 12:30:50 2010.

The last threshold-violation time is Jan 01 1:30:50 2010.

Brief alarm information:

   RX loss of signal

   RX power low

Detail diagnostic and threshold information:

	Diagnostic			Threshold	
	Realtime Value	High Alarm	Low Alarm	High Warn	Low Warn
	-----------------	-----------	-----------	------------	---------
Temperature（℃）	33	70	0	70	0
Voltage（V）	7.31	10.00	0.00	5.00	0.00
Bias current（mA）	3.11	10.30	0.00	5.00	0.00
RX Power（dBM）	-30.54(A-)	9.00	-25.00（-34）	9.00	-25.00
TX Power（dBM）	-1.01	9.00	-12.05	9.00	-10.00

Ethernet 1/10 transceiver threshold-violation information:

Transceiver monitor is disabled. Monitor interval is set to 30 minutes.

The last threshold-violation doesn't exist.

10.5 transceiver-monitoring

Command: transceiver-monitoring {enable | disable}

Function: Enable/ disable the transceiver monitoring.

Parameter: enable/ disable: Enable or disable the function.

Command Mode: Port mode

Default: Disable.

Usage Guide: None.

Example: Enable the transceiver monitoring of ethernet1/1.

Switch(config-if-ethernet1/1)#transceiver-monitoring enable

10.6 transceiver-monitoring interval

Command: transceiver-monitoring interval <minutes>

          no transceiver-monitoring interval

Function: Set the interval of the transceiver monitoring. The no command sets the interval to be the default interval of 15 minutes.

Parameter: <minutes>: The interval of the transceiver monitoring needs to be set.

Command Mode: Global mode

Default: 15 minutes.

Usage Guide: None.

Example: Set the interval of the transceiver monitoring as 1 minute.

Switch(config)#transceiver-monitoring interval 1

10.7 transceiver threshold

Command: transceiver threshold {default | {temperature | voltage | bias | rx-power | tx-power} {high-alarm | low-alarm | high-warn | low-warn} {<value> | default}}

Function: Set the threshold defined by the user.

Parameters: default: Restore the threshold as the default threshold set by the manufacturer. If the monitoring index is not specified, restore all thresholds, if the monitoring index is specified, restore the corresponding threshold only.

          temperature： The monitoring index—temperature

        voltage：The monitoring index—voltage

        bias：The monitoring index—bias current

        rx-power：The monitoring index—receiving power

        tx-power：The monitoring index—sending power

        high-alarm：High-alarm of the monitoring index, namely there is alarm with A+ if exceeding the threshold.

        low-alarm：Low-alarm of the monitoring index, namely there is alarm with A- if exceeding the threshold.

        high-warn：High-warn of the monitoring index, namely there is warning with W+ if exceeding the threshold.

        low-warn：Low-warn of the monitoring index, namely there is warning with W- if exceeding the threshold.

Command Mode: Port mode

Default: The threshold is set by the manufacturer.

Usage Guide: The range of the threshold parameters is shown for each monitoring index in the following:

    Temperature: -128.00~128.00 ℃

    Voltage: 0.00~7.00 V

    Bias current: 0.00~140.00 mA

    x-power: -50.00~9.00 dBM

    tx-power: -50.00~9.00 dBM

    The maximum length of the threshold parameter configured by the user is 20 bits. After the user configured a parameter threshold, the threshold set by the manufacturer will be labeled with the bracket when showing the threshold, and decide whether give an alarm according to the user's configuration.

Example: Configure tx-power threshold of the fiber module, the low-warn threshold is configured as -12 on ethernet1/1.

Switch(config-if-ethernet1/1)#transceiver threshold tx-power low-warning -12

Chapter 11 Commands for LLDP-MED

11.1 civic location

Command: civic location {dhcp server | switch | endpointDev} <country-code>

　　　　no civic location

Function: Configure device type and country code of the location with Civic Address LCI format and enter Civic Address LCI address mode. The no command cancels all configurations of the location with Civic Address LCI format.

Parameters: dhcp server: Set device type to be DHCP server

　　　　switch: Set device type to be Switch

　　　　endpointDev: Set device type to be LLDP-MED Endpoint

　　　　country-code: Set country code which consist of 2 letters, such as DE or US, it should accord the country code of ISO 3166 standard.

Default: No location with Civic Address LCI format is configured on the port.

Command Mode: Port mode

Usage Guide: Configure device type and country code of the location with Civic Address LCI format and enter Civic Address LCI address mode to configure the more detailed location.

Example: Configure device type as switch and country code as US for the location with Civic Address LCI format on Ethernet 9.

Switch(Config-If-Ethernet1/9)# civic location switch US

Switch(Med-Civic)#

11.2 {description-language | province-state | city | county | street | locationNum | location | floor | room | postal | otherInfo}

Command: {description-language | province-state | city | county | street | locationNum | location | floor | room | postal | otherInfo} <address>

　　　　no {description-language | province-state | city | county | street | locationNum | location | floor | room | postal | otherInfo}

Function: Configure the detailed location after enter Civic Address LCI address mode of the port.

Parameters: description-language: language for describing location, such as 'English'

province-state: state, canton, region, province prefecture, and so on, such as 'clara'

city: city, such as 'New York'

county: county, parish, such as 'santa clara'

street: street, such as '1301 Shoreway Road'

locationNum: house number, such as '9'

location: name and occupant of a location, such as 'Carrillo's Holiday Market'

floor: floor number, such as '13'

room: room number, such as '1308'

postal: postal/zip code, such as '10027-1234'

otherInfo: Additional location information, such as 'South Wing'

address: detailed address information, it cannot exceed 250 characters

Default: No detailed information of the location with Civic Address LCI is configured on the port.

Command Mode: Civic Address LCI address mode

Usage Guide: With this command, configure the detailed information of the location with Civic Address LCI on the port, it is able to configure 10 kinds of address types at most.

Example: Configure the detailed location information in Civic Address LCI address mode.

Switch(Med-Civic)# city Beijing

Switch(Med-Civic)# street shangdi

11.3 ecs location

Command: ecs location *<tel-number>*

                no ecs location

Function: Configure the location with ECS ELIN format on the port, the no command cancels the configured location.

Parameter: *<tel-number>*: location characters with ECS ELIN format, such as emergent telephone number, it is character string with the length between 10 and 25.

Default: No location with ECS ELIN format is configured.

Command Mode: Port mode

Usage Guide: Length range of the location character string between 10 and 25 with ECS ELIN format.

Example: Configure the location of ECS ELIN format on port 9.

Switch(Config-If-Ethernet1/9)# ecs location 880-445-3381

11.4 lldp med fast count

Command: lldp med fast count <*value*>

    no lldp med fast count

Function: When the fast LLDP-MED startup mechanism is enabled, it needs to fast send LLDP packets with LLDP-MED TLV, this command sets the value of sending the packets fast, the no command restores the default value.

Parameter: value: The number of sending the packets fast, its range from 1 to 10, unit is entries.

Default: 4.

Command Mode: Global mode

Usage Guide: With this command, set the number for sending the packets fast.

Example:

Switch(config)#lldp med fast count 5

11.5 lldp med trap

Command: lldp med trap {enable | disable}

Function: Configure the specified port to enable or disable the function for sending TRAP message when LLDP-MED network topology is changed.

Parameters: enable: Enable LLDP-MED TRAP for the port

    disable: Disable LLDP-MED TRAP for the port

Default: Disable LLDP-MED TRAP.

Command Mode: Port mode

Usage Guide: Enable or disable LLDP-MED TRAP of the port.

Example: Enable LLDP-MED TRAP of the port 9.

Switch(Config-If-Ethernet1/9)# lldp med trap enable

11.6 lldp transmit med tlv all

Command: lldp transmit med tlv all

    no lldp transmit med tlv all

Function: Configure the specified port to send all LLDP-MED TLVs, the no command disables the function.

Parameter: None.

Default: Port does not enable the function for Sending LLDP-MED TLV.

Command Mode: Port mode

Usage Guide: After configuring this command, if the port is able to send LLDP-MED TLV, the sent LLDP packets with LLDP-MED TLV supported by all switches. However, LLDP packets sent by the port without any LLDP-MED TLV after the switch configured the corresponding no command.

Example: Port 9 enables the function for sending LLDP-MED TLV.

Switch(Config-If-Ethernet1/9)# lldp transmit med tlv all

11.7 lldp transmit med tlv capability

Command: lldp transmit med tlv capability

**   no lldp transmit med tlv capability**

Function: Configure the specified port to send LLDP-MED Capability TLV. The no command disables the capability.

Parameter: None.

Default: The function is disabled for sending LLDP-MED Capability TLV.

Command Mode: Port mode

Usage Guide: After configuring this command, if the port is able to send LLDP-MED TLV, the sent LLDP packets with LLDP-MED Capability TLV. However, LLDP packets sent by the port without LLDP-MED Capability TLV after the switch configured the corresponding no command. Note: LLDP-MED Capability TLV is the important LLDP-MED TLV, if do not configure the port to send LLDP-MED Capability TLV firstly, other LLDP-MED TLV will not be sent.

Example: Port 9 enables the function for sending LLDP-MED Capability TLV.

Switch(Config-If-Ethernet1/9)# lldp transmit med tlv capability

11.8 lldp transmit med tlv extendPoe

Command: lldp transmit med tlv extendPoe

**   no lldp transmit med tlv extendPoe**

Function: Configure the specified port to send LLDP-MED Extended Power-Via-MDI TLV. The no command disables the capability.

