HP 5120 EI Switch Series

Layer 2—LAN Switching

Command Reference

Contents

Ethernet interface configuration commands

broadcast-suppression

Syntax

broadcast-suppression { *ratio* | **pps** *max-pps* | **kbps** *max-kbps* }

undo broadcast-suppression

View

Ethernet interface view, port group view

Default level

2: System level

Parameters

ratio: Sets the broadcast suppression threshold as a percentage of the maximum interface rate, ranging from 1 to 100. The smaller the percentage, the less broadcast traffic is allowed to pass through.

pps *max-pps*: Specifies the maximum number of broadcast packets that the Ethernet interface can forward per second.

- For GE ports, the *max-pps* argument ranges from 1 to 1,488,100 pps.
- For 10-GE ports, the *max-pps* argument ranges from 1 to 14,881,000 pps.

kbps *max-kbps*: Specifies the maximum number of kilobits of broadcast traffic that the Ethernet interface can forward per second.

- For GE ports, the *max-kbps* argument ranges from 1 to 1,000,000 kbps.
- For 10-GE ports, the *max-kbps* argument ranges from 1 to 10,000,000 kbps.

Description

Use **broadcast-suppression** to set the broadcast suppression threshold on one or multiple Ethernet interfaces.

Use **undo broadcast-suppression** to restore the default.

By default, Ethernet interfaces do not suppress broadcast traffic.

If you execute this command in Ethernet interface view, the configuration takes effect only on the interface. If you execute this command in port group view, the configuration takes effect on all ports in the port group.

When you configure the broadcast suppression threshold in kbps, if the input value is less than 64, the value that takes effect is 64; if the input value is greater than 64 but is not a multiple of 64, the value that takes effect is a multiple of 64 greater than and nearest to the input value.

When broadcast traffic exceeds the broadcast suppression threshold, the system discards broadcast packets until the broadcast traffic drops below the threshold.

Examples

Set the broadcast suppression threshold to 20% on GigabitEthernet 1/0/1.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] broadcast-suppression 20
```

Set the broadcast suppression threshold to 20% on all ports in the manual port group named group1.

```
<Sysname> system-view
[Sysname] port-group manual group1
[Sysname-port-group-manual-group1] group-member gigabitethernet 1/0/1
[Sysname-port-group-manual-group1] group-member gigabitethernet 1/0/2
[Sysname-port-group-manual-group1] broadcast-suppression 20
```

Set the broadcast suppression threshold to 10000 kbps on GigabitEthernet 1/0/1.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] broadcast-suppression kbps 10000
Info: The actual value is 10048 on this port currently.
```

default

Syntax

default

View

Ethernet interface view

Default level

2: System level

Parameters

None

Description

Use **default** to restore the default settings for an Ethernet interface.

This command might fail to restore the default settings for some commands for reasons such as command dependencies and system restrictions. You can use the **display this** command in interface view to check for these commands, and perform their **undo** forms or follow the command reference to individually

restore their default settings. If your restoration attempt still fails, follow the error message to resolve the problem.

Examples

Restore the default settings for interface GigabitEthernet 1/0/1.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] default
This command will restore the default settings. Continue? [Y/N]:y
```

description

Syntax

description *text*

undo description

View

Ethernet interface view

Default level

2: System level

Parameters

text: Specifies the interface description, a string of 1 to 80 characters. The string can include case-sensitive letters, digits, special characters such as tilde (~), exclamation point (!), at sign (@), pound sign (#), dollar sign ($), percent sign (%), caret (^), ampersand sign (&), asterisk (*), left brace({), right brace (}), left parenthesis ((), right parenthesis ()), left bracket ([), right bracket (]), left angle bracket (<), right angle bracket (>), hyphen (-), underscore(_), plus sign (+), equal sign (=), vertical bar (|), back slash (\), colon (:), semi-colon (;) quotation marks ("), apostrophe ('), comma (,), dot (.), and slash (/), spaces, and other Unicode characters and symbols.

When you specify a description, follow these guidelines:

- Each Unicode character takes the space of two regular characters.
- To use Unicode characters or symbols in an interface description, install the specific input method editor and log in to the switch through remote login software that supports the character type.
- When the length of a description string reaches or exceeds the maximum line width on the terminal software, the software starts a new line, possibly breaking a Unicode character into two. As a result, garbled characters may be displayed at the end of a line.

Description

Use **description** to change the description of the interface.

Use **undo description** to restore the default.

The default description of an interface is the interface name plus **Interface**. For example, **GigabitEthernet1/0/1 Interface**.

Related commands: **display interface**.

Examples

Change the description of interface GigabitEthernet 1/0/1 to **lanswitch-interface**.

```
<Sysname> system-view
```

```
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] description lanswitch-interface
```

display counters

Syntax

display counters { **inbound** | **outbound** } **interface** [*interface-type*] [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

1: Monitor level

Parameters

inbound: Displays inbound traffic statistics.

outbound: Displays outbound traffic statistics.

interface-type: Specifies an interface type.

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display counters** to display traffic statistics for interfaces.

- If an interface type is specified, this command displays traffic statistics for all interfaces of the specified type.
- If no interface type is specified, this command displays traffic statistics for all interfaces that have traffic counters.

Examples

Display inbound traffic statistics for all GigabitEthernet interfaces.
```
<Sysname> display counters inbound interface gigabitethernet
Interface        Total(pkts)   Broadcast(pkts)   Multicast(pkts) Err(pkts)
GE1/0/1                 100               100                 0         0
GE1/0/2                   0                 0                 0         0
GE1/0/3            Overflow          Overflow          Overflow  Overflow
GE1/0/4                   0                 0                 0         0

 Overflow: more than 14 decimal digits(7 digits for column "Err").
       --: not supported.
```

Table 1 Command output

Field	Description
Interface	Abbreviated interface name.
Total (pkts)	Total number of packets received or sent through the interface.
Broadcast (pkts)	Total number of broadcast packets received or sent through the interface.
Multicast (pkts)	Total number of multicast packets received or sent through the interface.
Err (pkts)	Total number of error packets received or sent through the interface.
Overflow: more than 14 decimal digits(7 digits for column "Err").	The command displays **Overflow**, if any of the following applies: • The data length of an error statistic is greater than 7 decimal digits. • The data length of a non-error statistic is greater than 14 decimal digits.
--: not supported.	The statistical item is not supported.

display counters rate

Syntax

display counters rate { **inbound** | **outbound** } **interface** [*interface-type*] [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

1: Monitor level

Parameters

inbound: Displays inbound traffic rate statistics.

outbound: Displays outbound traffic rate statistics.

interface-type: Specifies an interface type.

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display counters rate** to display traffic rate statistics over the last sampling interval.

The statistics cover only interfaces in up state. If an interface type is specified, the command displays traffic rate statistics for all up interfaces of the specified type. If no interface type is specified, the command displays traffic rate statistics for all up interfaces that have traffic counters.

To set the statistics polling interval, use the **flow-interval** command. The default statistics polling interval is five minutes.

Related commands: **flow-interval**.

Display the inbound traffic rate statistics for all GigabitEthernet interfaces.
```
<Sysname> display counters rate inbound interface gigabitethernet
Interface          Total(pkts/sec)   Broadcast(pkts/sec)   Multicast(pkts/sec)
GE1/0/1                        0                   --                    --


Overflow: more than 14 decimal digits.
        --: not supported.
```

Table 2 Command output

Field	Description
Interface	Abbreviated interface name.
Total (pkts/sec)	Average rate (in packets per second) of receiving or sending packets during the sampling interval.
Broadcast (pkts/sec)	Average rate (packets per second) of receiving or sending broadcast packets during the sampling interval.
Multicast (pkts/sec)	Average rate (packets per second) of receiving or sending multicast packets during the sampling interval.
Overflow: more than 14 decimal digits.	The command displays **Overflow**, if any of the following applies: • The data length of an error statistic is greater than 7 decimal digits. • The data length of a non-error statistic is greater than 14 decimal digits.
--: not supported.	The statistical item is not supported.

display interface

Syntax

display interface [*interface-type*] [**brief** [**down**]] [**|** { **begin** | **exclude** | **include** } *regular-expression*]

display interface *interface-type interface-number* [**brief**] [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

1: Monitor level

Parameters

interface-type: Specifies an interface type.

interface-number: Specifies an interface number.

brief: Displays brief interface information. If you do not specify this keyword, the command displays detailed interface information.

down: Displays information about interfaces in down state and the causes. If you do not specify this keyword, this command displays information about interfaces in all states.

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display interface** to display Ethernet interface information.

If no interface type is specified, this command displays information about all interfaces.

If an interface type is specified but no interface number is specified, this command displays information about all interfaces of that type.

Related commands: **interface**.

Examples

Display detailed information about interface GigabitEthernet 1/0/1.

```
<Sysname> display interface gigabitethernet 1/0/1
GigabitEthernet1/0/1 current state: DOWN
 IP Packet Frame Type: PKTFMT_ETHNT_2, Hardware Address: 000f-e2d2-58fb
 Description: GigabitEthernet1/0/1 Interface
 Loopback is not set
 Media type is twisted pair
 Port hardware type is  1000_BASE_T
 1000Mbps-speed mode, unknown-duplex mode
 Link speed type is force link, link duplex type is autonegotiation
 Flow-control is enabled
 The Maximum Frame Length is 9216
 Broadcast MAX-ratio: 100%
 Unicast MAX-ratio: 100%
 Multicast MAX-ratio: 100%
 Allow jumbo frame to pass
 PVID: 1
 Mdi type: auto
 Port link-type: access
  Tagged   VLAN ID : none
  Untagged VLAN ID : 1
 Port priority: 0
 Last clearing of counters:  Never
 Peak value of input: 0 bytes/sec, at 2000-06-13 15:27:44
 Peak value of output: 0 bytes/sec, at 2000-06-13 15:27:44
 Last 300 seconds input:  0 packets/sec 0 bytes/sec 0%
 Last 300 seconds output:  0 packets/sec 0 bytes/sec 0%
 Input (total):  0 packets, 0 bytes
         0 unicasts, 0 broadcasts, 0 multicasts, 0 pauses
 Input (normal):  0 packets, - bytes
         0 unicasts, 0 broadcasts, 0 multicasts, 0 pauses
 Input:  0 input errors, 0 runts, 0 giants, 0 throttles
```

```
        0 CRC, 0 frame, - overruns, 0 aborts
        - ignored, - parity errors
Output (total): 0 packets, 0 bytes
        0 unicasts, 0 broadcasts, 0 multicasts, 0 pauses
Output (normal): 0 packets, - bytes
        0 unicasts, 0 broadcasts, 0 multicasts, 0 pauses
Output: 0 output errors, - underruns, - buffer failures
        0 aborts, 0 deferred, 0 collisions, 0 late collisions
        0 lost carrier, - no carrier
```

Table 3 Command output

Field	Description
GigabitEthernet1/0/1 current state	Physical state of the Ethernet interface. For more information, see Table 4.
IP Packet Frame Type	Ethernet framing format on the interface.
Hardware address	Hardware address of the port.
Description	Description of the interface.
Loopback is not set	The loopback testing function is disabled.
Unknown-speed mode	The port speed is unknown.
unknown-duplex mode	The duplex mode is unknown.
Link speed type is autonegotiation	The interface will negotiate a speed with its peer.
link duplex type is autonegotiation	The interface will negotiate a duplex mode with its peer.
The Maximum Frame Length	Maximum Ethernet frame length allowed on the interface.
Broadcast MAX-ratio	Broadcast suppression threshold as a percentage of the interface transmission capability. When the threshold is exceeded, the interface drops broadcast packets.
Unicast MAX-ratio	Unknown unicast suppression threshold as a percentage of the interface transmission capability. When the threshold is exceeded, the interface drops unknown unicast packets.
Multicast MAX-ratio	Multicast suppression threshold as a percentage of the interface transmission capability. When the threshold is exceeded, the interface drops multicast packets.
Allow jumbo frame to pass	Maximum length of Ethernet frames that are allowed to pass through the interface.
PVID	Port VLAN ID.
Mdi type	Cable type.
Port link-type	Link type of the interface, which could be access, trunk, or hybrid.
Tagged VLAN ID	VLANs for which the interface sends packets without removing VLAN tags.
Untagged VLAN ID	VLANs for which the interface sends packets after removing VLAN tags.
Last clearing of counters: Never	Time when the **reset counters interface** command was last used to clear statistics on the interface. **Never** indicates that the **reset counters interface** command was never used since the switch was started.

Field	Description
Peak value of input	Peak value of inbound traffic, in Bps.
Peak value of output	Peak value of outbound traffic, in Bps.
Last 300 seconds input: 0 packets/sec 0 bytes/sec Last 300 seconds output: 0 packets/sec 0 bytes/sec	Average rate of input and output traffic in the last 300 seconds, in pps and Bps.
Input (total): 0 packets, 0 bytes 0 unicasts, 0 broadcasts, 0 multicasts, 0 pauses	Inbound traffic statistics (in packets and bytes) for the interface. All inbound normal and abnormal packets (including unicast, broadcast, and multicast), and pause frames were counted.
Input (normal): 0 packets, - bytes 0 unicasts, 0 broadcasts, 0 multicasts, 0 pauses	Inbound traffic statistics (in packets and bytes) for the interface. All inbound normal packets (including unicast, broadcast, and multicast), and pause frames were counted.
input errors	Inbound packets with errors.
runts	Inbound frames shorter than 64 bytes, in correct format, and containing valid CRCs.
giants	Inbound frames larger than the maximum frame length supported on the interface. • For an Ethernet interface that does not permit jumbo frames, giants refer to frames larger than 1536 bytes (without VLAN tags) or 1540 bytes (with VLAN tags). • For an Ethernet interface that permits jumbo frames, giants refer to frames larger than the maximum length of Ethernet frames that are allowed to pass through, which is configured when you configure jumbo frame support on the interface.
- throttles	Number of times that the port shut down due to buffer or CPU overload.
frame	Total number of inbound frames that contained checksum errors and a non-integer number of bytes.
- overruns	Number of packet drops because the input rate of the port exceeded the queuing capability.

Field	Description
aborts	Total number of illegal inbound packets: • **Fragment frames**—CRC error frames shorter than 64 bytes. The length can be an integral or non-integral value. • **Jabber frames**—CRC error frames greater than the maximum frame length supported on the Ethernet interface (with an integral or non-integral length). For an Ethernet interface that does not permit jumbo frames, jabber frames refer to CRC error frames greater than 1518 bytes (without VLAN tags) or 1522 bytes (with VLAN tags). For an Ethernet interface that permits jumbo frames, jabber frames refer to CRC error frames greater than the maximum length of Ethernet frames that are allowed to pass through the interface (which is configured when you configure jumbo frame support on the interface). • **Symbol error frames**—Frames that contained at least one undefined symbol. • **Unknown operation code frames**—Non-pause MAC control frames • **Length error frames**—Frames whose 802.3 length fields did not accord with the actual frame length (46 to 1500 bytes).
ignored	Number of inbound frames dropped because the receive buffer of the port ran low.
- parity errors	Total number of frames with parity errors.
Output (total): 1502 packets, 138924 bytes - unicasts, 2 broadcasts, 406 multicasts, 0 pauses	Outbound traffic statistics (in packets and bytes) for the port. All outbound normal and abnormal packets (including unicast, broadcast, and multicast), and pause frames were counted.
Output (normal): - packets, - bytes 1094 unicasts, - broadcasts, - multicasts, - pauses	Outbound normal traffic (including unicast, broadcast, and multicast) and pause frame statistics (in packets and bytes) for the interface.
output errors	Outbound packets with errors.
- underruns	Number of packet drops because the output rate of the interface exceeded the output queuing capability. This is a low-probability hardware anomaly.
- buffer failures	Number of packets dropped because the transmit buffer of the interface ran low.
aborts	Number of packets that failed to be transmitted, for example, because of Ethernet collisions.
deferred	Number of frames that the interface deferred to transmit because of detected collisions.
collisions	Number of frames that the interface stopped transmitting because Ethernet collisions were detected during transmission.
late collisions	Number of frames that the interface deferred to transmit after transmitting their first 512 bits, because of detected collisions.
lost carrier	Number of carrier losses during transmission. This counter applies to serial WAN interfaces.

Field	Description
- no carrier	Number of times that the port failed to detect the carrier when attempting to send frames. This counter applies to serial WAN interfaces.

NOTE:

If an output field is not available, a hyphen (-) is displayed.

Table 4 Description on the possible physical states of a Ethernet interface

Field	Description
UP	The interface is physically up.
DOWN	The interface is physically down, because no physical connection exists. Possible reason: The network cable is disconnected or faulty.
DOWN (Administratively)	The interface is physically down, because it was shut down with the **shutdown** command. To restore its physical state, use the **undo shutdown** command.
DOWN (Link-Aggregation interface down)	The interface is physically down, because the aggregate interface corresponding to the aggregation group to which it belongs was shut down with the **shutdown** command.
DOWN (OAM connection failure)	The interface is physically down, because an OAM connection fails to be established on it or the OAM connection is disconnected.
DOWN (DLDP connection failure)	The interface is physically down, because a DLDP connection fails to be established on it or the DLDP connection is disconnected.
DOWN (Loopback detection-protected)	The interface is shut down, because a loop is detected on it.
DOWN (BPDU-protected)	The interface is shut down by the BPDU guard function.
DOWN (Monitor-Link uplink down)	The interface is physically down, because the uplink of the monitor link group to which it belongs is down.

Display brief information about all interfaces.

```
<Sysname> display interface brief
The brief information of interface(s) under route mode:
Link: ADM - administratively down; Stby - standby
Protocol: (s) - spoofing
Interface            Link Protocol Main IP        Description
NULL0                UP   UP(s)     --
Vlan1                UP   UP        192.168.0.85
Vlan2                DOWN DOWN      --
Vlan1010             DOWN DOWN      --

The brief information of interface(s) under bridge mode:
Link: ADM - administratively down; Stby - standby
Speed or Duplex: (a)/A - auto; H - half; F - full
Type: A - access; T - trunk; H - hybrid
Interface            Link Speed    Duplex Type PVID Description
BAGG1                DOWN auto     A      A    1
```

```
GE1/0/1                    DOWN 1G       A      A      1
GE1/0/2                    DOWN auto     A      A      1
GE1/0/3                    DOWN auto     A      A      1
GE1/0/4                    DOWN auto     A      A      1
GE1/0/5                    DOWN auto     A      A      1
GE1/0/6                    DOWN auto     A      A      1
GE1/0/7                    DOWN auto     A      A      1
GE1/0/8                    DOWN auto     A      A      1
GE1/0/9                    DOWN auto     A      A      1
GE1/0/10                   DOWN auto     A      A      1
```

Filter the brief interface information to display the line starting with the **(s)** string and all subsequent lines.

```
<Sysname>display interface brief | begin (s)
The brief information of interface(s) under route mode:
Link: ADM - administratively down; Stby - standby
Protocol: (s) - spoofing
Interface           Link Protocol Main IP        Description
NULL0               UP   UP(s)    --
RAGG1               DOWN DOWN     --
Vlan1               UP   UP       192.168.0.55
Vlan2               DOWN DOWN     --
```

Display the interfaces in down state and the reasons why they are down.

```
<Sysname> display interface brief down
The brief information of interface(s) under bridge mode:
Link: ADM - administratively down; Stby - standby
Interface           Link Cause
BAGG1               DOWN Not connected
GE1/0/1             DOWN Not connected
GE1/0/2             DOWN Not connected
GE1/0/4             DOWN Not connected
GE1/0/5             DOWN Not connected
```

Table 5 Command output

Field	Description
The brief information of interface(s) under route mode:	The command displays brief information about Layer 3 interfaces.
Link: ADM - administratively down; Stby - standby	Link layer state of the interface: • **ADM**—The interface has been shut down by the network administrator. To recover its physical layer state, perform the **undo shutdown** command. • **Stby**—The interface is a standby interface.
Protocol: (s) - spoofing	If the network layer protocol state of an interface is shown as UP, but its link is an on-demand link or not present at all, its protocol attribute includes the spoofing flag (an **s** in parentheses). This attribute is typical of interface Null 0 and the loopback interfaces.
Interface	Interface name.

Field	Description
Link	Physical link state of the interface: • **UP**—The link is up. • **DOWN**—The link is physically down. • **ADM**—The link has been administratively shut down. To recover its physical state, perform the **undo shutdown** command. • **Stby**—The interface is a standby interface.
Protocol	Protocol connection state of the interface, which can be UP, DOWN, or UP(s).
The brief information of interface(s) under bridge mode:	Brief information about Layer 2 interfaces.
Speed or Duplex: (a)/A - auto; H - half; F - full	If the speed of an interface is automatically negotiated, its speed attribute includes the auto negotiation flag, letter a in parentheses. If the duplex mode of an interface is automatically negotiated, its duplex mode attribute includes the following options: • **(a)/A**—Auto negotiation • **H**—Half negotiation • **F**—Full negotiation
Type: A - access; T - trunk; H – hybrid	Link type options for Ethernet interfaces.
Speed	Interface rate, in bps.
Duplex	Duplex mode of the interface: • **A**—Auto-negotiation • **F**—Full duplex • **F(a)**—Auto-negotiated full duplex • **H**—Half duplex • **H(a)**—Auto-negotiated half duplex
Type	Link type of the interface: • **A**—Access • **H**—Hybrid • **T**—Trunk
PVID	Port VLAN ID of the interface.
Cause	Causes for the physical state of an interface to be DOWN. For more information, see Table 6.

Table 6 Causes for the physical state of an interface to be DOWN

Field	Description
Not connected	No physical connection exists (possibly because the network cable is disconnected or faulty).
Administratively	The port was shut down with the **shutdown** command. To restore the physical state of the interface, use the **undo shutdown** command.
Link-Aggregation interface down	The aggregate interface corresponding to the aggregation group to which the interface belongs was shut down with the **shutdown** command.

Field	Description
OAM connection failure	OAM connection fails (possibly because the connection fails to be established or the connection is disconnected).
DLDP connection failure	DLDP connection fails (possibly because the connection fails to be established or the connection is disconnected).
Loopback detection-protected	The interface is shut down because a loop is detected on it.
BPDU-protected	The interface is shut down by the BPDU guard function.
Monitor-Link uplink down	The uplink of the monitor link group to which the interface belongs is down.

display loopback-detection

Syntax

display loopback-detection [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

1: Monitor level

Parameters

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display loopback-detection** to display the status of the loopback detection function.

If loopback detection is enabled, this command also displays the detection interval and ports in a loop condition.

Examples

Display information about loopback detection.

```
<Sysname> display loopback-detection
 Loopback detection is running.
 Loopback detection is in multi-port mode.
 Detection interval is 30 seconds.
 No port is detected with loopback.
```

Table 7 Command output

Field	Description
Loopback-detection is in multi-port mode.	Multi-port loopback detection is enabled. This field appears only when the switch supports the **loopback-detection multi-port-mode enable** command.
Detection interval time is 30 seconds.	Loopback detection interval is 30 seconds.
No port is detected with loopback.	No loops are detected on ports.

display packet-drop interface

Syntax

display packet-drop interface [*interface-type* [*interface-number*]] [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

1: Monitor level

Parameters

interface-type: Specifies an interface type.

interface-number: Specifies an interface number.

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display packet-drop interface** to display information about packets dropped on an interface or multiple interfaces.

- If you do not specify an interface type, this command displays information about dropped packets on all the interfaces on the switch.
- If you specify an interface type only, this command displays information about dropped packets on the specified type of interfaces.
- If you specify both the interface type and interface number, this command displays information about dropped packets on the specified interface.

Examples

Display information about dropped packets on GigabitEthernet 1/0/1.
```
<Sysname> display packet-drop interface gigabitethernet 1/0/1
GigabitEthernet1/0/1:
Packets dropped by GBP full or insufficient bandwidth: 301
```

```
Packets dropped by FFP: 261
Packets dropped by STP non-forwarding state: 321
```

Table 8 Command output

Field	Description
Packets dropped by GBP full or insufficient bandwidth	Packets that are dropped because the buffer is used up or the bandwidth is insufficient.
Packets dropped by FFP	Packets that are filtered out.
Packets dropped by STP non-forwarding state	Packets that are dropped because STP is in the non-forwarding state.

display packet-drop summary

Syntax

display packet-drop summary [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

1: Monitor level

Parameters

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display packet-drop summary** to display summary information about dropped packets on all interfaces.

Examples

Display information about dropped packets on all interfaces.

```
<Sysname> display packet-drop summary
All interfaces:
  Packets dropped by GBP full or insufficient bandwidth: 301
  Packets dropped by FFP: 261
  Packets dropped by STP non-forwarding state: 321
```

For the description of some fields in the output, see Table 8.

display port combo

display port combo [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

1: Monitor level

Parameters

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, which is a case-sensitive string of 1 to 256 characters.

Description

Use **display port combo** to display the combo interfaces of the switch and the fiber and copper combo ports.

Examples

Display the combo interfaces of the switch and the fiber and copper combo ports.

```
<Sysname> display port combo
Combo-group        Active                    Inactive
       1           GigabitEthernet1/0/46     GigabitEthernet1/0/49
       2           GigabitEthernet1/0/47     GigabitEthernet1/0/52
       3           GigabitEthernet1/0/48     GigabitEthernet1/0/50
       4           GigabitEthernet1/0/51     GigabitEthernet1/0/45
```

Table 9 Command output

Field	Description
Combo-group	Combo interfaces of the switch, represented by combo interface numbers that are generated by the system.
Active	Ports of the combo interfaces that are active.
Inactive	Ports of the combo interfaces that are inactive.

In a combo interface, the fiber or copper combo port with the smaller port number is active by default. You can determine whether a port is a fiber combo port or a copper combo port by checking the "Media type is" field of the **display interface** command.

display port-group manual

display port-group manual [**all** | **name** *port-group-name*] [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

2: System level

Parameters

all: Displays information about all port groups.

name *port-group-name*: Specifies the name of a port group, a string of 1 to 32 characters.

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display port-group manual** to display information about port groups.

If the **all** keyword is specified, this command displays the name and member Ethernet interfaces of each port group on the switch.

If a port group is specified, this command displays its name and member Ethernet interfaces.

If you do not specify the **all** keyword or any port group name, the command displays the name of each port group on the switch.

Examples

Display the names of all port groups.
```
<Sysname> display port-group manual
The following manual port group exist(s):
group1                              group2
```

Display detailed information about all port groups.
```
<Sysname> display port-group manual all
Member of group1:
    GigabitEthernet1/0/3        GigabitEthernet1/0/4        GigabitEthernet1/0/5
    GigabitEthernet1/0/6        GigabitEthernet1/0/7


Member of group2:
None
```

Display detailed information about the port group named group1.
```
<Sysname> display port-group manual name group1
```

```
Member of group1:
    GigabitEthernet1/0/3        GigabitEthernet1/0/4        GigabitEthernet1/0/5
    GigabitEthernet1/0/6        GigabitEthernet1/0/7
```

display storm-constrain

Syntax

display storm-constrain [**broadcast** | **multicast** | **unicast**] [**interface** *interface-type interface-number*]
[**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

1: Monitor level

Parameters

broadcast: Displays broadcast storm control settings and statistics.

multicast: Displays multicast storm control settings and statistics.

unicast: Displays unknown unicast storm control settings and statistics.

interface *interface-type interface-number*: Specifies an interface by its type and number with the *interface-type interface-number* argument.

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display storm-constrain** to display storm control settings and statistics.

If you specify no argument or keyword, this command displays all storm control settings on all storm control-enabled interfaces.

When the port forwarding state transition counter (Swi-num) reaches 65535, it automatically wraps back to 0.

Examples

Display the storm control settings on all storm control-enabled ports.
```
<Sysname> display storm-constrain
Abbreviation: BC - broadcast; MC - multicast; UC - unicast
 Flow Statistic Interval: 10(second)
PortName      Type LowerLimit UpperLimit CtrMode  Status  Trap Log SwiNum Unit
-----------------------------------------------------------------------------
GE1/0/30      MC   100        200        N/A      normal  on   on  0      kbps
```

Table 10 Command output

Field	Description
Flow Statistic Interval	Traffic polling interval of the storm control module.
PortName	Abbreviated port name.
StormType	Type of traffic subjected to storm control. Options include broadcast, multicast and unknown unicast.
LowerLimit	Lower storm control threshold, in pps, kbps, or percentage.
UpperLimit	Upper storm control threshold, in pps, kbps, or percentage.
Ctrmode	Protective action (block or shutdown) taken on the port when the upper threshold is reached. If you have not configured any protective action, N/A is displayed.
Status	Packet forwarding status: • **Normal**—The port is forwarding traffic normally. • **Control**—The port is in controlled mode.
Trap	Status of the storm control threshold event trap switch: • **On**—The port sends threshold event traps. • **Off**—The port does not send threshold event traps.
Log	Status of the storm control threshold event log switch: • **On**—The port sends threshold event log messages. • **Off**—The port does not send threshold event log messages.
Swi-num	Number of times the forwarding state of the interface changes. When the **Swi-num** count reaches 65,535, it resets automatically.

duplex

Syntax

duplex { **auto** | **full** | **half** }

undo duplex

View

Ethernet interface view

Default level

2: System level

Parameters

auto: Sets the interface to operate in auto-negotiation mode.

full: Sets the interface to operate in full duplex mode.

half: Sets the interface to operate in half duplex mode. This keyword is not available for Ethernet copper ports that are configured with a 1000-Mbps port speed and fiber ports.

Description

Use **duplex** to set the duplex mode for an Ethernet interface.

Use **undo duplex** to restore the default duplex mode of the Ethernet interface.

By default, Ethernet interfaces operate in auto-negotiation mode.

Related commands: **speed**.

Examples

Configure the interface GigabitEthernet 1/0/1 to operate in full duplex mode.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] duplex full
```

flow-control

Syntax

flow-control

undo flow-control

View

Ethernet interface view

Default level

2: System level

Parameters

None

Description

Use **flow-control** to enable TxRx mode generic flow control on an Ethernet interface.

Use **undo flow-control** to disable generic flow control on the Ethernet interface.

TxRx mode flow control enables an Ethernet interface to receive common pause frames from its peer, and send common pause frames to notify its peer of congestions.

By default, generic flow control on an Ethernet interface is disabled.

With the **flow-control** command configured, an interface can both send and receive flow control frames:

- When congested, the interface sends a flow control frame to its peer.
- Upon receiving a flow control frame from the peer, the interface suspends sending packets.

To implement flow control on a link, you must enable the generic flow control function at both ends of the link.

Examples

Enable TxRx mode generic flow control on the interface GigabitEthernet1/0/1.

```
<Sysname> system-view
[Sysname] interface GigabitEthernet 1/0/1
[Sysname-GigabitEthernet1/0/1] flow-control
```

flow-control receive enable

flow-control receive enable

undo flow-control

View

Ethernet interface view

Default level

2: System level

Parameters

None

Description

Use **flow-control receive enable** to enable Rx mode generic flow control on an Ethernet port.

Use **undo flow-control** to disable generic flow control on an Ethernet interface.

Rx mode generic flow control enables an Ethernet interface to receive and process common pause frames from its peer. The interface does not send common pause frames when it is congested.

By default, Rx flow control is disabled on Ethernet interfaces.

With the **flow-control receive enable** command configured, an interface can receive, but not send flow control frames. When the interface receives a flow control frame from its peer, it suspends sending packets to the peer. When traffic congestion occurs on the interface, it cannot send flow control frames to the peer.

To handle unidirectional traffic congestion on a link, configure the **flow-control receive enable** command at one end, and the **flow-control** command at the other. To enable both ends of the link to handle traffic congestion, configure the **flow-control** command at both ends.

Examples

Enable Rx mode generic flow control on GigabitEthernet1/0/1.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] flow-control receive enable
```

flow-interval

Syntax

flow-interval *interval*

undo flow-interval

View

Ethernet interface view

Default level

2: System level

Parameters

interval: Sets the statistics polling interval, in seconds. It ranges from 5 to 300 and must be a multiple of 5.

Description

Use **flow-interval** to set the interface statistics polling interval.

Use **undo flow-interval** to restore the default interval.

In system view, use the **flow-interval** command to set the statistics polling interval for all interfaces.

In Ethernet interface view, use the **flow-interval** command to set the statistics polling interval for the interface.

Examples

Set the statistics polling interval to 100 seconds on GigabitEthernet 1/0/1.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] flow-interval 100
```

group-member

Syntax

group-member *interface-list*

undo group-member *interface-list*

View

Port group view

Default level

2: System level

Parameters

interface-list: Specifies an Ethernet interface list, in the form of *interface-type interface-number* [**to** *interface-type interface-number*] &<1-10>, where &<1-10> indicates that you can specify up to 10 interfaces or interface ranges.

Description

Use **group-member** to assign Ethernet interfaces to a port group.

Use **undo group-member** to remove Ethernet interfaces from the port group.

By default, a port group does not contain any member ports.

If you use the **group-member** *interface-type interface-start-number* **to** *interface-type interface-end-number* command to add multiple ports in batch to the specified port group, make sure that the *interface-end-number* argument must be greater than the *interface-start-number* argument.

Examples

Assign Ethernet interface GigabitEthernet 1/0/1 to the port group named group1.

```
<Sysname> system-view
[Sysname] port-group manual group1
[Sysname-port-group-manual-group1] group-member gigabitethernet 1/0/1
```

interface

Syntax

interface *interface-type interface-number*

View

System view

Default level

2: System level

Parameters

interface-type interface-number: Specifies an interface type and number.

Description

Use **interface** to enter interface view.

Examples

Enter GigabitEthernet 1/0/1 interface view (assuming that the interface is an Ethernet interface).

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1]
```

jumboframe enable

Syntax

jumboframe enable [*value*]

undo jumboframe enable

View

Ethernet interface view, port group view

Default level

2: System level

Parameters

value: Sets the maximum length of Ethernet frames that are allowed to pass through, ranging from 1536 to 9216 bytes. If you set the *value* argument multiple times, the latest configuration takes effect.

Description

Use **jumboframe enable** to allow jumbo frames within the specified length to pass through one or multiple Ethernet interfaces.

Use **undo jumboframe enable** to prevent jumbo frames from passing through one or multiple Ethernet interfaces.

By default, the switch allows jumbo frames within 9216 bytes to pass through Ethernet interfaces.

In Ethernet interface view, the command applies only to the current Ethernet interface.

In port group view, the command applies to every Ethernet interface in the port group.

Examples

Configure the switch to allow jumbo frames within 9216 bytes to pass through GigabitEthernet 1/0/1.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] jumboframe enable
```

link-delay

Syntax

link-delay *delay-time*

undo link-delay

View

Ethernet interface view

Default level

2: System level

Parameters

delay-time: Sets the physical state change suppression interval on the Ethernet interface, ranging from 2 to 10 seconds.

Description

Use **link-delay** to set the physical state change suppression interval on an Ethernet interface.

Use **undo link-delay** to restore the default.

By default, the physical state change suppression interval on an Ethernet interface is 0 seconds.

Do not use this command on Ethernet interfaces with RRPP, MSTP, or Smart Link enabled.

> NOTE:
> This command does not apply to ports that are administratively shut down (with the **shutdown** command).

Examples

Enable physical state change suppression on GigabitEthernet 1/0/1, setting the suppression interval to 8 seconds.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] link-delay 8
```

link-delay mode up

Syntax

link-delay *delay-time* **mode up**

undo link-delay

View

Ethernet interface view

Default level

2: System level

Parameters

delay-time: Sets the link down suppression interval, ranging from 2 to 10 seconds.

Description

Use **link-delay** *delay-time* **mode up** to enable an Ethernet interface to suppress link down events. When the physical link of the interface goes down, the interface suppresses the link down event and starts a timer. When the timer expires, the physical layer reports the event to the upper layers.

Use **undo link-delay** to restore the default.

By default, the link down suppression interval on an Ethernet interface is 0 seconds.

The **link-delay mode up** command and the **link-delay** command supersede each other. The command that is configured last takes effect.

Do not configure this command on ports with RRPP, MSTP, or Smart Link enabled.

Examples

Enable link down suppression on GigabitEthernet 1/0/1, setting the suppression interval to 10 seconds.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] link-delay 10 mode up
```

loopback

Syntax

loopback { **external** | **internal** }

View

Ethernet interface view

Default level

2: System level

Parameters

external: Enables external loopback testing to test all on-chip functions related to Ethernet interfaces.

internal: Enables internal loopback testing to test the hardware of Ethernet interfaces.

Description

Use **loopback** to enable loopback testing on an Ethernet interface.

By default, loopback testing is disabled on Ethernet interfaces.

Enable loopback testing for troubleshooting purposes, such as identifying an Ethernet problem.

During loopback testing, the **speed**, **duplex**, **mdi**, and **shutdown** commands are not available. In addition, the port is operating in full duplex mode, regardless of its duplex configuration. After loopback testing is disabled, the duplex configuration of the port is restored.

Loopback testing is a one-time operation, and is not recorded in the configuration file.

Enable internal loopback testing on GigabitEthernet 1/0/1.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] loopback internal
 Loop internal succeeded!
```

loopback-detection action

Syntax

loopback-detection action { **no-learning** | **semi-block** | **shutdown** }

undo loopback-detection action

View

Ethernet interface view, port group view

Default level

2: System level

Parameters

no-learning: Disables MAC address learning on the interface.

semi-block: Blocks all packets but STP BPDUs, and disables MAC address learning on the interface.

shutdown: Shuts down the Ethernet interface. To bring up the interface again, use the **undo shutdown** command.

Description

Use **loopback-detection action** to configure the action for loop protection on Ethernet interfaces.

Use **undo loopback-detection action** to restore the default.

By default, a looped interface drops the incoming packets and correctly sends packets; the system generates traps and log messages, and deletes the MAC address table entries of the looped interface.

When you change the link type of an Ethernet interface by using the **port link-type** command, the switch removes the protective action configured on the interface. For more information about the **port link-type** command, see "VLAN configuration commands."

Examples

Configure the access port GigabitEthernet 1/0/1 to shut down when a loop is detected.

```
<Sysname> system-view
[Sysname] loopback-detection enable
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] loopback-detection enable
[Sysname-GigabitEthernet1/0/1] loopback-detection action shutdown
```

Configure the trunk port GigabitEthernet 1/0/2 to shut down when a loop is detected.