Parameter: None.

Default: The function is disabled for sending LLDP-MED Extended Power-Via-MDI TLV.

Command Mode: Port mode

Usage Guide: After configuring this command, if the port is able to send LLDP-MED TLV, LLDP packets with LLDP-MED Extended Power-Via-MDI TLV sent by the port. However, LLDP packets without LLDP-MED Extended Power-Via-MDI TLV sent by the port after the

switch configured the corresponding no command. Note: LLDP-MED Capability TLV sent by the port must be configured before sending LLDP-MED Extended Power-Via-MDI TLV, or else the configuration cannot be successful. If the device does not support PoE or PoE function of the port is disabled, although configuring this command, LLDP-MED Extended Power-Via-MDI TLV will not be sent.

Example: Port 9 enables the function for sending LLDP-MED Extended Power-Via-MDI TLV.

Switch(Config-If-Ethernet1/9)# lldp transmit med tlv extendPoe

11.9 lldp transmit med tlv location

Command: lldp transmit med tlv location

   no lldp transmit med tlv location

Function: Configure the specified port to send LLDP-MED Location Identification TLV. The no command disables this capability.

Parameters: None.

Default: Disable.

Command Mode: Port Mode.

Usage Guide: Configure the specified port to send LLDP-MED Location Identification TLV. After configured this command, if the port has the capability of sending LLDP-MED TLV, the LLDP packets sent from the port will include LLDP-MED Location Identification TLV. Otherwise, the LLDP packets sent from the port will not include LLDP-MED Location Identification TLV by the no command even if the port has the capability of sending LLDP-MED TLV. Notice: Before configuring this function, the capability of sending LLDP-MED Capability TLV must be configured. If the device does not support POE or the POE function of the port is disabled by the command, this TLV will not be sent.

Example: Enable the port 9 to send LLDP-MED Location Identification TLV.

Switch(Config-If-Ethernet1/9)#lldp transmit med tlv location

11.10 lldp transmit med tlv inventory

Command: lldp transmit med tlv inventory

   no lldp transmit med tlv inventory

Function: Configure the specified port to send LLDP-MED Inventory Management TLVs aggregation, TLVs aggregation includes 7 TLVs, they are Hardware Revision TLV, Firmware Revision TLV, Software Revision TLV, Serial Number TLV, Manufacturer Name TLV, Model Name TLV, Asset ID TLV. The no command disables the capability.

Parameter: None.

Default: The function is disabled for sending LLDP-MED Inventory Management TLVs.

Command Mode: Port mode

Usage Guide: After configuring this command, if the port is able to send LLDP-MED TLV, LLDP packets with LLDP-MED Inventory Management TLVs sent by the port. However, LLDP packets without LLDP-MED Inventory Management TLVs sent by the port after the switch configured the corresponding no command. Note: LLDP-MED Capability TLV sent by the port must be configured before sending LLDP-MED Inventory Management TLVs, or else the configuration cannot be successful.

Example: Port 9 enables the function for sending LLDP-MED Inventory Management TLVs.

Switch(Config-If-Ethernet1/9)# lldp transmit med tlv inventory

11.11 lldp transmit med tlv networkPolicy

Command: lldp transmit med tlv networkPolicy

            no lldp transmit med tlv networkPolicy

Function: Configure the specified port to send LLDP-MED Network Policy TLV. The no command disables the capability.

Parameter: None.

Default: The function is disabled for sending LLDP-MED Network Policy TLV.

Command Mode: Port mode

Usage Guide: After configuring this command, if the port is able to send LLDP-MED TLV, LLDP packets with LLDP-MED Network Policy TLV sent by the port. However, LLDP packets without LLDP-MED Network Policy TLV sent by the port after the switch configured the corresponding no command. Note: LLDP-MED Capability TLV sent by the port must be configured before sending LLDP-MED Network Policy TLV, or else the configuration cannot be successful.

Example: Port 9 enables the function for sending LLDP-MED Network Policy TLV.

Switch(Config-If-Ethernet1/9)# lldp transmit med tlv networkPolicy

11.12 network policy

Command: network   policy   {voice | voice-signaling | guest-voice | guest-voice-signaling | softphone-voice | video-conferencing | streaming-video | video-signaling} [status {enable | disable}] [tag {tagged | untagged}] [vid {<*vlan-id*> | dot1p}] [cos <*cos-value*>] [dscp <*dscp-value*>]

no network policy {voice | voice-signaling | guest-voice | guest-voice-signaling | softphone-voice | video-conferencing | streaming- video | video-signaling}

Function: Configure the network policy of the port, including VLAN ID, the supported application (such as voice and video), the application priority and the used policy, and so on.

Parameters: voice, voice-signaling, guest-voice, guest-voice-signaling, softphone-voice, video-conferencing, streaming-video and video-signaling: the application types are supported by the port.

status: Whether the network policy is usable.

enable: Network Policy of the specified application type has been defined, enable is the default value of the network policy.

disable: Network Policy of the specified application type is unknown, the fields (such as VLAN ID, L2 priority and DSCP) are ignored, network connection device will not send TLV of the specified application type.

tag: Configure the specified application to uses **tagged** or **untagged** VLAN method.

tagged: Configure the flow of the specified application to use the tagged vlan method, here, the fields (such as VLAN ID, Layer2 priority and DSCP value) are take effect.

untagged: Configure the flow without tag for the specified application, the fields (such as VLAN ID, Layer2 priority) are ignored, only DSCP value field takes effect. Untagged is the default value of VLAN method.

vid: Configure VLAN ID that the specified application belongs to. When the peer sends the flow of the specified application, it will tag the notified VLAN ID, or else the vlan-id value is 1.

vlan-id: Configure the value of VLAN ID, its range from 1 to 4094.

dot1p: Configure the specified application to tag the flow by using 802.1p priority, at the same time, use vlan 0 to load the flow.

cos: Configure the priority of Ethernet frame for VLAN.

cos-value: Configure the value of Ethernet frame priority for VLAN, its range from 0 to 7, the default value is 5.

dscp: Configure DSCP of VLAN.

dscp-value: DSCP value input by the user, its range from 0 to 63, the default value is 46.

Default: No network policy is configured on the port.

Command Mode: Port mode

Usage Guide: User is able to configure the network policy of many kinds on a port, but

their application types cannot repeat, and a kind of network policy corresponds to a LLDP-MED network policy TLV. If user configures multi-policy for a port, it will send multi-LLDP-MED network policy TLV to a LLDP packet. If user does not configure any network policy, no LLDP-MED network policy TLV is sent to LLDP packet.

Example: Configure the network policy with the application type of voice on port 9.

Switch(Config-If-Ethernet1/9)# network policy voice tag tagged vid 2 cos 6 dscp 23

11.13 show lldp

Command: show lldp

Function: Show the global LLDP and LLDP-MED configuration.

Parameter: None.

Default: None.

Command Mode: Admin mode

Usage Guide: None.

Example: Show the global LLDP and LLDP-MED configuration.

Switch#show lldp

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

LLDP has been enabled globally.

LLDP enabled port : Ethernet1/9

LLDP interval :5

LLDP txTTL :20

LLDP NotificationInterval :5

LLDP txDelay :1

LLDP-MED FastStart Repeat Count :4

-------------END------------------

11.14 show lldp [interface ethernet <IFNAME>]

Command: show lldp [interface ethernet <IFNAME>]

Function: Show LLDP and LLDP-MED configurations on the current port.

Parameter: [interface ethernet <IFNAME>]: Port name

Command Mode: Admin mode

Default: None.

Usage Guide: None.

Example: Show LLDP and LLDP-MED configuration of the port 9.

Switch#show lldp interface ethernet 1/9

Port name :Ethernet1/9

  LLDP Agent Adminstatus : Both

  LLDP Operation TLV : default

  LLDP Trap Status : disable

  LLDP maxRemote :100

  LLDP Overflow handle : discard

  LLDP interface remote status : Free

  MED Optional TLV : capabilities   networkPolicy   location   power   inventory

  MED Trap Status:Enable

  MED TLV Transmit Status:Disable

 MED Fast Transmit Status:Disable

11.15 show lldp neighbors

Command: show lldp neighbors [interface ethernet <*IFNAME*>]

Function: Show LLDP and LLDP-MED information of the neighbors for the port.

Parameter: None.

Default: None.

Command Mode: Admin mode

Usage Guide: With this command, checking LLDP and LLDP-MED information of the neighbors after the port received LLDP packets sent by the neighbors.

Example: Show the neighbor information on port 1.

Switch #show lldp neighbors interface ethernet 1/1

Port name : Ethernet1/1

Port Remote Counter : 1

TimeMark :20

ChassisIdSubtype :4

ChassisId :00-03-0f-00-00-02

PortIdSubtype :Local

PortId :3

PortDesc :Ethernet1/1

SysName :switch

SysDesc :switch Device, Compiled Feb 12 17:39:53 2011

 SoftWare Version 6.2.30.0

 BootRom Version 4.0.1

HardWare Version

Device serial number

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11.16 show lldp traffic

Command: show lldp traffic

Function: Show the statistics of the sent and received packets of LLDP and LLDP-MED.

Parameters: None.

Default: None.

Command Mode: Admin Mode.

Usage Guide: After the port received the LLDP packets from the neighbor, this command can be used to view the statistics of the sent and received packets of LLDP and LLDP-MED.

Example: View the statistics of the sent and received packets after the LLDP function is enabled.