```
<Sysname> system-view
[Sysname] loopback-detection enable
[Sysname] interface gigabitethernet 1/0/2
[Sysname-GigabitEthernet1/0/2] port link-type trunk
[Sysname-GigabitEthernet1/0/2] loopback-detection enable
```

```
[Sysname-GigabitEthernet1/0/2] loopback-detection control enable
[Sysname-GigabitEthernet1/0/2] loopback-detection action shutdown
```

loopback-detection control enable

Syntax

loopback-detection control enable

undo loopback-detection control enable

View

Ethernet interface view, port group view

Default level

2: System level

Parameters

None

Description

Use **loopback-detection control enable** to enable loopback detection control on trunk or hybrid ports.

Use **undo loopback-detection control enable** to restore the default.

By default, loopback detection control is disabled on trunk and hybrid ports.

When a hybrid or trunk port detects a loop condition, it sends traps, whether loopback detection control is enabled or not. However, only after loopback detection control is enabled will the port perform the protective action configured with the **loopback-detection action** command.

This command is not applicable to access ports.

Examples

Enable loopback detection control on the trunk port GigabitEthernet 1/0/1.

```
<Sysname> system-view
[Sysname] loopback-detection enable
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] port link-type trunk
[Sysname-GigabitEthernet1/0/1] loopback-detection enable
[Sysname-GigabitEthernet1/0/1] loopback-detection control enable
```

loopback-detection enable

Syntax

loopback-detection enable

undo loopback-detection enable

View

System view, Ethernet interface view, port group view

Default level

2: System level

Parameters

None

Description

Use **loopback-detection enable** to enable loopback detection globally in system view or on interfaces in Ethernet interface or port group view. To use loopback detection on an Ethernet interface, you must enable the function both globally and on the port.

Use **undo loopback-detection enable** to disable loopback detection globally or on Ethernet interfaces.

The **undo loopback-detection enable** command in system view disables loopback detection on all interfaces.

By default, loopback detection is disabled on all Ethernet interfaces.

If an interface receives a packet that it sent out, a loop has occurred. Loops may cause broadcast storms, which degrade network performance. You can enable loopback detection to detect loops on an interface and, if the interface supports the **loopback-detection action** command, configure the protective action (shut down the port, for example) to take on the interface when a loop is detected.

In addition to the configured protective action, the switch also performs other actions to alleviate the impact of the loop condition. For more information, see Table 11.

Table 11 Actions to take upon detection of a loop condition

Port type	Actions	
	No protective action is configured	**A protective action is configured**
Access port	• Place the interface in controlled mode. The interface does not receive or send packets. • Generate traps. • Delete all MAC address entries of the interface.	• Perform the configured protective action. • Generate traps and log messages. • Delete all MAC address entries of the interface.
Hybrid or trunk port	• Generate traps. • If loopback detection control is enabled, set the interface in controlled mode. The interface does not receive or send packets. • Delete all MAC address entries of the interface.	• Generate traps and log messages. • If loopback detection control is enabled, take the configured protective action on the interface. • Delete all MAC address entries of the interface.

Related commands: **loopback-detection control enable**.

Examples

Enable loopback detection on GigabitEthernet 1/0/1.

```
<Sysname> system-view
[Sysname] loopback-detection enable
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] loopback-detection enable
```

loopback-detection interval-time

Syntax

loopback-detection interval-time *time*

undo loopback-detection interval-time

View

System view

Default level

2: System level

Parameters

time: Sets the loopback detection interval, ranging from 5 to 300 seconds.

Description

Use **loopback-detection interval-time** to set the loopback detection interval.

Use **undo loopback-detection interval-time** to restore the default loopback detection interval.

The default loopback detection interval is 30 seconds.

Related commands: **display loopback-detection**.

Examples

Set the loopback detection interval to 10 seconds.

```
<Sysname> system-view
[Sysname] loopback-detection interval-time 10
```

loopback-detection multi-port-mode enable

Syntax

loopback-detection multi-port-mode enable

undo loopback-detection multi-port-mode enable

View

System view

Default level

2: System level

Parameters

None

Description

Use **loopback-detection multi-port-mode enable** to enable multi-port loopback detection.

Use **undo loopback-detection multi-port-mode enable** to restore the default.

By default, multi-port loopback detection is disabled.

When detecting a loop between two interfaces, the switch takes the following actions on the looped interface:

- If the looped interface is an access interface, the switch performs the configured protective action, sends traps to the terminals, and deletes all MAC address entries of the interface.
- If the looped interface is a trunk or hybrid interface, the switch sends traps to the terminals. If loopback detection control is enabled, the switch performs the configured protection action on the looped interface and deletes all MAC address entries of the interface.

To enable multi-port loopback detection, you must configure the **loopback-detection multi-port-mode enable** and **loopback-detection enable** commands in system view, and configure the **loopback-detection enable** command in the view of the related interfaces.

Examples

Enable multi-port loopback detection to monitor loops between GigabitEthernet 1/0/1 and GigabitEthernet 1/0/2.

```
<Sysname> system-view
[Sysname] loopback-detection enable
[Sysname] loopback-detection multi-port-mode enable
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] loopback-detection enable
[Sysname-GigabitEthernet1/0/1] quit
[Sysname] interface gigabitethernet 1/0/2
[Sysname-GigabitEthernet1/0/2] loopback-detection enable
```

loopback-detection per-vlan enable

Syntax

loopback-detection per-vlan enable

undo loopback-detection per-vlan enable

View

Ethernet interface view, port group view

Default level

2: System level

Parameters

None

Description

Use **loopback-detection per-vlan enable** to enable loopback detection in each VLAN on trunk or hybrid ports.

Use **undo loopback-detection per-vlan enable** to disable loopback detection in all but the PVID on trunk or hybrid ports.

By default, a trunk port or hybrid port performs loopback detection only in its PVID.

The **loopback-detection per-vlan enable** command is not applicable to access ports.

Examples

Enable loopback detection in all VLANs on hybrid port GigabitEthernet 1/0/1.

```
<Sysname> system-view
[Sysname] loopback-detection enable
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] loopback-detection enable
[Sysname-GigabitEthernet1/0/1] port link-type trunk
[Sysname-GigabitEthernet1/0/1] loopback-detection per-vlan enable
```

mdi

Syntax

mdi { **across** | **auto** | **normal** }

undo mdi

View

Ethernet interface view

Default level

2: System level

Parameters

across: Sets the MDI mode to across. In this mode, pins 1 and 2 of the port are receive pins, and pins 3 and 6 are transmit pins.

auto: Sets the MDI mode to auto. In this mode, the port negotiates pin roles with its peer.

normal: Sets the MDI mode to normal. In normal mode, pins 1 and 2 of the port are transmit pins, and pins 3 and 6 are receive pins.

Description

Use **mdi** to configure the MDI mode of a copper Ethernet interface.

Use **undo mdi** to restore the default.

By default, Ethernet interfaces operate in auto MDI mode.

> NOTE:
> This command is not applicable to fiber ports.

Examples

Set GigabitEthernet 1/0/1 to operate in across MDI mode.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] mdi across
```

multicast-suppression

multicast-suppression { *ratio* | **pps** *max-pps* | **kbps** *max-kbps* }

undo multicast-suppression

View

Ethernet interface view, port group view

Default level

2: System level

Parameters

ratio: Sets the multicast suppression threshold as a percentage of the maximum interface rate, ranging from 1 to 100. The smaller the percentage, the less multicast traffic is allowed to pass through.

pps *max-pps*: Specifies the maximum number of multicast packets that the Ethernet interface can forward per second.

- For GE ports, the *max-pps* argument ranges from 1 to 1,488,100 pps.
- For 10-GE ports, the *max-pps* argument ranges from 1 to 14,881,000 pps.

kbps *max-kbps*: Specifies the maximum number of kilobits of multicast traffic that the Ethernet interface can forward per second.

- For GE ports, the *max-kbps* argument ranges from 1 to 1,000,000 kbps.
- For 10-GE ports, the *max-kbps* argument ranges from 1 to 10,000,000 kbps.

Description

Use **multicast-suppression** to set the multicast suppression threshold on one or multiple Ethernet interfaces.

Use **undo multicast-suppression** to restore the default.

By default, Ethernet interfaces do not suppress multicast traffic.

If you execute this command in Ethernet interface view, the configurations take effect only on the interface. If you execute this command in port group view, the configurations take effect on all ports in the port group.

When you configure the multicast suppression threshold in kbps, if the input value is less than 64, the value that takes effect is 64; if the input value is greater than 64 but is not a multiple of 64, the value that takes effect is a multiple of 64 greater than and nearest to the input value.

When multicast traffic exceeds the threshold you configure, the system discards multicast packets until the multicast traffic drops below the threshold.

NOTE:

- If you set different multicast suppression thresholds in Ethernet interface view or port group view multiple times, the one configured last takes effect.
- For a particular type of traffic, configure either storm suppression or storm control, but not both. If both of them are configured, you may fail to achieve the expected storm control effect.

Examples

\# Set the multicast threshold to 20% on GigabitEthernet 1/0/1.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] multicast-suppression 20
```

\# Set the multicast threshold to 20% on all ports in the port group named group1.

```
<Sysname> system-view
[Sysname] port-group manual group1
[Sysname-port-group-manual-group1] group-member gigabitethernet 1/0/1
[Sysname-port-group-manual-group1] group-member gigabitethernet 1/0/2
[Sysname-port-group-manual-group1] multicast-suppression 20
```

\# Set the multicast suppression threshold to 10000 kbps on GigabitEthernet 1/0/1.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] multicast-suppression kbps 10000
Info: The actual value is 10048 on this port currently.
```

port auto-power-down

Syntax

port auto-power-down

undo port auto-power-down

View

Ethernet interface view, port group view

Default level

2: System level

Parameters

None

Description

Use **port auto-power-down** to enable auto power-down on Ethernet interfaces for energy efficiency.

Use **undo port auto-power-down** to restore the default.

By default, auto power-down is disabled on Ethernet interfaces.

Examples

\# Enable auto power-down on GigabitEthernet 1/0/1.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] port auto-power-down
```

\# Enable auto power-down on all member ports of port group **group1**.

```
<Sysname> system-view
[Sysname] port-group manual group1
[Sysname-port-group-manual-group1] group-member gigabitethernet 1/0/1
[Sysname-port-group-manual-group1] group-member gigabitethernet 1/0/2
[Sysname-port-group-manual-group1] port auto-power-down
```

port bridge enable

Syntax

port bridge enable

undo port bridge enable

View

Ethernet interface view

Default level

2: System level

Parameters

None

Description

Use **port bridge enable** to enable bridging on a Ethernet interface.

Use **undo port bridge enable** to disable bridging on the Ethernet interface.

By default, bridging is not enabled on Ethernet interfaces.

Examples

Enable bridging on Ethernet interface GigabitEthernet 1/0/1.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] port bridge enable
```

port-group manual

Syntax

port-group manual *port-group-name*

undo port-group manual *port-group-name*

View

System view

Default level

2: System level

Parameters

port-group-name: Sets the port group name, a string of 1 to 32 characters.

Description

Use **port-group manual** to create a port group and enter port group view.

Use **undo port-group manual** to remove a port group.

By default, no port group exists.

Examples

Create port group **group1**.

```
<Sysname> system-view
[Sysname] port-group manual group1
[Sysname-port-group-manual-group1]
```

reset counters interface

Syntax

reset counters interface [*interface-type* [*interface-number*]]

View

User view

Default level

2: System level

Parameters

interface-type: Specifies an interface type.

interface-number: Specifies an interface number.

Description

Use **reset counters interface** to clear the Ethernet interface statistics.

Before collecting traffic statistics for a specific period of time on an interface, clear the old statistics first.

- If no interface type is specified, this command clears statistics for all interfaces.
- If only the interface type is specified, this command clears statistics for all interfaces of that type.

Examples

Clear the statistics of GigabitEthernet 1/0/1.

```
<Sysname> reset counters interface gigabitethernet 1/0/1
```

reset packet-drop interface

Syntax

reset packet-drop interface [*interface-type* [*interface-number*]]

View

Any view

Default level

2: System level

Parameters

interface-type: Specify an interface type.

interface-number: Specify an interface number.

Description

Use **reset packet-drop interface** to clear statistics of dropped packets on an interface or multiple interfaces.

Sometimes you need to clear the old statistics before you can collect statistics of dropped packets.

- If you do not specify an interface type, this command clears statistics of dropped packets on all the interfaces on the switch.
- If you specify an interface type only, this command clears statistics of dropped packets on the specified type of interfaces.
- If you specify both the interface type and interface number, this command clears statistics of dropped packets on the specified interface.

Examples

Clear statistics of dropped packets on GigabitEthernet 1/0/1.

```
<Sysname> reset packet-drop interface gigabitethernet 1/0/1
```

Clear statistics of dropped packets on all interfaces.

```
<Sysname> reset packet-drop interface
```

shutdown

Syntax

shutdown

undo shutdown

View

Ethernet interface view, port group view

Default level

2: System level

Parameters

None

Description

⚠ CAUTION:

After you shut down an Ethernet interface with this command, it cannot forward packets, even if it is physically connected.

Use **shutdown** to shut down an Ethernet interface.

Use **undo shutdown** to bring up an Ethernet interface.

By default, an Ethernet interface is in up state.

Examples

Shut down and then bring up GigabitEthernet 1/0/1.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] shutdown
[Sysname-GigabitEthernet1/0/1] undo shutdown
```

Shut down all member ports in the port group named group1.

```
<Sysname> system-view
[Sysname] port-group manual group1
[Sysname-port-group-manual-group1] shutdown
```

speed

Syntax

speed { **10** | **100** | **1000** | **auto** }

undo speed

View

Ethernet interface view

Default level

2: System level

37

Parameters

10: Sets the interface speed to 10 Mbps.

100: Sets the interface speed to 100 Mbps.

1000: Sets the interface speed to 1000 Mbps.

auto: Enables the interface to negotiate a speed with its peer.

Description

Use **speed** to set the speed of an Ethernet interface.

Use **undo speed** to restore the default.

By default, an Ethernet interface automatically negotiates a speed with the peer.

For an Ethernet copper port, use the **speed** command to set its speed to match the speed of the peer interface.

For a fiber port, use the **speed** command to set its speed to match the rate of a pluggable transceiver.

Related commands: **duplex** and **speed auto**.

> NOTE:
> GE fiber ports do not support the **10** or **100** keyword. 10-GE fiber ports do not support this command.

Examples

\# Configure GigabitEthernet 1/0/1 to operate at 100 Mbps.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] speed 100
```

speed auto

Syntax

speed auto { **10** | **100** | **1000** } *

undo speed

View

GE interface view

Default level

2: System level

Parameters

10: Sets 10 Mbps as an option for speed auto negotiation.

100: Sets 100 Mbps as an option for speed auto negotiation.

1000: Sets 1000 Mbps as an option for speed auto negotiation.

Description

Use **speed auto** to set options for speed auto negotiation.

Use **undo speed** to restore the default.

By default, an Ethernet interface automatically negotiates a speed with the peer.

The **speed** command and the **speed auto** command supersede each other. The command that is configured last takes effect.

If you configure **speed 100** after configuring **speed auto 100 1000** on an interface, the interface speed is set to 100 Mbps by force without negotiation. If you configure **speed auto 100 1000** after configuring **speed 100** on the interface, the interface negotiates with its peer, and the negotiated speed is either 100 Mbps or 1000 Mbps.

To avoid negotiation failure, make sure that at least one speed option is supported at both ends.

NOTE:
This feature is supported only on Gigabit copper ports that support speed auto negotiation.

Examples

Configure the port GigabitEthernet 1/0/1 to use 10 Mbps and 1000 Mbps for speed negotiation.
```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] speed auto 10 1000
```

storm-constrain

Syntax

storm-constrain { **broadcast** | **multicast** | **unicast** } { **pps** | **kbps** | **ratio** } *max-values min-values*

undo storm-constrain { **all** | **broadcast** | **multicast** | **unicast** }

View

Ethernet interface view

Default level

2: System level

Parameters

all: Disables storm control for all types of packets: broadcast, multicast, and unknown unicast.

broadcast: Enables or disables broadcast storm control.

multicast: Enables or disables multicast storm control.

unicast: Enables or disables unknown unicast storm control.

pps: Sets storm control thresholds in pps.

kbps: Sets storm control thresholds in kbps.

ratio: Sets storm control thresholds as a percentage of the transmission capacity of the interface.

max-values: Sets the upper threshold.

min-values: Sets the lower threshold, ranging from 1 to *max-values*.

Description

Use **storm-constrain** to enable broadcast, multicast, or unknown unicast storm control on an Ethernet port.

Use **undo storm-constrain** to disable storm control.

By default, traffic storm control is disabled.

To achieve desirable storm protection effect, avoid configuring both the **storm-constrain** command and any storm suppression command (**unicast-suppression**, **multicast-suppression**, and **broadcast-suppression**) on a port.

An upper threshold must be greater than or equal to the corresponding lower threshold. HP does not recommend configuring the same value for the two thresholds.

Examples

Enable unknown unicast storm control on GigabitEthernet 1/0/1, setting the upper and lower thresholds to 200 pps and 150 pps.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] storm-constrain unicast pps 200 150
```

Enable broadcast storm control on GigabitEthernet 1/0/2, setting the upper and lower thresholds to 2000 kbps and 1500 kbps.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/2
[Sysname-GigabitEthernet1/0/2] storm-constrain broadcast kbps 2000 1500
```

Enable multicast storm control on GigabitEthernet 1/0/3, setting the upper and lower thresholds to 80% and 15%.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/3
[Sysname-GigabitEthernet1/0/3] storm-constrain multicast ratio 80 15
```

storm-constrain control

Syntax

storm-constrain control { **block** | **shutdown** }

undo storm-constrain control

View

Ethernet interface view

Default level

2: System level

Parameters

block: Blocks this type of traffic, while forwarding other types of traffic. Even though the interface does not forward the blocked traffic, it still counts the traffic. When the blocked traffic is detected dropping below the lower threshold, the port begins to forward the traffic.

shutdown: Shuts down automatically. The interface shuts down automatically and stops forwarding any traffic. When the blocked traffic is detected dropping below the lower threshold, the port does not forward the traffic. To bring up the interface, perform the **undo shutdown** command or disable the storm control function.

Description

Use **storm-constrain control** to set the protective action to take on an Ethernet interface when a type of traffic (unknown unicast, multicast, or broadcast) exceeds the upper storm control threshold.

Use **undo storm-constrain control** to restore the default.

By default, no action is taken on an Ethernet interface when a type of traffic exceeds the upper storm control threshold.

Examples

Configure GigabitEthernet 1/0/1 to block the traffic detected crossing the upper storm control threshold.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] storm-constrain control block
```

storm-constrain enable log

Syntax

storm-constrain enable log

undo storm-constrain enable log

View

Ethernet interface view

Default level

2: System level

Parameters

None

Description

Use **storm-constrain enable log** to enable an Ethernet interface to log storm control threshold events. Logged events include traffic exceeding the upper threshold and traffic falling below the lower threshold from the upper threshold.

Use **undo storm-constrain enable log** to disable log sending.

By default, a storm control-enabled port sends log messages when monitored traffic exceeds the upper threshold or falls below the lower threshold from the upper threshold.

Examples

Disable GigabitEthernet 1/0/1 from sending out log messages upon detecting storm control threshold events.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] undo storm-constrain enable log
```

storm-constrain enable trap

Syntax

storm-constrain enable trap

undo storm-constrain enable trap

View

Ethernet interface view

Default level

2: System level

Parameters

None

Description

Use **storm-constrain enable trap** to enable an Ethernet interface to send storm control threshold event traps. Triggering events include traffic exceeding the upper threshold and traffic falling below the lower threshold from the upper threshold.

Use **undo storm-constrain enable trap** to disable trap message sending.

By default, a storm control-enabled interface sends traps when monitored traffic exceeds the upper threshold or falls below the lower threshold from the upper threshold.

Examples

Disable GigabitEthernet 1/0/1 from sending out storm control threshold event traps.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] undo storm-constrain enable trap
```

storm-constrain interval

Syntax

storm-constrain interval *seconds*

undo storm-constrain interval

View

System view

Default level

2: System level

Parameters

seconds: Sets the traffic polling interval of the storm control module, ranging from 1 to 300 seconds.