Switch(config)#show lldp traffic

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

Chapter 12 Commands for bpdu-tunnel-protocol

12.1 bpdu-tunnel-protocol

Command: bpdu-tunnel-protocol {stp| gvrp| dot1x| user-defined-protocol <name>}

        no bpdu-tunnel-protocol {stp| gvrp| dot1x| user-defined-protocol <name>}

Function: Enable bpdu-tunnel-protocol function of a protocol on port.

Parameters: stp: Enable bpdu-tunnel-protocol of stp function on port;

        gvrp: Enable bpdu-tunnel-protocol of gvrp function on port;

        dot1x: Enable bpdu-tunnel-protocol of dot1x function on port;

        name: Enable bpdu-tunnel-protocol of the protocol defined by user on port, the protocol name is 1 to 32. It is made up by letters, numbers and underscores and the first letter cannot be underscore.

Default: None.

Command Mode: Port Configuration.

Usage Guide: When the bpdu-tunnel-protocol destination MAC address of a protocol has been configured completely, the bpdu-tunnel-protocol function of the protocol can be enabled on port.stp, gvrp or dot1x functions are exclusive with bpdu-tunnel-protocol on port, it means the bpdu-tunnel-protocol function configuration will be failure if stp, gvrp or dot1x functions are configured on port; if the bpdu-tunnel-protocol function of those protocols is configured on port, stp, gvrp or dot1x functions cannot be configured on port.

Example: Configure bpdu-tunnel-protocol of stp protocol on port 1/1.

Switch(Config-If-Ethernet1/1)# bpdu-tunnel-protocol stp

12.2 bpdu-tunnel-protocol group-mac

Command: bpdu-tunnel-protocol {stp| gvrp| dot1x} {group-mac <mac> | default-group-mac}

        no bpdu-tunnel-protocol {stp| gvrp| dot1x}

Function: Configure bpdu-tunnel-protocol address of the specified protocol. When switch received protocol packets, the destination mac address of the packet which is enabled this command will be replaced to the specified bpdu-tunnel-protocol mac address if the receiving port is enabled bpdu-tunnel-protocol function. If the egress port of the forwarding protocol packet is enabled bpdu-tunnel-protocol function, the destination mac address

which received packet is the address configured by this command; the mac of the protocol packet will be replaced back to the mac of itself on egress port.

Parameters: stp: configure bpdu-tunnel-protocol mac of stp protocol;

gvrp: configure bpdu-tunnel-protocol mac of gvrp protocol;

dot1x: configure bpdu-tunnel-protocol mac of dot1x protocol;

<mac>: bpdu-tunnel-protocol mac address, it must be multicast address and it cannot be protocol retention address, it is from 01-80-c2-00-00-00 to 01-80-c2-00-00-30.

default-group-mac: the default mac address of 01-00-0c-cd-00-02.

Default: None.

Command Mode: Global Mode.

Usage Guide: This command should be completed before configuring bpdu-tunnel-protocol on port.

Example: Configure bpdu-tunnel-protocol mac of stp protocol as 01-01-00-0c -00-02.

Switch(Config)# bpdu-tunnel-protocol stp group-mac 01-01-00-0c -00-02

12.3 bpdu-tunnel-protocol protocol-mac

Command: bpdu-tunnel-protocol user-defined-protocol <name> protocol-mac <mac> {group-mac <mac> | default-group-mac}

no bpdu-tunnel-protocol user-defined-protocol <name>

Function: Configure the protocol feature identified with mac address and appoint bpdu-tunnel-protocol mac of protocol.

Parameters: name: protocol name, it is made up by characters from 1 to 32. It is made up by letters, numbers and underscores and the first letter cannot be underscore.

protocol-mac <mac>: mac address of protocol.

group-mac <mac>: bpdu-tunnel-protocol mac address, it must be multicast address and it cannot be protocol retention address, it is from 01-80-c2-00-00-00 to 01-80-c2-00-00-30

default-group-mac: the default mac address of 01-00-0c-cd-00-02.

Default: None.

Command Mode: Global Mode.

Usage Guide: This command should be completed before configuring bpdu-tunnel-protocol on port.

Example: Configure bpdu-tunnel-protocol mac of mrpp protocol as 01-01-00-0c -00-03.

Switch(Config)# bpdu-tunnel-protocol user-defined-protocol mrpp protocol-mac 00-03-0f-00-00-02 group-mac 01-01-00-0c -00-03

12.4 bpdu-tunnel-protocol ethernetii

Command: bpdu-tunnel-protocol user-defined-protocol <name> protocol-mac <mac> encape-type ethernetii protocol-type <type> {group-mac <mac> | default-group-mac}

no bpdu-tunnel-protocol user-defined-protocol <name>

Function: Configure the protocol feature identified with mac address and protocol type. The package method of this protocol is EthernetII and appoint bpdu-tunnel-protocol mac of protocol.

Parameters: name: protocol name, it is made up by characters from 1 to 32. It is made up by letters, numbers and underscores and the first letter cannot be underscore.

protocol-mac <mac>: mac address of protocol.

<type>: protocol type value, its format is xx-xx.

group-mac <mac>: bpdu-tunnel-protocol mac address, it must be multicast address and it cannot be protocol retention address, it is from 01-80-c2-00-00-00 to 01-80-c2-00-00-30.

default-group-mac: the default mac address of 01-00-0c-cd-00-02.

Default: None.

Command Mode: Global Mode.

Usage Guide: This command should be completed before configuring bpdu-tunnel-protocol on port.

Example: Configure bpdu-tunnel-protocol mac of lldp protocol as 01-01-00-0c -00-04.

Switch(Config)# bpdu-tunnel-protocol user-defined-protocol lldp protocol-mac 01-80-c2-00-00-0e encape-type ethernetii protocol-type 88-cc group-mac 01-01-00-0c -00-04

12.5 bpdu-tunnel-protocol snap

Command: bpdu-tunnel-protocol user-defined-protocol <name> protocol-mac <mac> encape-type snap {oui <oui>| } protocol-type <type> {group-mac <mac> | default-group-mac}

no bpdu-tunnel-protocol user-defined-protocol <name>

Function: Configure the protocol feature identified with mac address, oui and protocol type. The package method of this protocol is 802.3/802.2 SNAP or 802.3/802.2 SNAP RFC 1042 (when OUI is not configured) and appoint bpdu-tunnel-protocol mac of protocol.

Parameters: name: protocol name, it is made up by characters from 1 to 32. It is made up by letters, numbers and underscores and the first letter cannot be underscore.

protocol-mac <mac>: mac address of protocol.

<oui>: protocol oui value, its format is xx-xx-xx.

<type>: protocol type value, its format is xx-xx.

group-mac <mac>: bpdu-tunnel-protocol mac address, it must be multicast address and it cannot be protocol retention address, it is from 01-80-c2-00-00-00 to 01-80-c2-00-00-30.

default-group-mac: the default mac address of 01-00-0c-cd-00-02.

Default: None.

Command Mode: Global Mode.

Usage Guide: This command should be completed before configuring bpdu-tunnel-protocol on port.

Example: Configure bpdu-tunnel-protocol mac of Apple Talk protocol as 01-01-00-0c -00-05.

Switch(Config)# bpdu-tunnel-protocol user-defined-protocol lldp protocol-mac 00-03-c2-00-00-05 encape-type snap oui 08-00-07 protocol-type 80-9b group-mac 01-01-00-0c -00-05

12.6 bpdu-tunnel-protocol llc

Command: bpdu-tunnel-protocol user-defined-protocol <name> protocol-mac <mac> encape-type llc dsap <dsap> ssap <ssap> {group-mac <mac> | default-group-mac}

no bpdu-tunnel-protocol user-defined-protocol <name>

Function: Configure the protocol feature identified with mac address, dsap and ssap. The package method of this protocol is 802.3/802.2 LLC and appoint bpdu-tunnel-protocol mac of protocol.

Parameters: name: protocol name, it is made up by characters from 1 to 32. It is made up by letters, numbers and underscores and the first letter cannot be underscore.

protocol-mac <mac>: mac address of protocol.

<dsap>: protocol dsap value, range is 0 to 255.

<ssap>: protocol ssap value, range is 0 to 255.

group-mac <mac>: bpdu-tunnel-protocol mac address, it must be multicast address and it cannot be protocol retention address, it is from 01-80-c2-00-00-00 to 01-80-c2-00-00-30.

default-group-mac: the default mac address of 01-00-0c-cd-00-02.

Default: None.

Command Mode: Global Mode.

Usage Guide: This command should be completed before configuring

bpdu-tunnel-protocol on port.

Example: Configure bpdu-tunnel-protocol mac of NetBIOS protocol as 01-01-00-0c -00-06.

Switch(Config)# bpdu-tunnel-protocol user-defined-protocol lldp protocol-mac 00-03-c2-00-00-06 encape-type llc dsap 240 ssap 224 group-mac 01-01-00-0c -00-06

Chapter 13 CFM OAM

13.1 clear ethernet cfm

Command: clear ethernet cfm { statistic | traceroute-reply }

Function: Delete the MEP message receive statistic information and tracking of link result.

Parameters: statistic： MEP message receive statistic information

traceroute-reply： Result of automatic tracking of link

Default: None.

Command Mode: Admin Mode.

Usage Guide: Using this command on the switch will delete current MEP message receive statistic information and tracking of link result.

Example: Delete the local MEP message receive statistic information and tracking of link automatically：

Switch#clear ethernet cfm statistic

13.2 continuity-check

Command: continuity-check enable

no continuity-check enable

Function: Open the local CCM message sending and receiving functions.