Description

Use **storm-constrain interval** to set the traffic polling interval of the storm control module.

Use **undo storm-constrain interval** to restore the default.

By default, the storm control module polls traffic statistics every 10 seconds.

For network stability, use the default or a higher polling interval.

> **NOTE:**
>
> The interval set by the **storm-constrain interval** command is specific to storm control. To set the statistics polling interval of an interface, use the **flow-interval** command.

Examples

Set the traffic statistics polling interval of the storm control module to 60 seconds.

```
<Sysname> system-view
[Sysname] storm-constrain interval 60
```

unicast-suppression

Syntax

unicast-suppression { *ratio* | **pps** *max-pps* | **kbps** *max-kbps* }

undo unicast-suppression

View

Ethernet interface view, port group view

Default level

2: System level

Parameters

ratio: Sets the unknown unicast suppression threshold as a percentage of the maximum interface rate, ranging from 1 to 100. The smaller the percentage, the less unknown unicast traffic is allowed to pass through.

pps *max-pps*: Specifies the maximum number of unknown unicast packets that the Ethernet interface can forward per second.

- For GE ports, the *max-pps* argument ranges from 1 to 1,488,100 pps.
- For 10-GE ports, the *max-pps* argument ranges from 1 to 14,881,000 pps.

kbps *max-kbps*: Specifies the maximum number of kilobits of unknown unicast traffic that the Ethernet interface can forward per second.

- For GE ports, the *max-kbps* argument ranges from 1 to 1,000,000 kbps.
- For 10-GE ports, the *max-kbps* argument ranges from 1 to 10,000,000 kbps.

Description

Use **unicast-suppression** to set the unknown unicast suppression threshold on one or multiple Ethernet interfaces.

Use **undo unicast-suppression** to restore the default.

By default, Ethernet interfaces do not suppress unknown unicast traffic.

If you execute this command in Ethernet interface view, the configurations take effect only on the interface. If you execute this command in port group view, the configurations take effect on all ports in the port group.

When you configure the unknown unicast suppression threshold in kbps, if the input value is less than 64, the value that takes effect is 64; if the input value is greater than 64 but is not a multiple of 64, the value that takes effect is a multiple of 64 greater than and nearest to the input value.

When unknown unicast traffic exceeds the threshold you configure, the system discards unknown unicast packets until the unknown unicast traffic drops below the threshold.

NOTE:
- If you set different unknown unicast suppression thresholds in Ethernet interface view or port group view multiple times, the one configured last takes effect.
- For a particular type of traffic, configure either storm suppression or storm control, but not both. If both of them are configured, you may fail to achieve the expected storm control effect.

Examples

\# Set the unknown unicast threshold to 20% on GigabitEthernet 1/0/1.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] unicast-suppression 20
```

\# Set the unknown unicast threshold to 20% on all ports of port group **group1**.

```
<Sysname> system-view
[Sysname] port-group manual group1
[Sysname-port-group-manual-group1] group-member gigabitethernet 1/0/1
[Sysname-port-group-manual-group1] group-member gigabitethernet 1/0/2
[Sysname-port-group-manual-group1] unicast-suppression 20
```

\# Set the unknown unicast suppression threshold to 10000 kbps on GigabitEthernet 1/0/1.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] unicast-suppression kbps 10000
Info: The actual value is 10048 on this port currently.
```

virtual-cable-test

Syntax

virtual-cable-test

View

Ethernet interface view

Default level

2: System level

Parameters

None

Description

Use **virtual-cable-test** to test the cable connection of an Ethernet interface. The test results are displayed within five seconds.

The following cable states are available:

- Normal—The cable is in good condition.
- Abnormal—Any fault other than a short or open circuit is detected.

If the cable connection is normal, the displayed cable length is the total length of the cable.

If the cable connection has a fault, it is the length from the local port to the faulty point.

If the link of an Ethernet interface is up, testing its cable connection will cause the link to go down and then up.

The test result is for reference only. The cable length detection error is up to 5 m (about 16 ft). If a test item is not available, a hyphen (-) is displayed.

NOTE:

Fiber ports do not support this command.

Examples

Test the cable connection of GigabitEthernet 1/0/1.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] virtual-cable-test
Cable status: normal, 1 metres
Pair Impedance mismatch: -
Pair skew: - ns
Pair swap: -
Pair polarity: -
Insertion loss: - db
Return loss: - db
Near-end crosstalk: - db
```

NOTE:

The **Pair Impedance mismatch** field has the following values:

- **Yes**—Match
- **No**—Mismatch

Loopback and null interface configuration commands

default

Syntax

> **default**

View

> Loopback interface view, null interface view

Default level

> 2: System level

Parameters

> None

Description

> Use **default** to restore the default settings for the loopback or null interface.
>
> This command might fail to restore the default settings for some commands for reasons such as command dependencies and system restrictions. You can use the **display this** command in interface view to check for these commands, and perform their **undo** forms or follow the command reference to individually restore their default settings. If your restoration attempt still fails, follow the error message to resolve the problem.

> △ CAUTION:
>
> The **default** command might interrupt ongoing network services. Make sure you are fully aware of the impacts of this command when you perform it on a live network.

Examples

> \# Restore the default settings of interface loopback 0.
>
> ```
> <Sysname> system-view
> [Sysname] interface loopback 0
> [Sysname-loopback0] default
> This command will restore the default settings. Continue? [Y/N]:y
> ```

description

Syntax

> **description** *text*
>
> **undo description**

View

> Loopback interface view, null interface view

Default level

2: System level

Parameters

text: Creates an interface description, a string of 1 to 80 characters. Valid characters and symbols include English letters (A to Z, a to z), digits (0 to 9), special English characters, spaces, and other Unicode characters and symbols.

Description

Use **description** to set a description for the interface.

Use **undo description** to restore the default.

By default, the description of a loopback or null interface is *interface name* Interface. For example: Loopback0 interface.

An interface description can be a mixture of English characters and other Unicode characters. The mixed description cannot exceed the specified length.

To use a type of Unicode characters or symbols in an interface description, you must install the corresponding Input Method Editor (IME) and log in to the device through supported remote login software.

Each non-English Unicode character or symbol takes the space of two regular characters. When the length of a description string reaches or exceeds the maximum line width on the terminal software, the software starts a new line. If a line is broken, it may break a Unicode character into two parts and create garbled characters.

Related commands: **display interface**.

Examples

Set the description for interface loopback 0 to loopback0.
```
<Sysname> system-view
[Sysname] interface loopback 0
[Sysname-loopback0] description loopback0
```

display interface loopback

Syntax

display interface [**loopback**] [**brief** [**down**]] [**|** { **begin** | **exclude** | **include** } *regular-expression*]

display interface loopback *interface-number* [**brief**] [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

1: Monitor level

Parameters

interface-number: Loopback interface number, which can be the number of any existing loopback interface. With this argument, this command displays information about a specified loopback interface.

brief: Displays brief interface information. If you do not specify this keyword, this command displays detailed interface information.

down: Displays information about interfaces in DOWN state and the causes. If you do not specify this keyword, this command displays information about interfaces in all states.

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display interface loopback** to display information about a loopback interface.

- If you do not specify the **loopback** keyword, this command displays information about all interfaces on the device.
- If you specify the **loopback** keyword without the *interface-number* argument, this command displays information about all created loopback interfaces.

Related commands: **interface loopback**.

Examples

Display detailed information about interface loopback 0.
```
<Sysname> display interface loopback 0
LoopBack0 current state: UP
Line protocol current state: UP (spoofing)
Description: LoopBack0 Interface
The Maximum Transmit Unit is 1536
Internet protocol processing : disabled
Physical is Loopback
Last clearing of counters:  Never
    Last 300 seconds input:  0 bytes/sec, 0 bits/sec, 0 packets/sec
    Last 300 seconds output:  0 bytes/sec, 0 bits/sec, 0 packets/sec
    0 packets input, 0 bytes, 0 drops
    0 packets output, 0 bytes, 0 drops
```

Display brief information about interface loopback 0.
```
<Sysname> display interface loopback 0 brief
The brief information of interface(s) under route mode:
Link: ADM - administratively down; Stby - standby
Protocol: (s) - spoofing
Interface         Link Protocol Main IP        Description
Loop0             UP   UP(s)     --
```

Table 12 Command output

Field	Description
current state	Physical state (up or administratively down) of the interface.

Field	Description
Line protocol current state	State of the data link layer protocol: up (spoofing). Spoofing refers to the spoofing attribute of the interface. When the network layer protocol state of the interface is displayed as up, the corresponding link may not exist, or the corresponding link is non-permanent and established on demand.
Description	Description string of the interface.
The Maximum Transmit Unit	Maximum transmission unit (MTU) of the interface.
Internet protocol processing	State (enabled or disabled) of the network layer protocol (displayed as **Internet Address is X.X.X.X/XX Primary**).
Physical is loopback	The physical type of the interface is loopback.
Last clearing of counters	Time when statistics on the logical interface were last cleared by using the **reset counters interface** command. If the statistics of the interface have never been cleared by using the **reset counters interface** command since device startup, this field displays **Never**.
Last 300 seconds input: 0 bytes/sec, 0 bits/sec, 0 packets/sec	Average input rate during the last 300 seconds (displayed when the interface supports traffic accounting), where the following conditions apply: • **packets/sec** indicates the average number of packets received per second. • **bytes/sec** indicates the average number of bytes received per second. • **bits/sec** indicates the average number of bits received per second.
Last 300 seconds output: 0 bytes/sec, 0 bits/sec, 0 packets/sec	Average output rate over the last 300 seconds (displayed when the interface supports traffic accounting), where the following conditions apply: • **packets/sec** indicates the average number of packets sent per second. • **bytes/sec** indicates the average number of bytes sent per second. • **bits/sec** indicates the average number of bits sent per second.
0 packets input, 0 bytes, 0 drops	Total number and size (in bytes) of input packets of the interface and the number of dropped packets.
0 packets output, 0 bytes, 0 drops	Total number and size (in bytes) of output packets of the interface and the number of dropped packets.
The brief information of interface(s) under route mode	Brief information about Layer 3 interfaces.
Link: ADM - administratively down; Stby - standby	Link status: • **ADM**—The interface has been administratively shut down. To recover its physical state, execute the **undo shutdown** command. • **Stby**—The interface is operating as a backup interface.
Protocol: (s) - spoofing	If the network layer protocol state of an interface is shown as UP, but its link is an on-demand link or not present at all, its protocol attribute includes the spoofing flag (an **s** in parentheses).

Field	Description
Interface	Abbreviated interface name.
Link	Physical link state of the interface: • **UP**—The link is up. • **ADM**—The link has been administratively shut down. To recover its physical state, perform the **undo shutdown** command.
Protocol	Protocol connection state of the interface, which can be UP, DOWN, or UP(s).
Main IP	The main IP address of the interface.
Description	Description of the interface.
Cause	The cause of a DOWN physical link. If the port has been shut down with the **shutdown** command, this field displays **Administratively**. To restore the physical state of the interface, use the **undo shutdown** command.

NOTE:

The switch does not support collecting statistics about average input or output rate of loopback interfaces. These fields display **0**.

display interface null

Syntax

display interface [**null**] [**brief** [**down**]] [**|** { **begin** | **exclude** | **include** } *regular-expression*]

display interface null 0 [**brief**] [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

1: Monitor level

Parameters

0: Specifies interface Null 0. The null interface number is fixed at 0, because the device has only one null interface.

brief: Displays brief interface information. If you do not specify this keyword, this command displays detailed interface information.

down: Displays information about interfaces in DOWN state and the causes. If you do not specify this keyword, this command displays information about interfaces in all states.

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display interface null** to display information about the null interface. Because Null 0 interface is the only null interface on a device, this command displays information about Null 0 interface, even if you do not specify the **0** keyword.

- If you do not specify the **null** keyword, this command displays information about all interfaces on the device.
- If you specify the **null** keyword, this command displays information about interface Null 0 with or without the **0** keyword, because the device supports only one interface Null 0.

Related commands: **interface null**.

Examples

Display detailed information about null interface Null 0.

```
<Sysname> display interface null 0
NULL0 current state :UP
Line protocol current state :UP (spoofing)
Description :   NULL0 Interface
The Maximum Transmit Unit is 1500
Internet protocol processing : disabled
Physical is NULL DEV
Last clearing of counters:  Never
    Last 300 seconds input:  0 bytes/sec, 0 bits/sec, 0 packets/sec
    Last 300 seconds output:  0 bytes/sec, 0 bits/sec, 0 packets/sec
    0 packets input, 0 bytes, 0 drops
    0 packets output, 0 bytes, 0 drops
```

Display brief information about interface Null 0.

```
<Sysname> display interface null 0 brief
The brief information of interface(s) under route mode:
Link: ADM - administratively down; Stby - standby
Protocol: (s) - spoofing
Interface           Link Protocol Main IP        Description
NULL0               UP   UP(s)    --
```

For the output description, see Table 12.

NOTE:

The switch does not support collecting statistics about average input or output rate of interface Null 0. These fields display **0**.

---

interface loopback

Syntax

interface loopback *interface-number*

undo interface loopback *interface-number*

View

System view

Default level

2: System level

Parameters

interface-number: Loopback interface number, ranging from 0 to 3.

Description

Use **interface loopback** to create a loopback interface or enter loopback interface view.

Use **undo interface loopback** to remove a loopback interface.

Related commands: **display interface loopback**.

Examples

Create interface loopback 0.

```
<Sysname> system-view
[Sysname] interface loopback 0
[Sysname-LoopBack0]
```

interface null

Syntax

interface null 0

View

System view

Default level

2: System level

Parameters

0: Specifies interface Null 0. The null interface number is fixed to 0.

Description

Use **interface null** to enter null interface view.

A device has only one null interface, interface Null 0. Interface Null 0 is always up. You cannot remove or shut it down.

Related commands: **display interface null**.

Examples

Enter Null 0 interface view.

```
<Sysname> system-view
[Sysname] interface null 0
[Sysname-NULL0]
```

reset counters interface loopback

Syntax

reset counters interface [**loopback** [*interface-number*]]

View

User view

Default level

2: System level

Parameters

interface-number: Number of the loopback interface, which can be the number of any existing loopback interface. With this argument, the command clears statistics on a specified loopback interface.

Description

Use **reset counters interface loopback** to clear statistics on loopback interfaces.

Before collecting traffic statistics within a specific period of time on a loopback interface, clear the existing statistics.

- If you do not specify the **loopback** keyword, this command clears the statistics on all interfaces in the system.
- If you specify the **loopback** keyword without the *interface-number* argument, this command clears the statistics on all loopback interfaces.

Examples

Clear statistics on loopback interface Loopback 0.

```
<Sysname> reset counters interface loopback 0
```

reset counters interface null

Syntax

reset counters interface [**null** [**0**]]

View

User view

Default level

2: System level

Parameters

0: Number of the null interface, which is fixed at 0.

Description

Use **reset counters interface null** to clear statistics on the null interface.

Before collecting traffic statistics within a specific period of time on the null interface, clear the existing statistics.

- If you do not specify the **null** keyword, this command clears statistics on all interfaces.
- If you specify the **null** keyword, this command clears the statistics on interface Null 0 with or without the **0** keyword, because the device supports only one interface Null 0.

Examples

Clear statistics on interface Null 0.

```
<Sysname> reset counters interface null 0
```

shutdown

shutdown

undo shutdown

View

Loopback interface view

Default level

2: System level

Parameters

None

Description

Use **shutdown** to shut down the loopback interface.

Use **undo shutdown** to bring up the loopback interface.

By default, a loopback interface is up.

Examples

Shut down loopback interface loopback 0.

```
<Sysname> system-view
[Sysname] interface loopback 0
[Sysname-Loopback0] shutdown
```

Bulk interface configuration commands

interface range

Syntax

> **interface range** *interface-list*

View

> System view

Default level

> 2: System level

Parameters

> *interface-list*: Specifies an interface list in the format of *interface-list* = { *interface-type interface-number* [**to** *interface-type interface-number*] }&<1-5>, where &<1-5> indicates that you can specify up to five interfaces or interface ranges. If you use the *interface-type interface-number* **to** *interface-type interface-number* option to specify an interface range, make sure that all the interfaces are on the same interface card or subcard, and the *interface-number* argument before **to** must be less than or equal to that after **to.**

Description

> Use **interface range** to create an interface range and enter interface range view.
>
> You can use this command to enter interface range view to bulk configure multiple interfaces with the same feature instead of configuring them one by one. For example, you can perform the **shutdown** command in interface range view to shut down a range of interfaces.
>
> In interface range view, only the commands supported by the first interface are available. To view the commands supported by the first interface in the interface range, enter the interface range view and enter **?** at the command line interface prompt.
>
> To verify the configuration of the first interface in the interface range, execute the **display this** command in interface range view.
>
> Failure to apply a command on one member interface does not affect the application of the command on the other member interfaces. If applying a command on one member interface fails, the system displays an error message and continues with the next member interface.

Examples

> # Shut down interfaces GigabitEthernet 1/0/1 through GigabitEthernet 1/0/24, VLAN interface 2,

```
<Sysname> system-view
[Sysname] interface range gigabitethernet 1/0/1 to gigabitethernet 1/0/24 vlan-interface
2
[Sysname-if-range] shutdown
```

interface range name

interface range name *name* [**interface** *interface-list*]

undo interface range name *name*

View

System view

Default level

2: System level

Parameters

name: Interface range name, a case-sensitive string of 1 to 32 characters.

interface-list: Interface list in the format of *interface-list* = { *interface-type interface-number* [**to** *interface-type interface-number*] }&<1-5>. The *interface-type interface-number* argument specifies an interface by its type and number. &<1-5> indicates that you can specify up to five interfaces or interface lists. When you specify the **to** keyword in *interface-type interface-number1* **to** *interface-type interface-number2*, the interfaces before and after the **to** keyword must be on the same interface card or subcard, and the interface number before **to** must be no greater than the one after **to**.

Description

Use **interface range name** *name* **interface** *interface-list* to create an interface range, configure a name for the interface range, add interfaces to the interface range, and enter the interface range view.

Use **interface range name** without the **interface** keyword to enter the view of an interface range with the specified name.

Use **undo interface range name** to delete the interface range with the specified name.

You can use this command to assign a name to an interface range and can specify this name rather than the interface range to enter the interface range view.

You can use the **display current-configuration | include interface range** command to view the member interfaces of an interface range.

In interface range view, only the commands supported by the first interface are available. To view the commands supported by the first interface in the interface range, enter the interface range view and enter **?** at the command line interface prompt.

To verify the configuration of the first interface in the interface range, execute the **display this** command in interface range view.

Failure to apply a command on one member interface does not affect the application of the command on the other member interfaces. If applying a command on one member interface fails, the system displays an error message and continues with the next member interface.

Do not assign an aggregate interface and any of its member interfaces to an interface range at the same time. Some commands, after being executed on both an aggregate interface and its member interfaces, can break up the aggregation.

No limit is set on the maximum number of interfaces in an interface range. The more interfaces in an interface range, the longer the command execution time.

Examples

Add GigabitEthernet 1/0/1 to GigabitEthernet 1/0/12 to interface range named **myEthPort**, and enter the interface range view.

```
<Sysname> system-view
[Sysname] interface range name myEthPort interface gigabitethernet 1/0/1 to
gigabitethernet 1/0/12
[Sysname-if-range-myEthPort]
```

Enter the view of interface range named **myEthPort**.