Parameters: None.

Default: MEP and CCM message sending and receiving functions are closed.

Command Mode: MA Configuration Mode.

Usage Guide: Using this command to open the maintance point of CCM message sending and receiving functions.

Example: Open CCM message sending and receiving functions in the test_ma.

Switch(config)#ethernet cfm domain test_1

Switch (config-ecfm)#service test_ma

Switch (config-ecfm-srv)#continuity-check

13.3 continuity-check interval

Command: continuity-check interval < *interval-value* >

        no continuity-check interval

Function: Configure the time interval value for sending message from MEP to CCM.

Parameters: *interval-value*：Represent the time interval value, the range as 1-7.

Default: the time interval value for sending message from MEP to CCM as 4, it means 1s.

Command Mode: MA Configuration Mode.

Usage Guide: Using the command to amend the time interval value for sending message in all mep of MA. The range is 1-7.

Example: Configure the time interval value as 7 for sending message from MEP to CCM in the particular maintance collection test_ma:

Switch(config)#ethernet cfm domain test_1

Switch (config-ecfm)#service test_ma

Switch(config-ecfm-srv)#continuity-check interval 7

13.4 continuity-check receive

Command: continuity-check receive rmep *<mep-id>* [active time *< time >*]

        no continuity-check receive rmep *<mep-id>*

Function: Open CCM message receiving function and build up rmep in MA.

Parameters: *<mep-id>*：Represent received RMEP number, range is 1- 4094.

        < time >：*Represent the activate time for* RMEP. The range is 0-600, units as second.

Default: MA's CCM message receiving function is closed. Active time default as 0 second, once configure the RMEP, it will open the RMEP receiving function.

Command Mode: MA Configuration Mode.

Usage Guide: Using this command can let the particular rmep CCM can receive the detection function of message in the meplist of MA. Local MEP detection can receive others CCM that is sending from others MEP in the same MA.

Example: Detect the CCM message which sent from the RMEP2 in the particular maintance collection test_ma in MA:

Switch(config)#ethernet cfm domain test_1

Switch (config-ecfm)#service test_ma

Switch(config-ecfm-srv)#continuity-check receive rmep 2

13.5 cos

Command: cos *< cos-value >*

        no cos

Function: Configure the priority of the message that sending from mep.

Parameters: *< cos-value >*：The priority of the message, the range is 0-7.

Default: cos value as 0.

Command Mode: MA Configuration Mode.

Usage Guide: using this command can let the entire message that sending by MEP fillin this cos value or inform out of order in the MA.

Example: Changing the message cos priority as 7 in the particular test_ma.

Switch(config)#ethernet cfm domain test_1

Switch (config-ecfm)#service test_ma

Switch(config-ecfm-srv)# cos 5

13.6 debug ethernet cfm

Command: debug ethernet cfm packet [detail] [lb|lt]

      debug ethernet cfm packet [detail] cc [domain *<md_name>* [service *{ ma-name | number < ma-num > | pvlan < vlan-id > }*]]

      debug ethernet cfm fsm [lb|lt]

      debug ethernet cfm fsm cc [send|received] [domain *<md_name>* [service *{ ma-name | number < ma-num > | pvlan < vlan-id > }*]]

      debug ethernet cfm   timer [domain *< md_name >* [service *{ ma-name | number < ma-num > | pvlan < vlan-id > }*]

      no debug ethernet cfm packet [detail] [lb|lt]

      no debug ethernet cfm packet [detail] cc [domain *<md_name>* [service { ma-name | number *< ma-num >* | pvlan *< vlan-id >* }]]

      no debug ethernet cfm fsm [lb|lt]

      no debug ethernet cfm fsm cc [send|received]   [domain *< md_name >* [service { ma-name | number *< ma-num >* | pvlan *< vlan-id >* }]]

      no debug ethernet cfm   timer [domain *<md_name >* [service { ma-name | number *< ma-num >* | pvlan *< vlan-id >* }]

Function: Open the CFM debug information.

Parameters: packet：Open the message debug information.

      detail：Open the detail message debug information.

      continuity-check：Open the ccmessage debug information.

      send：Open the sending cc message related status debug information.

      received：Open the receiving cc message related status debug information.

      lb：Open lbrelated degub information.

      lt：Open ltrelated debug information.

      fsm：Represent open status machine debug information.

timer：Represent open timer debug information domain.

< *domain_name* >：Represent open particular domain debug information.

< *ma-name* >：Build up the maintance collection name; it can contain 1-43 characters. It can be letter, number, and underline. The first and the last letter cannot be the underline. The maintance collection and domain name cannot exceed than 44 characters.

number < *ma-num* >：The only MA number that mark in the maintance domain.The range is 0~65535.

< *vlan-id* >：Configure the service primary vlan. The range is 1-4094.

Default: debug information close.

Command Mode: Admin Mode.

Usage Guide: This command use to open the CFM message, status machines, timing debug information. It can open all maintance domain debug information.Also, it can contrapose to particular maintance collection for opening the debug function.

Example: Open local CFM debug information.

Switch#debug ethernet cfm all

13.7 debug ethernet cfm error

Command: debug ethernet cfm error

  no debug ethernet cfm error

Function: Display CFM out of order information.

Parameters: None.

Default: Disable.

Command Mode: Admin Mode.

Usage Guide: Using this command to display CFM out of order information.

Example: Display CFM out of order information.

Switch#debug ethernet cfm error

13.8 debug ethernet cfm operation

Command: debug ethernet cfm operation

    no debug ethernet operation

Function: Display CFM platform transfer driveport to sending information.

Parameters: None.

Default: Disable.

Command Mode: Admin Mode.

Usage Guide: Display CFM platform transfer driveport to sending information.

Example: Display local CFM platform transfer driveport to sending information.

Switch#debug ethernet cfm operation

13.9 ethernet cfm alarm

Command: ethernet cfm alarm {delay < *mseconds* > | notification { all | error-xcon | mac-remote-error-xcon | none | remote-error-xcon | xcon} | reset < *mseconds* >}

            no ethernet cfm alarm { delay | notification { all | error-xcon | mac-remote-error-xcon | none | remote-error-xcon | xcon} | reset }

Function: Using the alarm function for error.

Parameters: delay < *mseconds* >：Represent delay the notification time, it needs to continuous to detect of error occour, then it will inform the out of order. The units as ms, the range is 2500-10000. Default value as 2500.

            notification：Configure which error need to be notified.

            all：Represent all the errors need to notify, the error including: DefRDI, DefMACStatus, DefRemote, DefError, and DefXcon.

            error-xcon：Represent sending the notification to tell the DefError and DefXcon defects failure occoured.

            mac-remote-error-xcon：Represent only inform when DefMACStatus, DefRemote, DefError and DefXcon error occou. This value is the default value of the notification error.

            none：No matter what error occoured will not have any notification.

            remote-error-xcon：Represent only inform when DefRemote，DefError and DefXconerror occour.

            xcon：Only DefXconerror will notify.

            reset < *mseconds* >：The reset time for errorring is occour. Once detect the error and notify, this is the time slots that no error should be occoured again. The units: ms, range is 2500-10000. The default value is 10000.

Default: Delay notification is 2.5s, only inform when DefMACStatus, DefRemote, DefError and DefXcon error occour. Next error notification should not be occour within 10s.

Command Mode: Global Mode.

Usage Guide: This command is using for selecting which types of errors to be informed, the delay time for notification and reset time.

Example: configure only notify when xcon error occour.

Switch(config)#ethernet cfm alarm notification xcon

13.10 ethernet cfm auto-traceroute cache

Command: ethernet cfm auto-traceroute cache { size < *size-value* > | hold-time *<minutes>*}

        no ethernet cfm auto-traceroute cache { size | hold-time }

Function: Configure saving the size of automatic LT detection result or over time result.

Parameters: < *size-value* >: Represent automatic LT detection buffer size, the size-value range is 1～100. The unit is the number of time for sending, the default number is 5. It means that the 5 least detection result for buffer.

        <minutes>: Represent automatic saving LTdetection buffer is overtime. The range is 1-65535. The unit is minutes. The default value is 100 minutes. In the other words, the overtime records of buffer will be deleted after 100 minutes.

Default: The buffer just records the 5 least automatic detection result, the overtime as 100minutes.

Command Mode: Global Mode.

Usage Guide: Using this command can configure local automatic saving LT detection result buffer size and over time.

Example: Configure automatic LT detection result over time as 500 minutes:

Switch(config)#ethernet cfm auto-traceroute cache hold-time 500

13.11 ethernet cfm domain

Command: ethernet cfm domain < *domain-name* > level < *level-id* >

        no ethernet cfm domain < *domain-name* >

Function: Build up MD，enter into the MD configuration mode.

Parameters: < *domain-name* >: Build up the maintance domain name, 1-43 characters. It can be letter, number, and underline. The first and the last letter cannot be the underline.

        < *level-id* >: Build up maintance domain level. The range is 0-7.

Default: None.

Command Mode: Global Mode.

Usage Guide: Build up MD. Under the default mode, do not build up the MD. When the MD name is illegal or not exist, it will not build up the maintance domain. In the same switch, it can configure multi level of domain with different name. But in the same maintance domain it can only have one level; after build up the maintance domain, it cannot be amended.

Example: Build up the level 3 MD which name as operatorA

Switch(config)#ethernet cfm domain operatorA level 3

Switch(config-ecfm)#

13.12 ethernet cfm global

Command: ethernet cfm global

               no ethernet cfm global

Function: Open local CFM function.

Parameters: None.

Default: Close.

Command Mode: Global Mode.

Usage Guide: Using this command to open the CFM-OAM function of this computer.

Example: open CFM-OAMfunction：

Switch(config)#ethernet cfm global

13.13 ethernet cfm logging

Command: ethernet cfm logging

               no ethernet cfm logging

Function: Open CFM registry log function.

Parameters: None.

Default: alarm record in log.

Command Mode: Global Mode.

Usage Guide: Open the log record function. If alarm is occour, it means that has already
recorded or inform out of order.

Example: Open CFM record log function：

Switch(config)#ethernet cfm logging

13.14 ethernet cfm mep

Command: ethernet cfm mep < *mepid* **> domain <** *domain-name* **> service { <**
ma-name **> | number <** *ma-num* **> | pvlan <** *vlan-id* **> }**

               no ethernet cfm mep < mepid > domain < domain-name > service { <
ma-name > | number < ma-num > | pvlan < vlan-id > }

Function: Build up MEP

Parameters: < *domain-name* **>：** Domain name of maintance

           < *mepid* **>：** Represent the number of the maintance point

           < *ma-name* **>：** Build up the name of maintance collection

< ma-num >： The only MA number that label in the maintance domain. The range is 0-65535.

< vlan-id >： Configure service primary vlan. The range is 1-4094.

Default: MEP does not exist on the port.

Command Mode: Port Configuration Mode.

Usage Guide: MD must be exised in the command, otherwise it will occour error. If this port would like to configure be MEP for several MDs. Can through this command for build up; vlan in the command must already saved in the primary vlan of maintance collection,it means that must use this vlan to find out the corresponding MA, otherwise error occours.

Example: Build up the MA ID as 5 MEP in the ma1 of CustomerB in the e1/1.

Switch(config)#interface ethernet 1/1

Switch(config-if-ethernet1/1)#ethernet cfm mep 5 domain CustomerB service ma1

13.15 ethernet cfm mip

Command: ethernet cfm mip auto-create level < level-id > vlan < WORD > [lower-mep-only] [sender-id chassis]

     no ethernet cfm mip auto-create level

Function: Build up the MIP configureation on the layer that does not relate to MA.

Parameters: < level-id >： Build up default maintance domain level. The range is 0-7.

<WORD>： Configure build up MIP that is not related to ma vlan list. The range is 1~4094, use ";" and "-" for connection.

lower-mep-only： It means the rules of Explicit. It represent if the particular port does not have higher level of MEP, at the lower level of maintance if there is no mid point, whether this level build up the mid point depends on the lower of maintance collection have maintance point or not. If not enter into this parameter, it means that using the default as the rules. If the particular do not have much higher MEP, and the lower maintance does not has maintance mid point, then this level will build up the maintance mid point.

sender-id chassis： Represent the message of the created mip on the default maintance domain will carry Sender ID TLV for sending. If this parameter does not enter, it means that not carry this TLV.

Default: Does not configure the maintance mid point build up rules, and also not exist the maintance mid point. Default not carries sender-id.

Command Mode: Global Mode.

Usage Guide: This build up MIP priority is lower than the manual MIP command (ethernet cfm mip level), it means that under the Port Mode, using the manual command to build up the MIP does not use the manual build up rules. 802.1ag2007standard prescribe each

facilities can have one default MD. If you need to maintance the MD, please delete the original default MD, and build up the new one. The default MD level must be higher than the MEP all MD level, and the priority is equal to the higher MD, use higher level of CCM message to pass through, build up the MIP node recover LTR message.

Example: In the vlan 500, the rule for build up the MIP level on the level 6 port.

Switch(config)#ethernet cfm mip auto-create level 6 vlan 500 lower-mep-only

13.16 ethernet cfm mode

Command: ethernet cfm mode {hw|sw|auto}
              no ethernet cfm mode
Function: Configure the actualizemethod for the facilities.
Parameter: hw： The supporting method of facilities as hardware.
              sw： The supporting method of facilities as software.
              auto： The supporting method of facilities as auto depends on the automatic detection for deciding using which method. If the supporting method of all slave cards are consist, then using that method. Otherwise, use the software supporting method.
Default: Automatic.
Command Mode: Global Mode.
Usage Guide: This command is use for the machice mode switch, if the supporting method is not equal for the the slave card, then it can configure as the support mode.
Example: Under the Global Mode to configure the CFM supporting method as hardware.
Switch(config)# ethernet cfm mode hw

13.17 ethernet cfm pvlan

Command: ethernet cfm pvlan *<1-4094>* vlan WORD
              no ethernet cfm pvlan *<1-4094>*
Function: Configure pvlan and vlan corresponding relationship.
Parameters: *< vlan-id >：* Configure primary vlan. The range is 1~4094.
        < WORD >： Configure the pvlan related vlans.
Default: No corresponding relationship between pvlan and vlan.
Command Mode: Global Mode
Usage Guide: This command can configure pvlan and vlan corresponding relation. And MA is relating to one pvlan. Therefore, one MA can relate to several of vlans. Please pay attention to the ma that is related to the pvlan will not be configured with the vlan corresponding relation.

Example: Configure pvlan1 and vlan10 corresponding relation.

Switch(config)#ethernet   cfm pvlan 1 vlan 10

13.18 ethernet cfm snmp-server enable traps

Command: ethernet cfm snmp-server enable traps

            no ethernet cfm snmp-server enable traps

Function: Having the snmp notification during the alarm.

Parameters: None.

Default: Open the trap notification function.

Command Mode: Global Mode.

Usage Guide: If the set up is success, it will have the snmp notification during the alarm.

Example: configure the trap notification duaring alarm.

Switch(config)# ethernet cfm snmp-server enable traps

13.19 ethernet cfm y1731 global

Command: ethernet cfm y1731 global

            no ethernet cfm y1731 global

Function: Open the y1731 function.

Parameters: None.

Default: Close the y1731 fuction.

Command Mode: Global Mode.

Usage Guide: Open the Y1731 function. After initial this function, the switch will ente into the y1731 mode. The messages are sending and decoding in the Y1731 format.

Notice: It need to use the ethernet cfm global command before using this command, otherwise, it cannot be function.

Example: Global open the y1731 function:

Switch(config)# ethernet cfm y1731 global

13.20 id

Command: id   {mac-address   XX-XX-XX-XX-XX-XX   domain-number   <
domain-number **> | dns <** *dns-name* **> | null }**

            no id

Function: Configure MDID.

Parameters: mac-address   XX-XX-XX-XX-XX-XX   domain-number   <

domain-number >：Three corresponding format names in the name of maintance domain resolve. Domain-number is two byte integral number.

dns < *dns-name* >：The name of DNS. Two of the format names of corresponding maintance domain resolve. 1-43 characters string.

null：One of the format names of corresponding maintance domain resolve which does not configure md name, MA name is the unique name in the global.

Default: None.

Command Mode: MD Configuration Mode.

Usage Guide: Configure this command means that domain-name which is configured by the name of maintance domain will use the command of *ethernet cfm domain* will not be fill in the message. Fill in the MDID and ma name will create MAID; the total length of MAID is 44. The length cannot be existed; otherwise, it will have error.

Example: Configure MDID.

Switch(config)#ethernet cfm domain customerA level 5

Switch(config-ecfm)#id mac-address 00-03-0f-07-08-09 domain-number 1017

13.21 mep mepid

Command: mep mepid < *WORD* >

no mep mepid [< *WORD* >]

Function: Build up the MEP permit configuration table

Parameters: <*WORD*>：Represent the maintance base point table. Using "；"and "-" to connect. The range is 1-4094.

Default: None.

Command Mode: MA Configuration Mode.

Usage Guide: Using this command to build up the permit configured MEP table in the maintance collection.

Example: Build up a mepid in the vlan 5 service of operatorA in maintance domain; the range of mepid is 1-25:

Switch(config)#ethernet cfm domain operatorA level 5

Switch(config-ecfm)#service ma1 vlan 5

Switch(config-ecfm-srv)#mep mepid 1-25

13.22 mip auto-create

Command: mip auto-create [lower-mep-only | none]

no mip auto-create

Function: Configure the automatic MIP in the maintance collection's domain.

Parameters: lower-mep-only：Mean that Explicit rules, represent if there is no higher priority MEP in the particular port, and there is no mid point in the lower maintance collection. To consider whether build up the mid point depends on if there is a maintance base point in the lower level of maintance collection.

                none：Mean that nonerules, under this mode, cannot build up MIP activitely.

Default: Cannot create the mip point.

Command Mode: MA Configuration Mode.

Usage Guide: Using to configure the build up rules for the mid point of the automatic maintance collection. The mid point of maintance is according to the rules to build up on the port of VLAN automatically. No need to enter into any parameters, just follow the default rules to build up. Default rules mean that if there is no higher level of MEP in the port, and no maintance mid point in the lower level of maintance collection. Then this level will build up the maintance mid point.

Notice: The priority of this build up MIP is lower than the MIP command (ethernet cfm mip level) which is build up manually. That is, should not use the automatic build up rules while you use manual build up command in the Port Mode.

If you want to create the the maintance mid point in all of the ports of maintance domain, then select the default rules. If you just want to create the maintance mid point in the base point of lower maintance level, then select the explicit rules.

If the rules to build up the MIP in ma are different from md, then it will follow the ma rules to undergo the establishment.