```
<Sysname> system-view
[Sysname] interface range name myEthPort
[Sysname-if-range-myEthPort]
```

MAC address table configuration commands

The MAC address table can contain only Layer 2 Ethernet ports and Layer 2 aggregate interfaces.

This feature covers only the unicast MAC address table. For information about configuring static multicast MAC address table entries for IGMP snooping and MLD snooping, see *IP Multicast Configuration Guide*.

display mac-address

Syntax

display mac-address [*mac-address* [**vlan** *vlan-id*] | [[**dynamic** | **static**] [**interface** *interface-type interface-number*] | **blackhole**] [**vlan** *vlan-id*] [**count**]] [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

1: Monitor level

Parameters

blackhole: Displays blackhole MAC address entries, which do not age and can be added and deleted. Packets with a matching source or destination MAC address are discarded.

vlan *vlan-id*: Displays MAC address entries of the specified VLAN, where *vlan-id* is in the range of 1 to 4094.

count: Displays the number of MAC address entries specified by related parameters in the command. When this keyword is used, the command displays only the number of specified MAC address entries, rather than related information about these MAC address entries.

mac-address: Displays MAC address entries of a specified MAC address, in the format of H-H-H.

dynamic: Displays dynamic MAC address entries, which can be aged.

static: Displays static MAC address entries, which do not age.

interface *interface-type interface-number*: Displays the MAC address learning status of the specified interface. *interface-type interface-number* specifies an interface by its type and number.

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display mac-address** to display information about the MAC address table.

If you execute this command without specifying any parameters, it displays information of all MAC address entries on the device, including unicast MAC address entries and static multicast MAC address entries.

If you execute this command using only the **vlan** keyword or the **count** keyword, or only these two keywords, it displays information of unicast MAC address entries and static multicast MAC address entries.

Related commands: **mac-address (system view)**, **mac-address (interface view)**, and **mac-address timer**; **display mac-address multicast** and **display mac-address multicast count** (*IP Multicast Command Reference*).

Examples

Display the MAC address table entry for MAC address 000f-e201-0101.

```
<Sysname> display mac-address 000f-e201-0101
MAC ADDR         VLAN ID   STATE          PORT INDEX          AGING TIME(s)
000f-e201-0101  1         Learned        GigabitEthernet1/0/1  AGING

  ---  1 mac address(es) found  ---
```

Table 13 Command output

Field	Description
MAC ADDR	MAC address.
VLAN ID	ID of the VLAN to which the MAC address belongs.
STATE	State of a MAC address entry: • **Config static**—The static entry manually configured by the user. • **Config dynamic**—The dynamic entry manually configured by the user. • **Learned**—The entry learned by the device. • **Blackhole**—The blackhole entry. • **Multicast**—The static multicast MAC address entry manually configured by the user. For more information about static multicast MAC address entries, see *IP Multicast Configuration Guide*.
PORT INDEX	Number of the port corresponding to the MAC address. Packets destined to this MAC address are sent out of this port. (Displayed as N/A for a blackhole MAC address entry).
AGING TIME(s)	Aging time: • **AGING**—The entry is aging. • **NOAGED**—The entry does not age.
1 mac address(es) found	One MAC address entry is found.

display mac-address aging-time

Syntax

display mac-address aging-time [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

1: Monitor level

Parameters

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display mac-address aging-time** to display the aging time of dynamic entries in the MAC address table.

Related commands: **mac-address (system view)**, **mac-address (interface view)**, **mac-address timer**, and **display mac-address**.

Examples

Display the aging time of dynamic entries in the MAC address table.

```
<Sysname> display mac-address aging-time
Mac address aging time: 300s
```

The output shows that the aging time of dynamic entries in the MAC address table is 300 seconds.

display mac-address mac-learning

Syntax

display mac-address mac-learning [*interface-type interface-number*] [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

1: Monitor level

Parameters

interface-type interface-number: Specifies an interface by its type and number.

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display mac-address mac-learning** to display the MAC address learning status of the specified or all Layer 2 Ethernet ports.

Examples

Display MAC address learning status of all Ethernet ports.

```
<Sysname> display mac-address mac-learning
Mac address learning status of the switch: enable

PortName                Learning Status
GigabitEthernet1/0/1    enable
GigabitEthernet1/0/2    enable
GigabitEthernet1/0/3    enable
GigabitEthernet1/0/4    enable
```

Table 14 Command output

Field	Description
Mac-address learning status of the switch	Global MAC address learning status (enabled or disabled).
PortName	Port name.
Learning Status	MAC address learning status (enabled or disabled) for a port.

display mac-address statistics

Syntax

display mac-address statistics [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

1: Monitor level

Parameters

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display mac-address statistics** to display the statistics of the MAC address table.

Examples

Display the statistics of the MAC address table.

```
<Sysname> display mac-address statistics
MAC TYPE           LEARNED    USER-DEFINED  SYSTEM-DEFINED IN-USE   AVAILABLE
Dynamic  Unicast   26         0             1              27
Static   Unicast   0          1             2              3        1024
Total    Unicast                                           30       16384
```

```
Dynamic  Multicast   0            0            0            0
Static   Multicast   0            0            2            2            512
Total    Multicast                                          2            512
```

Table 15 Command output

Field	Description
MAC TYPE	MAC address type: • Dynamic Unicast • Static Unicast • Total Unicast • Dynamic Multicast • Static Multicast • Total Multicast
LEARNED	Dynamically learned MAC addresses
USER-DEFINED	User defined MAC addresses (dynamic and static)
SYSTEM-DEFINED	MAC addresses generated by the system (for example, 802.1x and MAC authentication)
IN-USE	Number of existing MAC addresses of a specific type
AVAILABLE	Maximum number of MAC addresses supported by the system

mac-address (interface view)

Syntax

mac-address { dynamic | static } *mac-address* vlan *vlan-id*

undo mac-address { dynamic | static } *mac-address* vlan *vlan-id*

View

Layer 2 Ethernet interface view, Layer 2 aggregate interface view

Default level

2: System level

Parameters

dynamic: Specifies dynamic MAC address entries. These entries can age.

static: Specifies static MAC address entries. They do not age, but you can add or remove them.

mac-address: Specifies a MAC address in the format of H-H-H, where 0s at the beginning of each H (16-bit hexadecimal digit) can be omitted. For example, inputting "f-e2-1" indicates that the MAC address is 000f-00e2-0001.

vlan *vlan-id*: Specifies an existing VLAN to which the Ethernet interface belongs, where *vlan-id* is the specified VLAN ID, in the range of 1 to 4094.

Description

Use mac-address to add or modify a MAC address entry on a specified interface.

Use **undo mac-address** to remove a MAC address entry on the interface.

By default, no MAC address entry is configured on an interface.

The MAC address entries configuration cannot survive a reboot unless you save it. The dynamic MAC address table entries, however, are lost at next reboot whether or not you save the configuration.

Related commands: **display mac-address**.

Examples

Add a static entry for MAC address 000f-e201-0101 on port GigabitEthernet 1/0/1 that belongs to VLAN 2.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] mac-address static 000f-e201-0101 vlan 2
```

Add a static entry for MAC address 000f-e201-0102 on port Bridge-Aggregation 1 that belongs to VLAN 1.

```
<Sysname> system-view
[Sysname] interface bridge-aggregation 1
[Sysname-Bridge-Aggregation1] mac-address static 000f-e201-0102 vlan 1
```

mac-address (system view)

Syntax

mac-address blackhole *mac-address* **vlan** *vlan-id*

mac-address { **dynamic** | **static** } *mac-address* **interface** *interface-type interface-number* **vlan** *vlan-id*

undo mac-address [{ **dynamic** | **static** } *mac-address* **interface** *interface-type interface-number* **vlan** *vlan-id*]

undo mac-address [**blackhole** | **dynamic** | **static**] [*mac-address*] **vlan** *vlan-id*

undo mac-address [**dynamic** | **static**] *mac-address* **interface** *interface-type interface-number* **vlan** *vlan-id*

undo mac-address [**dynamic** | **static**] **interface** *interface-type interface-number*

View

System view

Default level

2: System level

Parameters

blackhole: Specifies blackhole MAC address entries. These entries do not age, but you can add or remove them. The packets whose source or destination MAC addresses match the blackhole MAC address entries are dropped.

mac-address: Specifies a MAC address in the format of H-H-H, where 0s at the beginning of each H (16-bit hexadecimal digit) can be omitted. For example, inputting "f-e2-1" indicates that the MAC address is 000f-00e2-0001.

vlan *vlan-id*: Specifies an existing VLAN to which the Ethernet interface belongs, where *vlan-id* is the specified VLAN ID, in the range of 1 to 4094.

dynamic: Specifies dynamic MAC address entries, which can be aged.

static: Specifies static MAC address entries. These entries do not age, but you can add or remove them.

interface *interface-type interface-number*: Specifies an outbound interface by its type and number.

Description

Use **mac-address** to add or modify a MAC address entry.

Use **undo mac-address** to remove one or all MAC address entries.

By default, no MAC address entry is configured in the system.

A static or blackhole MAC address entry will not be overwritten by a dynamic MAC address entry. A dynamic MAC address entry can be overwritten by a static or blackhole MAC address entry.

If you execute the **undo mac-address** command without specifying any parameters, this command deletes all unicast MAC address entries and static multicast MAC address entries.

You can delete all the MAC address entries (including unicast MAC address entries and static multicast MAC address entries) of a VLAN, or you can choose to delete a specific type (dynamic, static, or blackhole) of MAC address entries only. You can single out certain ports and delete the corresponding unicast MAC address entries, but not the corresponding static multicast MAC address entries.

The MAC address entries configuration cannot survive a reboot unless you save it. The dynamic MAC address table entries, however, are lost at next reboot regardless of whether or not you save the configuration.

Related commands: **display mac-address**.

Examples

Add a static entry for MAC address 000f-e201-0101. All frames destined to this MAC address are sent out of port GigabitEthernet 1/0/1 which belongs to VLAN 2.

```
<Sysname> system-view
[Sysname] mac-address static 000f-e201-0101 interface gigabitethernet 1/0/1 vlan 2
```

mac-address destination-hit disable

Use **mac-address destination-hit disable** to disable MAC entry aging timer refresh based on destination MAC address.

Use **undo mac-address destination-hit disable** to restore the default.

Syntax

mac-address destination-hit disable

undo mac-address destination-hit disable

Default

MAC entry aging timer refresh based on destination MAC address is enabled.

View

System view

Default command level:

2: System level

Examples

Disable MAC entry aging timer refresh based on destination MAC address.

```
<Sysname> system-view
```

```
[Sysname] mac-address destination-hit disable
```

mac-address mac-learning disable

Syntax

mac-address mac-learning disable

undo mac-address mac-learning disable

View

System view, Layer 2 Ethernet interface view, port group view, Layer 2 aggregate interface view

Default level

2: System level

Parameters

None

Description

Use **mac-address mac-learning disable** to disable MAC address learning. Depending on the view that you entered, you can disable it globally, or on a Layer 2 interface or a group of Ethernet ports.

Use **undo mac-address mac-learning disable** to enable MAC address learning. Depending on the view that you entered, you can disable it globally, or on a Layer 2 interface or a group of Ethernet ports.

By default, MAC address learning is enabled.

Follow these guidelines when you configure MAC address learning:

- You may need to disable MAC address learning to prevent the MAC address table from being saturated. For example, when your device is being attacked by many packets with different source MAC addresses, it affects the update of the MAC address table.
- Because disabling MAC address learning may result in broadcast storms, enable broadcast storm suppression after you disable MAC address learning on a port.

Related commands: **display mac-address mac-learning**.

NOTE:

When MAC address learning is disabled, the learned MAC addresses remain valid until they age out.

Examples

Disable global MAC address learning.

```
<Sysname> system-view
[Sysname] mac-address mac-learning disable
```

Disable MAC address learning on port GigabitEthernet 1/0/1.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] mac-address mac-learning disable
```

Disable MAC address learning on Bridge-Aggregation 1.

```
<Sysname> system-view
[Sysname] interface bridge-aggregation 1
[Sysname-Bridge-Aggregation1] mac-address mac-learning disable
```

mac-address mac-roaming enable

Syntax

mac-address mac-roaming enable

undo mac-address mac-roaming enable

View

System view

Default level

2: System level

Parameters

None

Description

Use **mac-address mac-roaming enable** to enable MAC address roaming.

Use **undo mac-address mac-roaming enable** to disable MAC address roaming.

By default, MAC address roaming is disabled.

Examples

\# Enable MAC address roaming.
```
<Sysname> system-view
[Sysname] mac-address mac-roaming enable
```

mac-address max-mac-count

Syntax

mac-address max-mac-count *count*

undo mac-address max-mac-count

View

Layer 2 Ethernet interface view, port group view

Default level

2: System level

Parameters

count: Specifies the maximum number of MAC addresses that can be learned on a port. The value is in the range of 0 to 4096. When the argument takes 0, the VLAN is not allowed to learn MAC addresses.

Description

Use **mac-address max-mac-count** *count* to configure the maximum number of MAC addresses that can be learned on a port.

Use **undo mac-address max-mac-count** to restore the default maximum number of MAC addresses that can be learned on an Ethernet port.

By default, no MAC learning limit is configured.

If the command is executed in interface view, the configuration takes effect on the interface only. If the command is executed in port group view, the configuration takes effect on all ports in the port group.

Related commands: **mac-address** and **mac-address timer**.

Examples

Set the maximum number of MAC addresses that can be learned on port GigabitEthernet 1/0/1 to 600.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] mac-address max-mac-count 600
```

mac-address timer

Syntax

mac-address timer { **aging** *seconds* | **no-aging** }

undo mac-address timer aging

View

System view

Default level

2: System level

Parameters

aging *seconds*: Sets an aging timer (in seconds) for dynamic MAC address entries. The value is in the range of 10 to 1000000 seconds.

no-aging: Sets dynamic MAC address entries not to age.

Description

Use **mac-address timer** to configure the aging timer for dynamic MAC address entries.

Use **undo mac-address timer** to restore the default.

By default, the aging timer is 300 seconds.

Follow these guidelines to set the aging timer appropriately:

- A long aging interval may cause the MAC address table to retain outdated entries and fail to accommodate the latest network changes.
- A short aging interval may result in removal of valid entries and unnecessary broadcasts that may affect the performance of the switch.

Examples

Set the aging timer for dynamic MAC address entries to 500 seconds.

```
<Sysname> system-view
[Sysname] mac-address timer aging 500
```

mac-flapping notification enable

Use **mac-flapping notification enable** to enable MAC address migration log notifying.

Use **undo mac-flapping notification enable** to disable the MAC address migration notifying.

Syntax

mac-flapping notification enable

undo mac-flapping notification enable

MAC address migration log notifying is disabled.

System view

2: System level

A MAC address migration log contains a MAC address, ID of the VLAN to which the MAC address belongs, source interface from which the MAC address migrates, and the current interface with which the MAC address associates.

After enabling MAC address migration log notifying, the MAC address migration log of the last 1 minute are displayed once every 1 minute.

Up to 10 logs can be saved in 1 minute.

Enable MAC address migration log notifying.

```
<Sysname> system-view
[Sysname] mac-flapping notification enable
[Sysname]
%Sep 21 14:09:22:420 2012 HP MAC/5/MAC_FLAPPING: MAC address 0000-0012-0034 in vlan 500
has flapped from port GigabitEthernet1/0/16 to port GigabitEthernet1/0/1 1 time(s).
```

The output shows that the MAC address 0000-0012-0034 belongs to VLAN 500, the source interface from which the MAC address migrates from is GE1/0/16, the current interface with which the MAC address associates is GE1/0/1, and the MAC address migrates one time in the last one minute.

MAC Information configuration commands

MAC Information applies only to Layer 2 Ethernet interfaces.

mac-address information enable (interface view)

Syntax

mac-address information enable { **added** | **deleted** }

undo mac-address information enable { **added** | **deleted** }

View

Layer 2 Ethernet interface view

Default level

1: Monitor level

Parameters

added: Enables the device to record security information when a new MAC address is learned on the Ethernet port.

deleted: Enables the device to record security information when an existing MAC address is deleted.

Description

Use **mac-address information enable** to enable MAC Information on the Layer 2 Ethernet interface.

Use **undo mac-address information enable** to restore the default.

By default, MAC Information is disabled on a Layer 2 Ethernet interface.

This command is not supported on aggregate interfaces.

To enable MAC Information on an Ethernet interface, enable MAC Information globally.

Examples

Enable MAC Information on GigabitEthernet 1/0/1.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] mac-address information enable added
```

mac-address information enable (system view)

Syntax

mac-address information enable

undo mac-address information enable

View

System view

Default level

2: System level

Parameters

None

Description

Use **mac-address information enable** to enable MAC Information globally.

Use **undo mac-address information enable** to restore the default.

By default, MAC Information is disabled globally.

Examples

Enable MAC Information globally.
```
<Sysname> system-view
[Sysname] mac-address information enable
```

mac-address information interval

Syntax

mac-address information interval *interval-time*

undo mac-address information interval

View

System view

Default level

2: System level

Parameters

interval-time: Sets the interval for sending Syslog or trap messages, in the range of 1 to 20,000 seconds.

Description

Use **mac-address information interval** to set the interval for sending Syslog or trap messages.

Use **undo mac-address information interval** to restore the default.

By default, the interval for sending Syslog or trap messages is 1 second.

Examples

Set the interval for sending Syslog or trap messages to 200 seconds.
```
<Sysname> system-view
[Sysname] mac-address information interval 200
```

mac-address information mode

Syntax

mac-address information mode { **syslog** | **trap** }

undo mac-address information mode { **syslog** | **trap** }

View

System view

Default level

2: System level

Parameters

syslog: Specifies that the device sends Syslog messages to inform the remote network management device of MAC address changes.

trap: Specifies that the device sends trap messages to inform the remote network management device of MAC address changes.

Description

Use **mac-address information mode** to set the MAC Information mode (to use Syslog messages or trap messages) to inform the remote network management device of MAC address changes.

Use **undo mac-address information mode** to restore the default.

By default, trap messages are sent to inform the remote network management device of MAC address changes.

Examples

\# Configure the device to send trap messages to inform the remote network management device of MAC address changes.

```
<Sysname> system-view
[Sysname] mac-address information mode trap
```

mac-address information queue-length

Syntax

mac-address information queue-length *value*

undo mac-address information queue-length

View

System view

Default level

2: System level

Parameters

value: Specifies the MAC Information queue length, in the range of 0 to 1000.

Description

Use **mac-address information queue-length** to set the MAC Information queue length.

Use **undo mac-address information queue-length** to restore the default.

By default, the MAC Information queue length is 50.

Examples

\# Set the MAC Information queue length to 600.

```
<Sysname> system-view
[Sysname] mac-address information queue-length 600
```

Ethernet link aggregation configuration commands

default

Syntax

default

View

Layer 2 aggregate interface view

Default level

2: System level

Parameters

None

Description

Use **default** to restore the default settings for an aggregate interface.

> △ CAUTION:
> The **default** command might interrupt ongoing network services. Make sure you are fully aware of the impacts of this command when you execute it on a live network.

This command might fail to restore the default settings for some commands for reasons such as command dependencies and system restrictions. Use the **display this** command in interface view to identify these commands, and then use their **undo** forms or follow the command reference to individually restore their default settings. If your restoration attempt still fails, follow the error message instructions to resolve the problem.

Examples

Restore the default settings for Layer 2 aggregate interface Bridge-Aggregation 1.