Because of the number of mip cannot exist than 384, undergo the establishment will according to the rules to build up. If the number exists the range, then establishment is ineffective and occour error.

The default value of md is none; default value of mip under ma is defer. That means default to accede the mip build up value of md.

Example: Configure the mid point build up rules as default in the 5 maintance domain customerA.

Switch(config)#ethernet cfm domain customerA level 5

Switch(config-ecfm)#mip auto-create

13.23 ping ethernet

Command: ping ethernet [target-mep < *mepid* > | target-mac < *mac-address* >] {domain < *domain-name* > service { < *ma-name* > | number < *ma-num* > | pvlan < *vlan-id* > }} [number < *number* >] [packetsize < *size* >] [timeout < *timeout* >]

Function: Open the circulate function.

Parameters: < *mepid* **>**：Represent the maintance base point number of the LBM message destation.

   < *mac-address* **>**：Represent the destation MAC address, the format of mac-address is H-H-H.

   < *domain-name* **>**：It is the maintance domain name of the destation MP.

   < *ma-name* **>**：It is the name of build up maintance collection. 1～43 characters straing.It can be formed by letter, number, underline and the first and the last character cannot be underline.

   number **<** *ma-num* **>**：The only number which label the MA in the maintance domain. The range is 0~65535.

   < *vlan-id* **>**：Configure service primary vlan. The range is 1~4094.

   < *number* **>**：The number of the LMB messages that has already sent. The range of the number is 1～10, default value is 5.

   < *size* **>**：It is the size of the LBM data package. The range is 46~1500byte, the default value is 46.

   < *timeout* **>**：Represent the LBM messages which have already sent timeout. If it cannot receive the LBR within the time, then it will leave the LB processes. The range is 3-10, default time is 5s.

Default: The circulate function close. After open the function, the number of LBM message is 5, the size is within 46 character strings, timeout is 5s.

Command Mode: Admin Mode.

Usage Guide: Send LBM messages and receiving LBR message from a particular maintance point to the other points. Under the default stage, this function is closed. If enter into target-mep-id, it cannot searching the corresponding mac address. If it cannot find, it will display error. If you enter the mac address, then will according to this address for the circulation. If it is a domain-name, then it require opening the y1731function, then sending the group broadcast LBM message.

Example: Open the circulation function; check the maintance base point 2 linkage statuses of test_ma.

Swtich#ping ethernet target-mep 2 domain test_ma service 4

Reply from 00-03-0f-00-00-03: bytes = 46 sequence number=0

Reply from 00-03-0f-00-00-03: bytes = 46 sequence number=1

Reply from 00-03-0f-00-00-03: bytes = 46 sequence number=2

Reply from 00-03-0f-00-00-03: bytes = 46 sequence number=3

Reply from 00-03-0f-00-00-03: bytes = 46 sequence number=4

Packets statistics for 00-03-0f-00-00-03:

Sent = 5, Received = 5, Lost = 0 (0% loss).

Approximate round trip times in milli-seconds:

Minimum < 16 ms, Maximum = 16 ms, Average < 16 ms.

Field	Description
Reply from 00-03-0f-00-00-03	MAC as 00-03-0f-00-00-03 facility recover toLBR
bytes = 46	Recover the LBR messages size to 32bytes
sequence number	Recover the LBR sequence number
Packets statistics for 00-03-0f-00-00-03	MAC as 00-03-0f-00-00-03 facility receive the LBR
Send	The number of current LBM
Received	Receive the number of replay recover LBR
Lost	The number of drop LBM or LBR
Minimum	The shorest time that ping sending to LBM and receive from LBR
Maximum	The longest time that ping sending to LBM and receive from LBR
Average	The average time that ping sending to LBM and receive from LBR

13.24 sender-id

Command: sender-id { chassis | none}

Function: Configure the sending messages if there is sender id information.

Parameters: chassis：The sending message contains of chassis idinformation.

               none：The sending message does not contain of Sender ID TLV.

Default: The sending messages do not contain Sender ID TLV.

Command Mode: MA Configuration Mode.

Usage Guide: Using this command to decide whether the message contains of sender-id information.

Example: Configurate the message to carry chassis id information in the particular ma.

Switch(config-ecfm-srv)#sender-id chassis

13.25 service

Command: service { < ma-name > | number < ma-num > | pvlan < vlan-id > }{ port |
pvlan < vlan-id > } [direction down]

        no service { < ma-name > | number < ma-num > | pvlan   < vlan-id > }

Function: Build up MA.

Parameters: < *ma-name* >： Build up the name of maintance ,1～43 characters. It can be formed by letter, number, underline and the first and the last character cannot be underline. The total number of the collection and the domain name cannot exist than 44 characters.

number < *ma-num* >： The only number which label the MA in the maintance domain. The range is 0~65535.

< *vlan-id* >： Configure the service primary vlan. The range is 1~4094.

port： This is not related to any vlan.

direction down： The direction of maintance collection, the default value as up, entering this command means down.

Default: Do not build up maintance collection.

Command Mode: MD configuration mode.

Usage Guide: In the same domain, the maintance collection is the unquie one. If thedomain name is null, then the collection represent is unquie one in the global.

If it is not include Maintenance Domain Name, the name of collection cannot exist than 45 characters. If it includes the Maintenance Domain Name, then the domain name cannot exist than 43 characters.Also the sum of collection name and the domain name should not bigger than 44 characters.

Before build up the collection, it must build up the domain. One switch can configure maximum 512 MA.

One service can related to one or more vlan. If the configured service direction as down, then several levels' service can relate to same vlans. If the direction is up service, then it cannot relate to same vlans.

One primary vlan cannot relate by different level of domain md, primary vlan and level can confirm the ma.

If configure one service as port, then not relate to vlan, service is only link to these two point. And the mep contains in service should be down mep, will only sending between these two point, and cannot be transmit.

Example: In the maintance collection customerA to build up ID as 10, the related VLAN 17 direction as down collection.

Switch(config)#ethernet cfm domain customerA level 5

Switch(config-ecfm)#service 10 vlan 17 direction down

Switch(config-ecfm-srv)#

13.26 show ethernet cfm domain

Command: show ethernet cfm domain { < domain_name > | brief }

Function: Display the configured information of maintance domain.

Parameters: < *domain-name* >：Build up the domain name, 1～43 characters. .It can be formed by letter, number, underline and the first and the last character cannot be underline.If it cannot be appointed, then it will display all the domains in the facilities.

　　　　　brief：Display the brief maintance domain information.

Default: None.

Command Mode: Admin Mode.

Usage Guide: To display the configured information in MD.

Example: Display all the configured information that is in the local maintance domain.

Switch#show ethernet cfm domain brief

Domain Name	Level	Services Number

| test_ma | Lv4 | 2 |

Field	Description
Domain Name	The domain name of maintance, it is the only label in the domain
Level	The level of maintance domain
Services Number	The number of maintance collection contains in the domain name

Display the configured information that is in the local maintance domain in test_ma.

Switch#show ethernet cfm domain test_ma

Domain Name: test_ma

Level: 4

Total Services: 2

Service Name	Primary Vlan	Dir	CC Send	CC Received	CC Interval

----

| 4 | Vlan1 | Down | Enable | Enable | 1(s) |
| 1 | Vlan2 | Up | Disable | Disable | 1(s) |

Field	Description
Domain Name	The domain name of maintance, it is the only label in the domain
Level	The level of maintance domain
Total Services	The number of maintance collection contains in the domain name
Service Name	The name of maintance collection
Primary Vlan	Maintance collection that is related to Vlan
Dir	The direction of maintance collection
CC Send	The sending function of CC in maintance

	collection
CC Received	The received function of CC in maintance collection
CC Interval	The interval of CC sending in maintance collection

13.27 show ethernet cfm errors

Command: show ethernet cfm errors

Function: Display the errors that are detected on the facility.

Parameters: None.

Default: None.

Command Mode: Admin Mode.

Usage Guide: Display the errors that are detected on the facility.

Example: Display the errors that are detected on the facility.

Switch(config))#show ethernet cfm errors

Code ： X – xconCCDomainefect, E – errorCCDomainefect, O - someRMEPCCDomainefect，M – someMACstatusDefect, R - someRDIdefect

Mepid	Error type	Domain name	Service name	Level
1	X E	kk	ma	lv7
1	X E	kk	ma	lv7
1	X E	kk	ma	lv7
1	X E	kk	ma	lv7

Field	Description
MEPID	Detected errors in the Local MEPID
DOMAIN id	The DOMAIN name of MEP that is the detected errors located
MAName	MA name of the detected errors MEP
error-type	Types of error, including：xconCCDomainefect, errorCCDomainefect, someRMEPCCDomainefect, someMACstatusDefect, someRDIdefect
Level	The level that MEP belongs to

13.28 show ethernet cfm maintenance-points local

Command: show ethernet cfm maintenance-points local [detail] [mep | mip] [domain < *domain-name* > | interface { ethernet | } *<IFNAME>*]
Function: Display the attribute and the operation information of the maintance basepoint.
Parameters: detail：Display the detail information.

　　　　　mep：Display the MEP information.

　　　　　mip：Display the MIP information.

　　　　　< *domain-name* >: The domain name of the maintance domain.

　　　　　interface { ethernet | } *<IFNAME>*： The port that is maintance point located.
Default: None.
Command Mode: Admin Mode.
Usage Guide: Display the local maintance base point information. Please pay attention to the following: if there are no selectable parameters, then display all the mp basic information on the switch. Can undergo the following screening range to display the MP: appointed maintance domain or particular port.
Example: Display all the local MP information on the switch.
Switch#show ethernet cfm maintenance-points local mep

```
---------------------------------------------------------------------------------------------------------
Mepid     Domain Name      Level            Vlan-id          CC Send
          Service Name     Direction        Port
---------------------------------------------------------------------------------------------------------

1         test_ma          Lv4              Vlan1            Enable
          4                Down             Ethernet1/4
```

Field	Description
Mepid	MP label.If it is mip, then None.
Domain Id	The domain id label
MA Name	The name of MA
Lvl	The level which MP belongs to
Dir	MP direction
Port	MP located port
Type	Types of MEP（VLAN or port）
Vlan-id	MEP related vlan id list
CC	Whether CC function is open

Switch#show ethernet cfm maintenance-points local detail mep
Mepid:11

Port:Ethernet1/1   Active:0

Domain Name:kk

Service Name:mb

Level:2   Vlan:None   Direction:Down

CCM:

CC   Send:Enable   CC   Received:Enable   Interval:1(s)

No CCM from some remote MEPs is received.

One or more error CCM is received. The last-received CCM:

Domain Name: kk

Service Name: ma

Mepid:2

Received Time:Jan 01 00:17:25 2006

One or more cross-connect CCM is received. The last-received CCM:

Domain Name: kk

Service Name: ma

Mepid:2

Received Time:Jan 01 00:17:25 2006

Some other MEPs are transmitting the RDI bit.

Field	Description
Interface	The port that is maintance base point located
DOMAIN	The domain that is maintance base point located
SERVICE	The maintance collection that is maintance base point located
Level	The level of domain
VLAN	The VLAN that is maintance collection point located
Direction	The maintance base point direction
CCM	CCM related information
CCM send	Whether base point sending CCM message
CCM received	Whether base point receiving CCM message
Interval	The interval to sending CCM
Crosscheck	Whether the base point is checking cross error
Start-delay	The delay time for cross check

No CCM from some remote MEPs is received	To tell not receiving outlying MEP sending CCM message（occour the time out error）
One or more streams of error CCMs is received. The last-received CCM	To tell receiving error CCM message and display the last error message information
DOMAIN	The domain of last error CCM message
SERVICE	The service of last error CCM message
MEP	The MEP of last error CCM message
Received Time	The received time of last error CCM message
One or more cross-connect CCMs is received. The last-received CCM	The network may have the cross connection, this message means that to tell receiving cross connection message and display the last message information
Some other MEPs are transmitting the RDI bi	Receiving others maintance base point sending RDI （reverse error）that is configure by the CCM message（this will only display when receive the CCM message）

13.29 show ethernet cfm maintenance-points remote

Command: show ethernet cfm maintenance-points remote (domain WORD (service (WORD|number *<0-65535>*|pvlan *<1-4094>*) (mepid *<1-4094>*|)|)|)

Function: Display the attribute and operation information of outlaying maintance base point.

Parameters: *< domain-name >*： The maintance domain name.

**   *< mepid >*：** Represent the maintance base point number.

**   *< ma-name >：*** It is the name of build up maintance collection. 1～43 characters straing.It can be formed by letter, number, underline and the first and the last character cannot be underline.

**   number *< ma-num >*：** The only number which label the MA in the maintance domain. The range is 0~65535.

**   *< vlan-id >*：** Configure service primary vlan. The range is 1~4094.

Default: None.

Command Mode: Admin Mode.

Usage Guide: Display the outlying base point information. Please pay attention: if there are no selectable parameters, then it will display all the outlying mep basic information on the switch.

Example: Display all the MP information of the switch.

Switch#show ethernet cfm maintenance-points remote

Mepid	Domain Name	Level	Mac Address	RDI
	Service Name	Vlanid	Ingress	Status

| 2 | test_ma | Lv4 | 00-03-0f-00-00-03 | Y |
| | 4 | Vlan1 | Ethernet1/4 | Linkup |

Field	Description
Mepid	MEP label
Domain Name	The domain name
Level	The level of maintance domain
Mac Address	MEP mac address
RDI	Whether the RDI of CCM message which is sending from outlying MEP location is 1
Service Name	The name of maintance collection
Vlanid	The related Vlan of maintance collection
Ingress	Outlaying MEP message enter port
Status	Outlaying MEP status

13.30 show ethernet cfm maintenance-points remote detail

Command: show ethernet cfm maintenance-points remote detail (mac XX-XX-XX-XX-XX-XX | domain WORD (service ((WORD)|(number *<0-65535>*)|(pvlan *<1-4094>*))) mepid *<1-4094>*)

Function: Display the attribute and the operation information for the outlaying maintance base point.

Parameters: mac *< mac-address >*： MEP mac address.

< mepid >：Represent the maintance base point number.

< domain-name >：The maintance domain name.

< ma-name >：It is the name of build up maintance collection. 1～43 characters straing.It can be formed by letter, number, underline and the first and the last character cannot be underline.

number *< ma-num >*：The only number which label the MA in the maintance

domain. The range is 0~65535.

          < vlan-id >：Configure service primary vlan. The range is 1~4094.

Default: None.

Command Mode: Admin Mode.

Usage Guide: If the parameter is mac address, it will display all the outlying mep detail information which is using this mac address. If the parameter is mepid, then need to appoint the domain and the collection that is located.

Example: Display the appoint outlying MEP message on the switch, this MEP belongs to Domain_L5, maintance collection primary vlan as 5:

Switch#show ethernet cfm maintenance-points remote detail mepid 401 domain Domain_L5 vlan 5

Mac Address:00-03-0f-07-04-01

Domain Name:kk

Service Name:ma

Level:2

Vlan:1

Mepid:1

Incoming Port:Ethernet1/2

CC Send Interval:1(s)

Mep Port Status:Up

Receive Rdi:N

Field	Description
MAC Address	Outlying MEP mac address
Domain Name	Domain name
MA Name	The name of MA
Level	The level of the maintance collection
VLAN	The primary vlan of the maintance collection
MPID	Outlying MEPID
Sender Chassis ID	Sender id tlv fill in content
Incoming Port(s)	The local port which is receiving the messages from the outlying MEP
Cc send interval(ms)	The interval that sending cc from the outlying MEP
MEP interface status	The status of outlying MEP
Receive RDI	Whether RDI is sending

13.31 show ethernet cfm mpdb

Command: show ethernet cfm mpdb

Function: Display the content of MIP datebase.

Parameters: None.

Default: None.

Command Mode: Admin Mode.

Usage Guide: Display the content of MIP datebase.

Example: Display the content of MIP datebase.

Switch#show ethernet cfm mpdb

| Mac Address | Ingress | Vlan | Age |

00-03-0f-00-00-03   Ethernet1/4   Vlan1   0 (s)

Field	Description
MacAddress	The source mac addressIn CCM
Ingress	Entery port of CCM
Type Id	Fid and its value
Age	The upload and renewal time of Mip database distance

13.32 show ethernet cfm service

Command: show ethernet cfm service [domain < *domain-name* > [service { ma-name | number < *ma-num* > | pvlan < *vlan-id* > }]]

Function: Display the configured information of the maintance collection.

Parameters: < *domain-name* >： The maintance domain name.

< *ma-name* >： It is the name of build up maintance collection. 1～43 characters straing. It can be formed by letter, number, underline and the first and the last character cannot be underline.

number < *ma-num* >： The only number which label the MA in the maintance domain. The range is 0~65535.

< *vlan-id* >： Configure service primary vlan. The range is 1~4094.

Default: None.

Command Mode: Admin Mode.

Usage Guide: Display the configuration information in the maintance collection.

Notice: If the is no appoint domain, will display all the configured information in all

maintance collections and domains.

   If it is only appointed the domain but not maintance collection, then just display all the maintance collection in the the appointed domain.

Example: Display all the configured information of maintance collection in all domains.

Switch#show ethernet cfm service

Domain Name: test_ma

Level: 4

Service Name: 4

Active: 1

Primary Vlan: 1

Vlanlist: 1

Direction: Down

CC Send: Enable

CC Received: Enable

CC Interval: 1(s)

Meplist: 1-4094

Remote Mep: 2

Domain Name: test_ma

Level: 4

Service Name: 1

Active: 1

Primary Vlan: 2

Vlanlist: 2

Direction: Up

CC Send: Disable

CC Received: Disable

CC Interval: 1(s)

Field	Description
Domain Name	The domain name
Level	The level of maintance domain
Service Name	The name of maintance collection
Active	Whether the maintance collection is working
Primary Vlan	The related primary Vlan of maintance collection
Vlanlist	The related Vlan of maintance

	collection
Direction	The direction of maintance collection
CC Send	The sending function of CC in maintance collection
CC Received	The received function of CC in maintance collection
CC Interval	The interval of CC sending in maintance collection
Meplist: 1-4094	MEP table
Remote Mep	Outlying MEP

13.33 show ethernet cfm statistic

Command: show ethernet cfm statistic [domain < *domain-name* > [service { ma-name | number < *ma-num* > | pvlan < *vlan-id* > }]]

Function: Display the message sending statistics information in the CFM of the facility.

Parameters: < *domain-name* >： The maintance domain name.

    < *ma-name* >： It is the name of build up maintance collection. 1～43 characters straing.It can be formed by letter, number, underline and the first and the last character cannot be underline.

    number < *ma-num* >： The only number which label the MA in the maintance domain. The range is 0~65535.

    < *vlan-id* >： Configure service primary vlan. The range is 1~4094.