```
<Sysname> system-view
[Sysname] interface bridge-aggregation 1
[Sysname-Bridge-Aggregation1] default
This command will restore the default settings. Continue? [Y/N]:y
```

description

Syntax

description *text*

undo description

View

Layer 2 aggregate interface view

Default level

2: System level

Parameters

text: Specifies the interface description, a string of 1 to 80 characters.

Description

Use **description** to set a description for an interface. For example, you can include information such as the purpose of the interface for the ease of management.

Use **undo description** to restore the default setting.

By default, the description of an interface is *interface-name* **Interface**. For example, the default description of Bridge-Aggregation1 is **Bridge-Aggregation1 Interface**.

Examples

Set the description of Layer 2 aggregate interface Bridge-Aggregation 1 to **connect to the lab**.

```
<Sysname> system-view
[Sysname] interface bridge-aggregation 1
[Sysname-Bridge-Aggregation1] description connect to the lab
```

display interface

Syntax

display interface [**bridge-aggregation**] [**brief** [**down**]] [**|** { **begin** | **exclude** | **include** } *regular-expression*]

display interface bridge-aggregation *interface-number* [**brief**] [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

1: Monitor level

Parameters

bridge-aggregation: Displays information about Layer 2 aggregate interfaces.

interface-number: Specifies an existing aggregate interface number. The value range for the *interface-number* argument is the set of all existing aggregate interface numbers.

brief: Displays brief interface information. If you do not specify this keyword, this command displays detailed interface information.

down: Displays information about interfaces in the DOWN state and the causes. If you do not specify this keyword, this command displays information about interfaces in all states.

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display interface** to display aggregate interface information.

If **bridge-aggregation** is not specified, this command displays information about all interfaces.

If **bridge-aggregation** is specified without any interface number specified, this command displays information about all aggregate interfaces.

If **bridge-aggregation** *interface-number* is specified, this command displays information about the specified aggregate interface.

Examples

Display information about Layer 2 aggregate interface Bridge-Aggregation 1.

```
<Sysname> display interface bridge-aggregation 1
 Bridge-Aggregation1 current state: DOWN
 IP Packet Frame Type: PKTFMT_ETHNT_2, Hardware Address: 000f-e207-f2e0
 Description: Bridge-Aggregation1 Interface
 Unknown-speed mode, unknown-duplex mode
 Link speed type is autonegotiation, link duplex type is autonegotiation
 PVID: 1
 Port link-type: access
  Tagged   VLAN ID : none
  Untagged VLAN ID : 1
 Last clearing of counters:  Never
 Last 300 seconds input:  0 packets/sec 0 bytes/sec    -%
 Last 300 seconds output:  0 packets/sec 0 bytes/sec    -%
 Input (total):  0 packets, 0 bytes
          0 unicasts, 0 broadcasts, 0 multicasts
 Input (normal):  0 packets, 0 bytes
          0 unicasts, 0 broadcasts, 0 multicasts
 Input:  0 input errors, 0 runts, 0 giants, 0 throttles
          0 CRC, 0 frame, 0 overruns, 0 aborts
          0 ignored, 0 parity errors
 Output (total): 0 packets, 0 bytes
          0 unicasts, 0 broadcasts, 0 multicasts, 0 pauses
 Output (normal): 0 packets, 0 bytes
          0 unicasts, 0 broadcasts, 0 multicasts, 0 pauses
 Output: 0 output errors, 0 underruns, 0 buffer failures
          0 aborts, 0 deferred, 0 collisions, 0 late collisions
          0 lost carrier, 0 no carrier
```

Display brief information about Layer 2 aggregate interface Bridge-Aggregation 1.

```
<Sysname> display interface bridge-aggregation 1 brief
The brief information of interface(s) under bridge mode:
Link: ADM - administratively down; Stby - standby
Speed or Duplex: (a)/A - auto; H - half; F - full
Type: A - access; T - trunk; H - hybrid
Interface            Link Speed    Duplex Type PVID Description
BAGG1                DOWN auto     A      A    1
```

Table 16 Command output

Field	Description
Bridge-Aggregation1 current state	The Layer 2 interface status: • **DOWN (Administratively)**—The interface is administratively shut down with the **shutdown** command. • **DOWN**—The interface is administratively up but physically down (possibly because no physical link is present or the link is faulty). • **UP**—The Ethernet interface is both administratively and physically up.
Unknown-speed mode, unknown-duplex mode	The interface speed and duplex mode are unknown.
PVID	Port default VLAN ID (PVID).
Last clearing of counters	Time when the **reset counters interface** command was last used to clear the interface statistics. **Never** indicates the **reset counters interface** command has never been used on the interface since the device's startup.
Last 300 seconds input/output	Average input/output rate over the last 300 seconds.
Input/Output (total)	Statistics of all packets received/sent on the interface.
Input/Output (normal)	Statistics of all normal packets received/sent on the interface.
Line protocol current state	Link layer state of the interface.
Internet protocol processing	IP packet processing. If IP packets cannot be processed, this field displays **Disabled.** For an interface configured with an IP address, this field changes to **Internet Address is**.
The brief information of interface(s) under bridge mode	Brief information about Layer 2 interfaces.
Link: ADM - administratively down; Stby - standby	Link status: • **ADM**—The interface has been administratively shut down. To recover its physical layer state, perform the **undo shutdown** command. • **Stby**—The interface is operating as a backup interface.
Speed or Duplex: (a)/A - auto; H - half; F - full	If the speed of an interface is automatically negotiated, its speed attribute includes the auto negotiation flag, letter **a** in parentheses. If the duplex mode of an interface is automatically negotiated, its duplex mode attribute includes the auto negotiation flag, letter **a** in parentheses or a capital **A**. Letter **H** indicates the half duplex mode, and letter **F** indicates the full duplex mode.
Type: A - access; T - trunk; H - hybrid	Link type options for Ethernet interfaces.

display lacp system-id

Syntax

display lacp system-id [**|** { **begin** | **exclude** | **include** } *regular-expression*]

Any view

Default level

1: Monitor level

Parameters

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display lacp system-id** to display the system ID of the local system.

The system ID comprises the system LACP priority and the system MAC address.

Use **lacp system-priority** to change the LACP priority of the local system. Although you specify the LACP priority value in decimal format in the **lacp system-priority** command, it is displayed as a hexadecimal value with the **display lacp system-id** command.

Related commands: **lacp system-priority**.

Examples

Display the local system ID.
```
<Sysname> display lacp system-id
 Actor System ID: 0x8000, 0000-fc00-6504
```

Table 17 Command output

Field	Description
Actor System ID: 0x8000, 0000-fc00-6504	The local system ID, which comprises the system LACP priority (0x8000 in this sample output) and the system MAC address (0000-fc00-6504 in this sample output).

display link-aggregation load-sharing mode

Syntax

display link-aggregation load-sharing mode [**interface** [**bridge-aggregation** *interface-number*]] [| { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

1: Monitor level

Parameters

bridge-aggregation: Displays the load sharing criteria of the aggregation group corresponding to the specified Layer 2 aggregate interface.

interface-number: Specifies an existing aggregate interface number.

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display link-aggregation load-sharing mode** to display global or group-specific link-aggregation load sharing criteria.

To display the global link-aggregation load sharing criteria, run the command without the **interface** keyword.

To display all the group-specific load sharing criteria, run the command with the **interface** keyword, but do not specify a particular interface.

To display the load sharing criterion or criteria of a particular aggregation group, perform the command with the aggregate interface specified.

The **bridge-aggregation** keyword becomes available only after you create Layer 2 aggregate interfaces on the device.

Examples

Display the global link-aggregation load sharing criteria.

```
<Sysname>display link-aggregation load-sharing mode
Link-Aggregation Load-Sharing Mode:
Layer 2 traffic: ingress-port,          destination-mac address,
                 source-mac address
Layer 3 traffic: destination-ip address,  source-ip address
```

Display the default link-aggregation load sharing criteria of the aggregation group corresponding to Layer 2 aggregate interface Bridge-Aggregation 10.

```
<Sysname>display link-aggregation load-sharing mode interface bridge-aggregation 10
Bridge-Aggregation10 Load-Sharing Mode:
Layer 2 traffic: ingress-port,          destination-mac address,
                 source-mac address
Layer 3 traffic: destination-ip address,  source-ip address
```

Table 18 Command output

Field	Description
Link-Aggregation Load-Sharing Mode	Global link-aggregation load sharing criteria.
Bridge-Aggregation10 Load-Sharing Mode	Link-aggregation load sharing criteria of the aggregation group corresponding to the aggregate interface Bridge-Aggregation 10.

Field	Description
Layer 2 traffic: ingress-port, destination-mac address, source-mac address	Default link-aggregation load sharing criteria for Layer 2 traffic. In this sample output, the criteria are the ingress-port, the source MAC address, and the destination MAC addresses of packets.
Layer 3 traffic: destination-ip address, source-ip address	Default link-aggregation load sharing criteria for Layer 3 traffic. In this sample output, the criteria are the source and destination IP addresses of packets.

display link-aggregation member-port

Syntax

display link-aggregation member-port [*interface-list*] [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

1: Monitor level

Parameters

interface-list: Specifies a list of link aggregation member ports, in the format *interface-type interface-number* [**to** *interface-type interface-number*], where *interface-type interface-number* indicates the port type and port number.

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display link-aggregation member-port** to display detailed link aggregation information for the specified member ports. If no port is specified, this command displays detailed link aggregation information for all member ports.

Only the port number and operational key of a member port in a static aggregation group are displayed, because the aggregation group is not aware of the partner's information.

Examples

Display detailed link aggregation information for GigabitEthernet 1/0/1, a member port of a static aggregation group.

```
<Sysname>display link-aggregation member-port gigabitethernet 1/0/1
Flags: A -- LACP_Activity, B -- LACP_Timeout, C -- Aggregation,
       D -- Synchronization, E -- Collecting, F -- Distributing,
       G -- Defaulted, H -- Expired

GigabitEthernet1/0/1:
```

```
Aggregation Interface: Bridge-Aggregation1
Port Number: 3
Port Priority: 32768
Oper-Key: 2
```

Display detailed link aggregation information for GigabitEthernet 1/0/2, a member port of a dynamic aggregation group.

```
<Sysname>display link-aggregation member-port gigabitethernet 1/0/2
Flags: A -- LACP_Activity, B -- LACP_Timeout, C -- Aggregation,
       D -- Synchronization, E -- Collecting, F -- Distributing,
       G -- Defaulted, H -- Expired

GigabitEthernet1/0/2:
Aggregation Interface: Bridge-Aggregation2
Local:
    Port Number: 7
    Port Priority: 32768
    Oper-Key: 3
    Flag: {ACG}
Remote:
    System ID: 0x8000, 0000-0000-0000
    Port Number: 0
    Port Priority: 32768
    Oper-Key: 0
    Flag: {EF}
Received LACP Packets: 0 packet(s)
Illegal: 0 packet(s)
Sent LACP Packets: 0 packet(s)
```

Table 19 Command output

Field	Description
Flags	LACP state flags: • **A**—LACP is enabled. • **B**—Indicates the LACP short timeout. • **C**—The sending system detects that the link is aggregatable. • **D**—The sending system detects that the link is synchronized. • **E**—The sending system detects that the incoming frames are collected. • **F**—The sending system detects that the outgoing frames are distributed. • **G**—The sending system receives frames in the default state. • **H**—The sending system receives frames in the expired state.
Aggregation Interface	Aggregate interface to which the member port belongs.
Local	Information about the local end.
Port Priority	Aggregation priority of the port.
Oper-key	Operational key.
Flag	LACP protocol state flag.
Remote	Information about the remote end.

Field	Description
System ID	Remote end system ID, comprising the system LACP priority and the system MAC address.
Received LACP Packets	Total number of LACP packets received.
Illegal	Total number of illegal packets.
Sent LACP Packets	Total number of LACP packets sent.

display link-aggregation summary

Syntax

display link-aggregation summary [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

1: Monitor level

Parameters

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display link-aggregation summary** to display the summary information for all aggregation groups.

The information about the remote system for a static link aggregation group may be displayed as **none** or may not be displayed, because the aggregation group is not aware of the partner's information.

Examples

Display the summary information for all aggregation groups.

```
<Sysname> display link-aggregation summary
Aggregation Interface Type:
BAGG -- Bridge-Aggregation, RAGG -- Route-Aggregation
Aggregation Mode: S -- Static, D -- Dynamic
Loadsharing Type: Shar -- Loadsharing, NonS -- Non-Loadsharing
Actor System ID: 0x8000, 000f-e267-6c6a

AGG         AGG        Partner ID              Select Unselect  Share
Interface   Mode                               Ports  Ports    Type
--------------------------------------------------------------------
BAGG1       S          none                    1      0         Shar
BAGG10      D          0x8000, 000f-e267-57ad  2      0         Shar
```

Table 20 Command output

Field	Description
Aggregation Interface Type	Aggregate interface type: • **BAGG**—Layer 2 aggregate interface. • **RAGG**—Layer 3 aggregate interface.
Aggregation Mode	Aggregation group type: • **S**—Static link aggregation. • **D**—Dynamic aggregation.
Loadsharing Type	Load sharing type: • **Shar**—Load sharing. • **NonS**—Non-load sharing.
Actor System ID	Local system ID, which comprises the system LACP priority and the system MAC address.
AGG Interface	Type and number of the aggregate interface.
AGG Mode	Aggregation group type.
Partner ID	System ID of the partner, which comprises the system LACP priority and the system MAC address.
Select Ports	Total number of Selected ports.
Unselect Ports	Total number of Unselected ports.
Share Type	Load sharing type.

display link-aggregation verbose

Syntax

display link-aggregation verbose [**bridge-aggregation** [*interface-number*]] [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

1: Monitor level

Parameters

bridge-aggregation: Displays detailed information about the Layer 2 aggregation groups corresponding to Layer 2 aggregate interfaces.

interface-number: Specifies an existing aggregate interface number.

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display link-aggregation verbose** to display detailed information about the aggregation groups corresponding to the aggregate interfaces.

Use **display link-aggregation verbose bridge-aggregation** *interface-number* to display information about a specific Layer 2 aggregation group.

Use **display link-aggregation verbose bridge-aggregation** to display information about all Layer 2 aggregation groups,.

Use **display link-aggregation verbose** to display information about all aggregation groups.

The **bridge-aggregation** keyword is available only when you create Layer 2 aggregate interfaces on the device.

Examples

Display detailed information about the aggregation group corresponding to Layer 2 aggregate interface Bridge-Aggregation 1, which is a dynamic aggregation group.

```
<Sysname> display link-aggregation verbose bridge-aggregation 1
Loadsharing Type: Shar -- Loadsharing, NonS -- Non-Loadsharing
Port Status: S -- Selected, U -- Unselected
Flags:  A -- LACP_Activity, B -- LACP_Timeout, C -- Aggregation,
        D -- Synchronization, E -- Collecting, F -- Distributing,
        G -- Defaulted, H -- Expired

Aggregation Interface: Bridge-Aggregation1
Aggregation Mode: Dynamic
Loadsharing Type: Shar
System ID: 0x8000, 000f-e267-6c6a
Local:
  Port            Status  Priority Oper-Key  Flag
--------------------------------------------------------------------------------
  GE1/0/26          S       32768    2          {ACDEF}
  GE1/0/32          S       32768    2          {ACDEF}
Remote:
  Actor           Partner Priority Oper-Key  SystemID              Flag
--------------------------------------------------------------------------------
  GE1/0/26          32      32768    2          0x8000, 000f-e267-57ad {ACDEF}
  GE1/0/32          26      32768    2          0x8000, 000f-e267-57ad {ACDEF}
```

Display detailed information about the aggregation group corresponding to Layer 2 aggregate interface Bridge-Aggregation 2, which is a static aggregation group.

```
<Sysname> display link-aggregation verbose bridge-aggregation 2
Loadsharing Type: Shar -- Loadsharing, NonS -- Non-Loadsharing
Port Status: S -- Selected, U -- Unselected
Flags:  A -- LACP_Activity, B -- LACP_Timeout, C -- Aggregation,
        D -- Synchronization, E -- Collecting, F -- Distributing,
        G -- Defaulted, H -- Expired

Aggregation Interface: Bridge-Aggregation2
Aggregation Mode: Static
```

```
Loadsharing Type: NonS
  Port            Status  Priority  Oper-Key
--------------------------------------------------------------------
  GE1/0/21          U       32768     1
  GE1/0/22          U       32768     1
  GE1/0/23          U       63        1
```

Table 21 Command output

Field	Description
Loadsharing Type	Load sharing type: • Shar—Load sharing. • NonS—Non-load sharing.
Port Status	Port state: Selected or Unselected.
Flags	LACP state flags: • **A**—LACP is enabled. • **B**—Indicates the LACP short timeout. • **C**—The sending system detects that the link is aggregatable. • **D**—The sending system detects that the link is synchronized. • **E**—The sending system detects that the incoming frames are collected. • **F**—The sending system detects that the outgoing frames are distributed. • **G**—The sending system receives frames in the default state. • **H**—The sending system receives frames in the expired state.
Aggregation Interface	Name of the aggregate interface.
Aggregation Mode	Mode of the aggregation group: • Static for static aggregation. • Dynamic for dynamic aggregation.
System ID	Local system ID, comprising the system LACP priority and the system MAC address.
Local	Information about the local end.
Port	Port type and number.
Status	Port state: selected or unselected.
Priority	Port aggregation priority.
Oper-Key	Operational key.
Flag	LACP protocol state flag.
Remote	Information about the remote end.
Actor	Local port type and number.
Partner	Remote port index.

enable snmp trap updown

Syntax

enable snmp trap updown

undo enable snmp trap updown

View

Layer 2 aggregate interface view

Default level

2: System level

Parameters

None

Description

Use **enable snmp trap updown** to enable linkUp/linkDown trap generation for the aggregate interface.

Use **undo enable snmp trap updown** to disable linkUp/linkDown trap generation for the aggregate interface.

By default, linkUp/linkDown trap generation is enabled for an aggregate interface.

For an aggregate interface to generate linkUp/linkDown traps when its link state changes, you must also enable linkUp/linkDown trap generation globally with the **snmp-agent trap enable** [**standard** [**linkdown** | **linkup**] *] command.

For more information about the **snmp-agent trap enable** command, see *Network Management and Monitoring Command Reference*.

Examples

\# Enable linkUp/linkDown trap generation on Layer 2 aggregate interface Bridge-Aggregation 1.

```
<Sysname> system-view
[Sysname] snmp-agent trap enable
[Sysname] interface bridge-aggregation 1
[Sysname-Bridge-Aggregation1] enable snmp trap updown
```

interface bridge-aggregation

Syntax

interface bridge-aggregation *interface-number*

undo interface bridge-aggregation *interface-number*

View

System view

Default level

2: System level

Parameters

interface-number: Specifies a Layer 2 aggregate interface by its number, in the range of 1 to 128.

Description

Use **interface bridge-aggregation** to create a Layer 2 aggregate interface and enter the Layer 2 aggregate interface view.

Use **undo interface bridge-aggregation** to remove a Layer 2 aggregate interface.

When you create a Layer 2 aggregate interface, a Layer 2 aggregation group with the same number is automatically created. If you remove the Layer 2 aggregate interface, you also remove the Layer 2 aggregation group, and any member ports will leave the aggregation group.

Examples

Create Layer 2 aggregate interface Bridge-Aggregation 1 and enter its view.

```
<Sysname> system-view
[Sysname] interface bridge-aggregation 1
[Sysname-Bridge-Aggregation1]
```

lacp period short

Syntax

lacp period short

undo lacp period

View

Ethernet interface view

Default level

2: System level

Parameters

None

Description

Use **lacp period short** to set the LACP timeout interval on a port to the short timeout interval (1 second).

Use **undo lacp period** to restore the default setting.

The default LACP timeout interval is the long timeout interval (30 seconds).

Examples

Set the LACP timeout interval on GigabitEthernet 1/0/1 to the short timeout interval (1 second).

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] lacp period short
```

lacp system-priority

Syntax

lacp system-priority *system-priority*

undo lacp system-priority

View

System view

Default level

2: System level

Parameters

system-priority: Specifies the LACP priority of the local system, in the range of 0 to 65535. The smaller the value, the higher the system LACP priority.

Description

Use **lacp system-priority** to set the LACP priority of the local system.

Use **undo lacp system-priority** to restore the default setting.

By default, the system LACP priority is 32768.

Examples

Set the system LACP priority to 64.

```
<Sysname> system-view
[Sysname] lacp system-priority 64
```

link-aggregation lacp traffic-redirect-notification enable

Syntax

link-aggregation lacp traffic-redirect-notification enable

undo link-aggregation lacp traffic-redirect-notification enable

View

System view

Default level

2: System level

Parameters

None

Description

Use **link-aggregation lacp traffic-redirect-notification enable** to enable link-aggregation traffic redirection.

Use **undo link-aggregation lacp traffic-redirect-notification enable** to disable link-aggregation traffic redirection.

By default, link-aggregation traffic redirection is disabled.

Link-aggregation traffic redirection applies only to dynamic link aggregation groups.

To prevent traffic interruption, enable link-aggregation traffic redirection on devices at both ends of the aggregate link.

Do not enable both MSTP and link-aggregation traffic redirection at the same time, because light packet loss may occur when the device reboots.

After link-aggregation traffic redirection is enabled, do not add an Ethernet interface configured with physical state change suppression to an aggregation group. Otherwise, Selected ports in the aggregation group might work improperly. For more information about physical state change suppression, see the **link-delay** command in "Ethernet interface configuration commands."

Examples

Enable link-aggregation traffic redirection.

```
<Sysname> system-view
[Sysname] link-aggregation lacp traffic-redirect-notification enable
```

link-aggregation load-sharing mode

Syntax

In system view:

link-aggregation load-sharing mode { **destination-ip** | **destination-mac** | **destination-port** | **ingress-port** | **source-ip** | **source-mac** | **source-port** } *

undo link-aggregation load-sharing mode

In Layer 2 aggregate interface view:

link-aggregation load-sharing mode { **destination-ip** | **destination-mac** | **source-ip** | **source-mac** } *

undo link-aggregation load-sharing mode

View

System view, Layer 2 aggregate interface view

Default level

2: System level

Parameters

destination-ip: Performs load sharing in link aggregation groups based on destination IP address.

destination-mac: Performs load sharing in link aggregation groups based on destination MAC address.

destination-port: Performs load sharing in link aggregation groups based on destination port.

ingress-port: Performs load sharing in link aggregation groups based on ingress port.

source-ip: Performs load sharing in link aggregation groups based on source IP address.

source-mac: Performs load sharing in link aggregation groups based on source MAC address.

source-port: Performs load sharing in link aggregation groups based on source port.

Description

Use **link-aggregation load-sharing mode** to configure the global or group-specific link-aggregation load sharing criteria.

Use **undo link-aggregation load-sharing mode** to restore the default setting.

By default, the system selects the load sharing criteria according to the packet type, and the group-specific link-aggregation load sharing criteria are the same as the global ink-aggregation load sharing criteria.

This command applies to only unicast packets, and can change the load sharing criteria for unicast packets. Broadcast packets and multicast packets always use the default load sharing criteria.

The load sharing criteria that you configure will overwrite the previous criteria.

If unsupported load sharing criteria are configured, an error prompt will appear.

In system view, the switch supports the following load sharing criteria and combinations:

- Load-sharing criteria automatically determined based on the packet type
- Source IP address

- Destination IP address
- Source MAC address
- Destination MAC address
- Source IP address and destination IP address
- Source IP address and source port
- Destination IP address and destination port
- Source IP address, source port, destination IP address, and destination port
- Any combination of incoming port, source MAC address, and destination MAC address

In Layer 2 aggregate interface view, the switch supports the following load sharing criteria and combinations:

- Load-sharing criteria automatically determined based on the packet type
- Source IP address
- Destination IP address
- Source MAC address
- Destination MAC address
- Destination IP address and source IP address
- Destination MAC address and source MAC address

Examples

Configure the destination MAC address as the global link-aggregation load sharing criterion.

```
<Sysname> system-view
[Sysname] link-aggregation load-sharing mode destination-mac
```

Configure the destination MAC address as the load sharing criterion specific to the link aggregation group of aggregate interface Bridge-Aggregation 1.

```
<Sysname> system-view
[Sysname] interface bridge-aggregation 1
[Sysname-Bridge-Aggregation1] link-aggregation load-sharing mode destination-mac
```

link-aggregation load-sharing mode local-first

Syntax

link-aggregation load-sharing mode local-first

undo link-aggregation load-sharing mode local-first

View

System view

Default level

2: System level

Parameters

None

Description

Use **link-aggregation load-sharing mode local-first** to enable local-first load sharing for link aggregation.

Use **undo link-aggregation load-sharing mode local-first** to disable local-first load sharing for link aggregation. After you disable local-first load sharing for link aggregation, the packets to be forwarded out of an aggregate interface will be load-shared among all Selected ports of the aggregate interface on all IRF member devices.

By default, local-first load sharing is enabled for link aggregation.

Local-first load sharing for link aggregation takes effect on only known unicast packets.

Examples

Disable local-first load sharing for link aggregation.

```
<Sysname> system-view
[Sysname] undo link-aggregation load-sharing mode local-first
```

link-aggregation mode

Syntax

link-aggregation mode dynamic

undo link-aggregation mode

View

Layer 2 aggregate interface view

Default level

2: System level

Parameters

None

Description

Use the **link-aggregation mode dynamic** command to configure an aggregation group to operate in dynamic aggregation mode.

Use **undo link-aggregation mode** to restore the default setting.

By default, an aggregation group operates in static aggregation mode.

To change the aggregation mode of an aggregation group that contains member ports, remove all the member ports from the aggregation group first.

Examples

Configure the aggregation group corresponding to Bridge-Aggregation 1 to operate in dynamic aggregation mode.

```
<Sysname> system-view
[Sysname] interface bridge-aggregation 1
[Sysname-Bridge-Aggregation1] link-aggregation mode dynamic
```

link-aggregation port-priority

Syntax

link-aggregation port-priority *port-priority*

undo link-aggregation port-priority

View

Ethernet interface view

Default level

2: System level

Parameters

port-priority: Specifies a port aggregation priority, in the range of 0 to 65535. The smaller the value, the higher the port aggregation priority.

Description

Use **link-aggregation port-priority** to set the aggregation priority of a port.

Use **undo link-aggregation port-priority** to restore the default setting.

The default aggregation priority of a port is 32768.

Examples

Set the aggregation priority of port GigabitEthernet 1/0/1 to 64.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] link-aggregation port-priority 64
```

link-aggregation selected-port maximum

Syntax

link-aggregation selected-port maximum *number*

undo link-aggregation selected-port maximum

View

Layer 2 aggregate interface view

Default level

2: System level

Parameters

number: Specifies the maximum number of Selected ports allowed in an aggregation group. This argument ranges from 1 to 8.

Description

Use **link-aggregation selected-port maximum** to configure the maximum number of Selected ports allowed in the aggregation group.

Use **undo link-aggregation selected-port maximum** to restore the default setting.

By default, the maximum number of Selected ports allowed in an aggregation group depends on only the hardware capabilities of the member ports.

Executing this command may cause some of the member ports in the aggregation group to become unselected.

The maximum numbers of Selected ports for the local and peer aggregation groups must be consistent.

Examples

\# Configure the maximum number of Selected ports as 3 in the aggregation group corresponding to Layer 2 aggregate interface Bridge-Aggregation 1.

```
<Sysname> system-view
[Sysname] interface bridge-aggregation 1
[Sysname-Bridge-Aggregation1] link-aggregation selected-port maximum 3
```

link-aggregation selected-port minimum

Syntax

link-aggregation selected-port minimum *number*

undo link-aggregation selected-port minimum

View

Layer 2 aggregate interface view

Default level

2: System level

Parameters

number: Specifies the minimum number of Selected ports in an aggregation group required to bring up the aggregate interface. This argument ranges from 1 to 8.

Description

Use **link-aggregation selected-port minimum** to configure the minimum number of Selected ports in the aggregation group.

Use **undo link-aggregation selected-port minimum** to restore the default setting.

By default, the minimum number of Selected ports in an aggregation group is not specified.

Executing this command may cause all the member ports in the aggregation group to become unselected.

The minimum numbers of Selected ports for the local and peer aggregation groups must be consistent.

Examples

\# Configure the minimum number of Selected ports as 3 in the aggregation group corresponding to Layer 2 aggregate interface Bridge-Aggregation 1.

```
<Sysname> system-view
[Sysname] interface bridge-aggregation 1
[Sysname-Bridge-Aggregation1] link-aggregation selected-port minimum 3
```

port link-aggregation group

Syntax

port link-aggregation group *number*

undo port link-aggregation group

View

Ethernet interface view

Default level

2: System level

Parameters

number: Specifies the number of the aggregate interface corresponding to an aggregation group. The *number* argument ranges from 1 to 128.

Description

Use **port link-aggregation group** to assign the Ethernet interface to the specified aggregation group.

Use **undo port link-aggregation group** to remove the Ethernet interface from the aggregation group to which it belongs.

An Ethernet interface can belong to only one aggregation group.

Examples

Assign Layer 2 Ethernet interface GigabitEthernet 1/0/1 to Layer 2 aggregation group 1.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] port link-aggregation group 1
```

reset counters interface

Syntax

reset counters interface [**bridge-aggregation** [*interface-number*]]

View

User view

Default level

2: System level

Parameters

bridge-aggregation: Clears statistics for Layer 2 aggregate interfaces.

interface-number: Specifies an aggregate interface number. If the *interface-number* argument is not specified, this command clears statistics of all aggregate interfaces of the specified type.

Description

Use **reset counters interface** to clear the statistics of the specified aggregate interface or interfaces.

Before collecting statistics for a Layer 2 aggregate interface within a specific period, clear the existing statistics of the interface.

- If no keywords or argument is specified, the command clears the statistics of all interfaces in the system.
- If only the **bridge-aggregation** keyword is specified, the command clears the statistics of all Layer 2 aggregate interfaces.
- If the **bridge-aggregation** *interface-number* keyword and argument combination is specified, the command clears the statistics of the specified Layer 2 aggregate interface.
- The **bridge-aggregation** keyword becomes available only after you create Layer 2 aggregate interfaces on the device.

Examples

Clear the statistics of Layer 2 aggregate interface Bridge-Aggregation 1.

```
<Sysname> reset counters interface bridge-aggregation 1
```

reset lacp statistics

Syntax

reset lacp statistics [**interface** *interface-list*]

View

User view

Default level

1: Monitor level

Parameters

interface-list: Specifies a list of link aggregation member ports, in the format *interface-type interface-number* [**to** *interface-type interface-number*], where *interface-type interface-number* indicates the port type and port number.

Description

Use **reset lacp statistics** to clear the LACP statistics on the specified member ports or all member ports, if no member ports are specified.

Related commands: **display link-aggregation member-port**.

Examples

Clear the LACP statistics on all link aggregation member ports.

```
<Sysname> reset lacp statistics
```

shutdown

Syntax

shutdown

undo shutdown

View

Layer 2 aggregate interface view

Default level

2: System level

Parameters

None

Description

Use **shutdown** to shut down the aggregate interface.

Use **undo shutdown** to bring up the aggregate interface.

By default, aggregate interfaces are up.

Examples

\# Shut down Layer 2 aggregate interface Bridge-Aggregation 1.

```
<Sysname> system-view
[Sysname] interface bridge-aggregation 1
[Sysname-Bridge-Aggregation1] shutdown
```

Port isolation configuration commands

display port-isolate group

Syntax

> **display port-isolate group** [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

> Any view

Default level

> 1: Monitor level

Parameters

> **|**: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.
>
> **begin**: Displays the first line that matches the specified regular expression and all lines that follow.
>
> **exclude**: Displays all lines that do not match the specified regular expression.
>
> **include**: Displays all lines that match the specified regular expression.
>
> *regular-expression*: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

> Use **display port-isolate group** to display port isolation group information.

Examples

> \# Display port isolation group information.
> ```
> <Sysname> display port-isolate group
>  Port-isolate group information:
>  Uplink port support: NO
>  Group ID: 1
>  Group members:
>     GigabitEthernet1/0/2
> ```

Table 22 Command output

Field	Description
Port-isolate group information	Display port isolation group information.
Uplink port support	Indicates whether the device supports configuring an uplink port in the port isolation group.
Group ID	Isolation group number. It can only be 1.
Group members	Isolated ports in the isolation group.

port-isolate enable

Syntax

port-isolate enable

undo port-isolate enable

View

Layer 2 Ethernet interface view, Layer 2 aggregate interface view, port group view

Default level

2: System level

Parameters

None

Description

Use **port-isolate enable** to assign a port to an isolation group.

Use **undo port-isolate enable** to remove a port from the isolation group.

- To assign Ethernet ports to the isolation group one by one, perform the command in Ethernet interface view.
- To bulk assign Ethernet ports to the isolation group, perform the command in port group view.
- To assign a Layer 2 aggregate interface to the isolation group, perform the command in Layer 2 aggregate interface view. The configuration applies to the Layer 2 aggregate interface and all its member ports. If the switch fails to apply the **port-isolate enable** command to a Layer 2 aggregate interface, it does not assign any member port of the aggregate interface to the isolation group. If the failure occurs on a member port, the switch can still assign other member ports to the isolation group. For more information about Layer 2 aggregate interfaces, see *Layer 2—LAN Switching Configuration Guide*.

Examples

Assign ports GigabitEthernet 1/0/1 and GigabitEthernet 1/0/2 to the isolation group.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] port-isolate enable
[Sysname-GigabitEthernet1/0/1] quit
[Sysname] interface gigabitethernet 1/0/2
[Sysname-GigabitEthernet1/0/2] port-isolate enable
```

Assign all ports in port group **aa** to the isolation group.

```
<Sysname> system-view
[Sysname] port-group manual aa
[Sysname-port-group-manual-aa] group-member gigabitethernet 1/0/1
[Sysname-port-group-manual-aa] group-member gigabitethernet 1/0/2
[Sysname-port-group-manual-aa] group-member gigabitethernet 1/0/3
[Sysname-port-group-manual-aa] group-member gigabitethernet 1/0/4
[Sysname-port-group-manual-aa] port-isolate enable
```

Assign Layer 2 aggregate interface Bridge-Aggregation 1 to the isolation group.

```
<Sysname> system-view
```

```
[Sysname] interface bridge-aggregation 1
[Sysname-Bridge-Aggregation1] quit
[Sysname] interface GigabitEthernet 1/0/1
[Sysname-GigabitEthernet1/0/1] port link-aggregation group 1
[Sysname-GigabitEthernet1/0/1] quit
[Sysname] interface GigabitEthernet 1/0/2
[Sysname-GigabitEthernet1/0/2] port link-aggregation group 1
[Sysname-GigabitEthernet1/0/2] quit
[Sysname] interface bridge-aggregation 1
[Sysname-Bridge-Aggregation1] port-isolate enable
```

Spanning tree configuration commands

active region-configuration

Syntax

active region-configuration

View

MST region view

Default level

2: System level

Parameters

None

Description

Use **active region-configuration** to activate your MST region configuration.

When you configure MST region–related parameters, MSTP launches a new spanning tree calculation process that may cause network topology instability. This is mostly likely to occur when you configure the VLAN-to-instance mapping table. The launch will only occur after you activate the MST region–related parameters by using **active region-configuration** command or enable MSTP by using the **stp enable** command.

HP recommends that you use the **check region-configuration** command to determine whether the MST region configurations to be activated are correct. Run this command only when they are correct.

Related commands: **instance**, **region-name**, **revision-level**, **vlan-mapping modulo**, and **check region-configuration**.

Examples

Map VLAN 2 to MSTI 1 and manually activate the MST region configuration.

```
<Sysname> system-view
[Sysname] stp region-configuration
[Sysname-mst-region] instance 1 vlan 2
[Sysname-mst-region] active region-configuration
```

bpdu-drop any

Syntax

bpdu-drop any

undo bpdu-drop any

View

Ethernet interface view

Default level

2: System level

Parameters

None

Description

Use **bpdu-drop any** to enable BPDU drop on a port.

Use **undo bpdu-drop any** to disable BPDU drop on a port.

By default, BPDU drop is disabled on a port.

Examples

Enable BPDU drop on port GigabitEthernet 1/0/1.
```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] bpdu-drop any
```

check region-configuration

Syntax

check region-configuration

View

MST region view

Default level

2: System level

Parameters

None

Description

Use **check region-configuration** to display MST region pre-configuration information, including the region name, revision level, and VLAN-to-instance mapping settings.

Two or more spanning tree devices belong to the same MST region only if they are configured with the same format selector (0 by default, not configurable), MST region name, MST region revision level, and the same VLAN-to-instance mapping entries in the MST region, and if they are connected by a physical link.

HP recommends that you use this command to determine whether the MST region configurations to be activated are correct. Activate them only when they are correct.

Related commands: **instance**, **region-name**, **revision-level**, **vlan-mapping modulo**, and **active region-configuration**.

Examples

Display MST region pre-configurations.
```
<Sysname> system-view
[Sysname] stp region-configuration
[Sysname-mst-region] check region-configuration
Admin Configuration
   Format selector      :0
   Region name          :000fe26a58ed
   Revision level       :0
```

```
   Configuration digest :0x41b5018aca57daa8dcfdba2984d99d06

   Instance    Vlans Mapped
      0        1 to 9, 11 to 4094
     15        10
```

Table 23 Command output

Field	Description
Format selector	Format selector of the MST region, which is 0 (not configurable).
Region name	MST region name.
Revision level	Revision level of the MST region.
Instance Vlans Mapped	VLAN-to-instance mappings in the MST region.

display stp

Syntax

display stp [**instance** *instance-id* | **vlan** *vlan-id*] [**interface** *interface-list* | **slot** *slot-number*] [**brief**] [| { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

1: Monitor level

Parameters

instance *instance-id*: Displays the status and statistics of a specific MSTI. The value of *instance-id* ranges from 0 to 16, where 0 represents the common internal spanning tree (CIST).

vlan *vlan-id*: Displays the spanning tree status and statistics of a VLAN specified by *vlan-id*, in the range of 1 to 4094.

interface *interface-list*: Displays the spanning tree status and statistics on the ports specified by a port list, in the format of *interface-list* = { *interface-type* *interface-number* [**to** *interface-type* *interface-number*] }&<1-10>, where &<1-10> indicates that you can specify up to 10 ports or port ranges.

slot *slot-number*: Displays the MSTP status and statistics on the specified IRF member switch. *slot-number* represents the member number of the device in the IRF. If this keyword-argument combination is not specified, this command displays the MSTP status and statistics on all IRF member switches.

brief: Displays brief spanning tree status and statistics.

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display stp** to display the spanning tree status and statistics.

Based on the spanning tree status and statistics, you can analyze and maintain the network topology or check whether spanning tree is working properly.

In STP/RSTP mode, follow these guidelines:

- If you do not specify any port, this command displays the spanning tree information for all ports. The displayed information is sorted by port name.
- If you specify a port list, this command displays the spanning tree information for the specified ports. The displayed information is sorted by port name.

In MSTP mode, follow these guidelines:

- If you do not specify any MSTI or port, this command displays the spanning tree information of all MSTIs on all ports. The displayed information is sorted by MSTI ID and by port name in each MSTI.
- If you specify an MSTI but not a port, this command displays the spanning tree information on all ports in that MSTI. The displayed information is sorted by port name.
- If you specify some ports but not an MSTI, this command displays the spanning tree information of all MSTIs on the specified ports. The displayed information is sorted by MSTI ID and by port name in each MSTI.
- If you specify both an MSTI ID and a port list, this command displays the spanning tree information on the specified ports in the specified MSTI. The displayed information is sorted by port name.

In PVST mode, follow these guidelines:

- If you do not specify any VLAN or port, this command displays the spanning tree information of all VLANs on all ports. The displayed information is sorted by VLAN ID and by port name in each VLAN.
- If you specify a VLAN but not a port, this command displays the spanning tree information on all ports in that VLAN. The displayed information is sorted by port name.
- If you specify some ports but not any VLAN, this command displays the spanning tree information of all VLANs on the specified ports. The displayed information is sorted by VLAN ID, and by port name in each VLAN.
- If you specify both a VLAN ID and a port list, this command displays the spanning tree information on the specified ports in the specified VLAN. The displayed information is sorted by port name.

Related commands: **reset stp**.

Examples

In MSTP mode, display the brief spanning tree status and statistics of MSTI 0 on ports GigabitEthernet 1/0/1 through GigabitEthernet 1/0/4.