Default: None.

Command Mode: Admin Mode.

Usage Guide: Display the message sending statistics information in the CFM of the facility.

Example: Display the message sending statistics information in the CFM of the facility.

Switch#show ethernet cfm statistic

LB:

    SendLBM: 5   ReceiveLBM: 0

    SendLBR: 0   ReceiveLBR: 5

    ReceiveInOrderLBR: 5   ReceiveOutOrderLBR: 0   ErrorLBR: 0

LT:

    SendLTM: 0   ReceiveLTM: 0

    SendLTR: 0   ReceiveLTR: 0   ErrorLTR: 0

Domain Name: test_ma

Service Name: 4

Mepid: 1

CCM:

   SendCCM: 0   ReceivedCCM: 18162

   OutOfOrder: 0   Xcon: 24

   ErrorCCM: 0   MacStatusCCM: 0   RdiCCM: 18138

Field	Description
SendLBM	The number of sending LBM
ReceiveLBM	The number of receiving LBM
SendLBR	The number of sending BR
ReceiveLBR	The number of receiving BR
ReceiveInOrderLBR	The number of receive in order LBR
ReceiveOutOrderLBR	The number of receive out of order LBR
ErrorLBR	The number of receiving illegal LBR
SendLTM	The number of sending LTM
ReceiveLTM	The number of receiving LTM
SendLTR	The number of sending LRT
ReceiveLTR	The number of receiving LRT
ErrorLTR	The number of receiving illegal LTR
Domain Name	Domain name
Service Name	Maintance collection Name
Mepid	MEP Name
SendCCM	The number of sending CCM
ReceivedCCM	The number of receiving CCM
OutOfOrder	The number of out of order CCM
Xcon	The number of receiving cross CCM
ErrorCCM	The number of receiving illegal CCM
MacStatusCCM	The number of receiving mac status error CCM
RdiCCM	The number of CCM that is receiving RDI position 1

13.34 show ethernet cfm status

Command: show ethernet cfm status

Function: Display the status of CFM of the facility.

Parameters: None.

Default: None.

Command Mode: Admin Mode.

Usage Guide: Display the status of CFM of the facility.

Example: Display the status of CFM of the facility.

Switch#show ethernet cfm status

Ethernet cfm is enabled.

Y1731 global is enabled.

Field	Description
CFM is enabled.	Open the CFM function
CFM is disabled.	Do not open the CFM function
Y1731 global is enabled	Y1731 function has opened

13.35 show ethernet cfm traceroute-reply auto

Command: show ethernet cfm traceroute-reply auto [domain < *domain_name* > [service { ma-name | number < *ma-num* > | pvlan < *vlan-id* > }]]

Function: Display the result of the automatic LT.

Parameters: < *domain-name* >： The maintance domain name.

    < *ma-name* >： It is the name of build up maintance collection. 1～43 characters straing.It can be formed by letter, number, underline and the first and the last character cannot be underline.

    number < *ma-num* >： The only number which label the MA in the maintance domain. The range is 0~65535.

    < *vlan-id* >： Configure service primary vlan. The range is 1~4094.

Default: None.

Command Mode: Admin Mode.

Usage Guide: Display the received LTR content that is automatic saving LTM message.

Notice: If there is no appointed domain, then it will display all the automatic LT result in the facilities.

If there is no appointed ma, then it will display particular domain's automatic LT result in the facilities.

Example: Display all the result of the automatic LT.

Switch#show ethernet cfm traceroute-reply auto

Traceroute to MEP 606 with the sequence number 0,TTL 255.

Timeout is 5 seconds.Tracing the route to 00-03-0f-aa-22-23 on DOMAIN test_4 ,Level 4, Service:4

Traceroute sent via Ethernet1/1, path found via MPDB

I-----Intermedian Bridge

D----Target Destination

*-----Per hop Timeout

	MAC Address	TTL	Last MAC	Ingress/Egress Action	Relay Action
I	00-03-0f-00-00-03	254	00-03-0f-00-00-03	IngOK/EgrOK	FDB
D	00-03-0f-aa-22-23	253	00-03-0f-00-00-03	/EgrDown	Hit

Filed	Explanation
MAC Address	Source MAC address in LTR.
TTL	The number of hops that LTM passed by the device.
Last MAC	The MAC of the last hop of device that LTM packet passed by.
Ingress/Egress Action	The analyzed port status with Reply Ingress TLV and Reply Egress TLV.
Relay Action	It means whether the forwarding device found the target表示 MAC address in MAC address. Hit: this device is the target MAC address. FDB: have found the target MAC address in forwarding table.

13.36 show ethernet cfm vlan table

Command: show ethernet cfm vlan table

Function: Show the corresponding relationship of the configured pvlan and vlan on this device.

Parameters: None.

Default: None.

Command Mode: Admin Mode.

Usage Guide: Use **ethernet cfm pvlan *<1-4094>* vlan WORD** command to configure pvlan to associate with vlan, and then use this command to show the corresponding relationship of the configured pvlan and vlan on this device.

Example: Show the corresponding relationship of the configured pvlan and vlan on this device.

Switch(config))# show ethernet cfm vlan table

ethernet cfm vlan table:

pvlan 2 vlan 3-6

pvlan 7 vlan 8-10

13.37 switchport ulpp group <group-id> track cfm cc level <level-value>

Command: switchport ulpp group *<group-id>* track cfm cc level *<level-value>*

Function: Configure ulpp group member port to associate with cfm cc detection.

Parameters: *<group-id>*： ID information of ulpp group.

　　　　　***<level-value>*：** Associate with that the configured down mep of this level on the port detecting the cc error.

Default: Do not associate.

Command Mode: Port Mode.

Usage Guide: Configure the level information of the association of ulpp group member port and cfm cc detection. When ulpp group member port received the matching cfm information (timeout or recover), conduct the association.

Example: Configure the port of ulpp group1 to associate with the cc detection of down mep on level 1.

Switch(config-if-ethernet1/1)#switchport ulpp group 1 track cfm level 1

13.38 traceroute ethernet

Command: traceroute ethernet { target-mep *< target-mep-id >* | target-mac *< mac-address >* } {domain *< domain-name >* service { *< ma-name >* | number *< ma-num >* | pvlan *< vlan-id >* }} [fdb-only | source *< mepid >*]] [ttl *< ttl-value >*]

Function: Check the path from the appointed maintaining point to the target point.

Parameters: *< target-mep-id >*： The number of the target maintaining point of LTM packet;

　　　　　***< mac-address >*：** The target MAC address, the format if H-H-H;

　　　　　***< domain-name >*：** The maintaining domain name that the target MP belongs to.

　　　　　***< ma-name >*：** The name of the created maintaining set, with 1 to 43 characters.it ismade up by letters, numbers and underscores, the first and last character

cannot be the underscore.

number < *ma-num* >： It is the number which is only used to mark the MA,range is 0 to 65535.

< *vlan-id* >： Primary vlan of the configured service, range is 1 to 4094.

fdb-only： When finding the egress port, whether to inquiry the FDB table. If this value is not configured, it means that not only inquiry the FDB, and inquiry the MIP database.

source < *source-mepid* >： It is he id of MEP which is used to issue the LTM.

< *ttl-value* >： It is he number of hops that LTM can pass by, range is 1 to 255 and the default value is 64.

Default: ttl=64 and inquiry FDB and MIP database.

Command Mode: Admin Mode.

Usage Guide: CFM traceroute command is used to inquiry the the path from the appointed maintaining point to the target point. Through sending LTM packet to the target maintaining point and detecting the responsed LTR packet, ensure the path among the devices.

Example: Inquiry the path with mac of 00-03-0f-aa-22-23 in test_4.

Switch#traceroute ethernet target-mac 00-03-0f-aa-22-23 domain test_4 service 4

Traceroute with the sequence number 4,TTL 64.

Timeout is 5 seconds.Tracing the route to 00-03-0f-aa-22-23 on MD test_4, Level 4, Service:4

Traceroute sent via Ethernet1/4, path found via MPDB

I-----Intermedian Bridge

D----Target Destination

*-----Per hop Timeout

MAC Address	TTL	Last MAC	Ingress/Egress Action	Relay Action
D 00-03-0f-aa-22-23	63	00-03-0f-00-00-03	IngOK/	Hit

Field	Explanation
MAC Address	Source MAC address in LTR.
TTL	The number of hops that LTM passed by the device.
Last MAC	The MAC of the last hop of device that LTM packet passed by.
Ingress/Egress Action	The analyzed port status with Reply Ingress TLV and Reply Egress TLV.
Relay Action	It means whether the forwarding device found the target表示

	MAC address in MAC address.
	Hit: this device is the target MAC address.
	FDB: have found the target MAC address in forwarding table.

13.39 traceroute ethernet auto

Command: traceroute ethernet auto

           no traceroute ethernet auto

Function: Enable the function of sending the link track packets automatically.

Parameters: None.

Default: Disable.

Command Mode: MA Configuration Mode.

Usage Guide: Enable the function of sending the link track packets automatically. As default, this function is disabled.

Notice: After enabled this function, when the maintaining point does not receive the CCM packets from the distant point in 3.5 sending cycles of CCM packets, judge that the connection to the distant point is wrong, then send LTM packet (the target of this LTM packet is the distant maintaining point, the TTL field in LTM packet is the maximum value of 255) to locate the error through detecting the responsed LTR packet.

Example: Enable the function of sending the link track packets automatically.

Switch(config-ecfm-srv)#traceroute ethernet auto