```
<Sysname> display stp instance 0 interface gigabitethernet 1/0/1 to gigabitethernet 1/0/4
brief
 MSTID      Port                         Role  STP State     Protection
   0        GigabitEthernet1/0/1         ALTE  DISCARDING    LOOP
   0        GigabitEthernet1/0/2         DESI  FORWARDING    NONE
   0        GigabitEthernet1/0/3         DESI  FORWARDING    NONE
   0        GigabitEthernet1/0/4         DESI  FORWARDING    NONE
```

In PVST mode, display the brief spanning tree status and statistics of VLAN 2 on ports GigabitEthernet 1/0/1 through GigabitEthernet 1/0/4.

```
<Sysname> system-view
```

```
[Sysname] stp mode pvst
[Sysname] display stp vlan 2 interface gigabitethernet 1/0/1 to gigabitethernet 1/0/4 brief
 VLAN      Port                        Role  STP State    Protection
    2      GigabitEthernet1/0/1        ALTE  DISCARDING   LOOP
    2      GigabitEthernet1/0/2        DESI  FORWARDING   NONE
    2      GigabitEthernet1/0/3        DESI  FORWARDING   NONE
    2      GigabitEthernet1/0/4        DESI  FORWARDING   NONE
```

Table 24 Command output

Field	Description
MSTID	MSTI ID in the MST region.
Port	Port name, corresponding to each MSTI or VLAN.
Role	Port role: • **ALTE**—The port is an alternate port. • **BACK**—The port is a backup port. • **ROOT**—The port is a root port. • **DESI**—The port is a designated port. • **MAST**—The port is a master port. • **DISA**—The port is disabled.
STP State	Spanning tree status on the port: • **FORWARDING**—The port can receive and send BPDUs, and also forward user traffic. • **DISCARDING**—The port can receive and send BPDUs, but cannot forward user traffic. • **LEARNING**—The port is in a transitional state. It can receive and send BPDUs, but cannot forward user traffic.
Protection	Protection type on the port: • **ROOT**—Root guard. • **LOOP**—Loop guard. • **BPDU**—BPDU guard. • **BPDU/ROOT**—BPDU guard and root guard. • **NONE**—No protection.

In MSTP mode, display the spanning tree status and statistics of all MSTIs on all ports.

```
<Sysname> display stp
-------[CIST Global Info][Mode MSTP]-------
CIST Bridge          :32768.000f-e200-2200
Bridge Times         :Hello 2s MaxAge 20s FwDly 15s MaxHop 20
CIST Root/ERPC       :0.00e0-fc0e-6554 / 200200
CIST RegRoot/IRPC    :32768.000f-e200-2200 / 0
CIST RootPortId      :128.48
BPDU-Protection      :disabled
Bridge Config-
Digest-Snooping      :disabled
TC or TCN received   :2
Time since last TC   :0 days 0h:5m:42s
```

```
      ----[Port1(GigabitEthernet1/0/1)][FORWARDING]----
 Port Protocol         :enabled
 Port Role             :CIST Designated Port
 Port Priority         :128
 Port Cost(Legacy)     :Config=auto / Active=200
 Desg. Bridge/Port     :32768.000f-e200-2200 / 128.2
 Port Edged            :Config=disabled / Active=disabled
 Point-to-point        :Config=auto / Active=true
 Transmit Limit        :10 packets/hello-time
 Protection Type       :None
 MST BPDU Format       :Config=auto / Active=legacy
 Port Config-
 Digest-Snooping       :disabled
 Rapid transition      :false
 Num of Vlans Mapped :1
 PortTimes             :Hello 2s MaxAge 20s FwDly 15s MsgAge 2s RemHop 20
 BPDU Sent             :186
          TCN: 0, Config: 0, RST: 0, MST: 186
 BPDU Received         :0
          TCN: 0, Config: 0, RST: 0, MST: 0


-------[MSTI 1 Global Info]-------
MSTI Bridge ID       :0.000f-e23e-9ca4
MSTI RegRoot/IRPC    :0.000f-e23e-9ca4 / 0
MSTI RootPortId      :0.0
MSTI Root Type       :PRIMARY root
Master Bridge        :32768.000f-e23e-9ca4
Cost to Master       :0
TC received          :0
```

In PVST mode, display the spanning tree status and statistics of all VLANs on all ports.

```
<Sysname> system-view
[Sysname] stp mode pvst
[Sysname] display stp
-------[VLAN 1 Global Info]-------
Protocol Status     :enabled
Bridge ID           :32768.000f-e200-2200
Bridge Times        :Hello 2s MaxAge 20s FwDly 15s
Root ID / RPC       :0.00e0-fc0e-6554 / 200200
Root PortId         :128.48
BPDU-Protection     :disabled
TC or TCN received  :2
Time since last TC  :0 days 0h:5m:42s


 ----[Port1(GigabitEthernet1/0/1)][FORWARDING]----
 Port Protocol         :enabled
 Port Role             :Designated Port
 Port Priority         :128
 Port Cost(Legacy)     :Config=auto / Active=200
```

```
Desg. Bridge/Port    :32768.000f-e200-2200 / 128.2
Port Edged           :Config=disabled / Active=disabled
Point-to-point       :Config=auto / Active=true
Transmit Limit       :10 packets/hello-time
Protection Type      :None
Rapid transition     :false
PortTimes            :Hello 2s MaxAge 20s FwDly 15s MsgAge 2s
BPDU Sent            :186
       TCN: 0, Config: 0, RST: 0
BPDU Received        :0
       TCN: 0, Config: 0, RST: 0, MST: 0


-------[VLAN 2 Global Info]-------
Protocol Status      :enabled
Bridge ID            :32768.000f-e200-2200
Bridge Times         :Hello 2s MaxAge 20s FwDly 15s
Root ID / RPC        :0.00e0-fc0e-6554 / 200200
Root PortId          :128.48
BPDU-Protection      :disabled
TC or TCN received   :2
Time since last TC   :0 days 0h:5m:42s
```

\# Display the spanning tree status and statistics when the spanning tree feature is disabled.

```
<Sysname> display stp
 Protocol Status    :disabled
 Protocol Std.      :IEEE 802.1s
 Version            :3
 Bridge-Prio.       :32768
 MAC address        :000f-e200-8048
 Max age(s)         :20
 Forward delay(s)   :15
 Hello time(s)      :2
 Max hops           :20
```

Table 25 Command output

Field	Description
CIST Bridge	CIST bridge ID, which comprises the device's priority in the CIST and its MAC address. For example, in output "32768.000f-e200-2200", the value preceding the dot is the device's priority in the CIST, and the value following the dot is the device's MAC address.
Bridge ID	Bridge ID, which comprises the device's priority in VLAN 1 and its MAC address. For example, in output "32768.000f-e200-2200", the value preceding the dot is the device's priority in VLAN 1, and the value following the dot is the device's MAC address.

Field	Description
Bridge Times	Major parameters for the bridge: • **Hello**—Hello timer. • **MaxAge**—Max age timer. • **FwDly**—Forward delay timer. • **MaxHop**—Max hops within the MST region.
CIST Root/ERPC	CIST root ID and external path cost (the path cost from the device to the CIST root).
CIST RegRoot/IRPC	CIST regional root ID and internal path cost (the path cost from the device to the CIST regional root).
Root ID / RPC	VLAN root ID and root path cost (the path cost from the device to the root).
CIST RootPortId	CIST root port ID. "0.0" indicates that the device is the root and there is no root port.
Root PortId	VLAN root port ID. "0.0" indicates that the device is the root and there is no root port.
BPDU-Protection	Global status of BPDU protection.
Bridge Config-Digest-Snooping	Global status of Digest Snooping.
TC or TCN received	Number of TC/TCN BPDUs received in the MSTI or VLAN.
Time since last TC	Time since the latest topology change in the MSTI or VLAN.
[FORWARDING]	The port is in forwarding state.
[DISCARDING]	The port is in discarding state.
[LEARNING]	The port is in learning state.
Port Protocol	Status of the spanning tree feature on the port.
Port Role	Port role, which can be Alternate, Backup, Root, Designated, Master, or Disabled.
Port Cost(Legacy)	Path cost of the port. The field in parentheses indicates the standard (legacy, dot1d-1998, or dot1t) used for port path cost calculation. • **Config**—Configured value. • **Active**—Actual value.
Desg. Bridge/Port	Designated bridge ID and port ID of the port. The port ID displayed is insignificant for a port which does not support port priority.
Port Edged	The port is an edge port or non-edge port. • **Config**—Configured value. • **Active**—Actual value.
Point-to-point	The port is connected to a point-to-point link or not. • **Config**—Configured value. • **Active**—Actual value.
Transmit Limit	Maximum number of packets sent within each hello time.

Field	Description
Protection Type	Protection type on the port: • **Root**—Root guard. • **Loop**—Loop guard. • **BPDU**—BPDU guard. • **BPDU/ROOT**—BPDU guard and root guard. • **None**—No protection.
MST BPDU Format	Format of the MST BPDUs that the port can send, which can be legacy or 802.1s. • **Config**—Configured value. • **Active**—Actual value.
Port Config- Digest-Snooping	Status of Digest Snooping on the port.
Rapid transition	The port rapidly transits to the forwarding state or not in the MSTI or VLAN.
Num of Vlans Mapped	Number of VLANs mapped to the MSTI.
PortTimes	Major parameters for the port: • **Hello**—Hello timer. • **MaxAge**—Max Age timer. • **FwDly**—Forward delay timer. • **MsgAge**—Message Age timer. • **RemHop**—Remaining hops.
BPDU Sent	Statistics on sent BPDUs.
BPDU Received	Statistics on received BPDUs.
MSTI RegRoot/IRPC	MSTI regional root/internal path cost.
MSTI RootPortId	MSTI root port ID.
MSTI Root Type	MSTI root type, which can be **primary root** or **secondary root**.
Master Bridge	MSTI root bridge ID.
Cost to Master	Path cost from the MSTI to the master bridge.
TC received	Number of received TC BPDUs.
Protocol Status	Spanning tree protocol status.
Protocol Std.	Spanning tree protocol standard.
Version	Spanning tree protocol version.
Bridge-Prio.	In MSTP mode, this field indicates the device's priority in the CIST. In PVST mode, this field indicates the device's priority in VLAN 1.
Max age(s)	Aging timer (in seconds) for BPDUs. In PVST mode, this field is the configuration in VLAN 1.
Forward delay(s)	Port state transition delay (in seconds). In PVST mode, this field is the configuration in VLAN 1.
Hello time(s)	Interval (in seconds) for the root bridge to send BPDUs. In PVST mode, this field is the configuration in VLAN 1.
Max hops	Maximum hops in the MSTI.

display stp abnormal-port

Syntax

display stp abnormal-port [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

1: Monitor level

Parameters

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display stp abnormal-port** to display information about ports blocked by spanning tree protection functions.

Examples

In MSTP mode, display information about ports blocked by spanning tree protection functions.

```
<Sysname> display stp abnormal-port
 MSTID      Blocked Port              Reason
   1        GigabitEthernet1/0/1      ROOT-Protected
   2        GigabitEthernet1/0/2      LOOP-Protected
   2        GigabitEthernet1/0/3      Formatcompatibility-Protected
```

In PVST mode, display information about ports blocked by spanning tree protection functions.

```
<Sysname> system-view
[Sysname] stp mode pvst
[Sysname] display stp abnormal-port
 VLAN       Blocked Port              Reason
   1        GigabitEthernet1/0/1      ROOT-Protected
   2        GigabitEthernet1/0/2      LOOP-Protected
   2        GigabitEthernet1/0/3      Formatcompatibility-Protected
```

Table 26 Command output

Field	Description
Blocked Port	Name of a blocked port, which corresponds to the related MSTI or VLAN.

Field	Description
Reason	Reason that the port was blocked: • **ROOT-Protected**—Root guard function. • **LOOP-Protected**—Loop guard function. • **Formatcompatibility-Protected**—MSTP BPDU format incompatibility protection function. • **InconsistentPortType-Protected**—Port type inconsistent protection function. • **InconsistentPvid-Protected**—PVID inconsistent protection function.

display stp bpdu-statistics

Syntax

display stp bpdu-statistics [**interface** *interface-type interface-number* [**instance** *instance-id*]] [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

1: Monitor level

Parameters

interface *interface-type interface-number*: Displays the BPDU statistics on a specified port, where *interface-type interface-number* indicates the port type and number.

instance *instance-id*: Displays the BPDU statistics of a specified MSTI on a specified port. The value of *instance-id* ranges from 0 to 16, where 0 represents the CIST.

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display stp bpdu-statistics** to display the BPDU statistics on ports.

In MSTP mode, follow these guidelines:

• If you do not specify any MSTI or port, this command displays the BPDU statistics of all MSTIs on all ports. The displayed information is sorted by port name and by MSTI ID on each port.

• If you specify a port but not an MSTI, this command displays the BPDU statistics of all MSTIs on the port. The displayed information is sorted by MSTI ID.

• If you specify both an MSTI ID and a port, this command displays the BPDU statistics of the specified MSTI on the port.

In STP, RSTP, or PVST mode, follow these guidelines:

• If you do not specify any port, this command displays the BPDU statistics of on all ports. The displayed information is sorted by port name.

- If you specify a port, this command displays the BPDU statistics on the port.

Examples

In MSTP mode, display the BPDU statistics of all MSTIs on GigabitEthernet 1/0/1.

```
<Sysname> display stp bpdu-statistics interface gigabitethernet 1/0/1
 Port: GigabitEthernet1/0/1

 Instance-independent:

 Type                       Count      Last Updated
 -------------------------- ---------- -----------------
 Invalid BPDUs              0
 Looped-back BPDUs          0
 MAX-aged BPDUs             0
 TCN sent                   0
 TCN received               0
 TCA sent                   0
 TCA received               2          10:33:12 01/13/2010
 Config sent                0
 Config received            0
 RST sent                   0
 RST received               0
 MST sent                   4          10:33:11 01/13/2010
 MST received               151        10:37:43 01/13/2010

 Instance 0:

 Type                       Count      Last Updated
 -------------------------- ---------- -----------------
 Timeout BPDUs              0
 MAX-hoped BPDUs            0
 TC detected                1          10:32:40 01/13/2010
 TC sent                    3          10:33:11 01/13/2010
 TC received                0

 Instance 1:

 Type                       Count      Last Updated
 -------------------------- ---------- -----------------
 Timeout BPDUs              0
 MAX-hoped BPDUs            0
 TC detected                0
 TC sent                    0
 TC received                0

 Instance 2:

 Type                       Count      Last Updated
 -------------------------- ---------- -----------------
```

```
Timeout BPDUs             0
MAX-hoped BPDUs           0
TC detected               0
TC sent                   0
TC received               0
```

In PVST mode, display the BPDU statistics on GigabitEthernet 1/0/1.

```
<Sysname> system-view
[Sysname] stp mode pvst
[Sysname] display stp bpdu-statistics interface gigabitethernet 1/0/1
 Port: GigabitEthernet1/0/1

 Type                       Count      Last Updated
 -------------------------- ---------- -----------------
 Invalid BPDUs             0
 Looped-back BPDUs         0
 MAX-aged BPDUs            0
 TCN sent                  0
 TCN received              0
 TCA sent                  0
 TCA received              2          10:33:12 01/13/2010
 Config sent               0
 Config received           0
 RST sent                  0
 RST received              0
 MST sent                  4          10:33:11 01/13/2010
 MST received              151        10:37:43 01/13/2010
 Timeout BPDUs             0
 MAX-hoped BPDUs           0
 TC detected               511        10:32:40 01/13/2010
 TC sent                   8844       10:33:11 01/13/2010
 TC received               1426       10:33:32 01/13/2010
```

Table 27 Command output

Field	Description
Port	Port name.
Instance-independent	Statistics not related to any particular MSTI.
Type	Statistical item.
Looped-back BPDUs	BPDUs sent and then received by the same port.
Max-Aged BPDUs	BPDUs whose max age was exceeded.
TCN Sent	TCN BPDUs sent.
TCN Received	TCN BPDUs received.
TCA Sent	TCA BPDUs sent.
TCA Received	TCA BPDUs received.
Config Sent	Configuration BPDUs sent.

Field	Description
Config Received	Configuration BPDUs received.
RST Sent	RSTP BPDUs sent.
RST Received	RSTP BPDUs received.
MST Sent	MSTP BPDUs sent.
MST Received	MSTP BPDUs received.
Instance	Statistical information for a particular MSTI.
Timeout BPDUs	Expired BPDUs.
Max-Hoped BPDUs	BPDUs whose maximum hops were exceeded.
TC Detected	TC BPDUs detected.
TC Sent	TC BPDUs sent.
TC Received	TC BPDUs received.

display stp down-port

Syntax

display stp down-port [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

1: Monitor level

Parameters

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display stp down-port** to display information about ports shut down by spanning tree protection functions.

Examples

Display information about ports shut down by spanning tree protection functions.
```
<Sysname> display stp down-port
Down Port                       Reason
GigabitEthernet1/0/1            BPDU-Protected
GigabitEthernet1/0/2            Formatfrequency-Protected
```

Table 28 Command output

Field	Description
Down Port	Name of a port shut down by the spanning tree protection functions.
Reason	Reason that the port was shut down: • **BPDU-Protected**—BPDU guard function. • **Formatfrequency-Protected**—MSTP BPDU format frequent change protection function.

display stp history

Syntax

display stp [**instance** *instance-id* | **vlan** *vlan-id*] **history** [**slot** *slot-number*] [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

0: Visit level

Parameters

instance *instance-id*: Displays the historical port role calculation information of a specific MSTI. The value of *instance-id* ranges from 0 to 16, where 0 represents the CIST.

vlan *vlan-id*: Displays the historical port role calculation information for a specific VLAN, in the range of 1 to 4094.

slot *slot-number*: Displays the historical port role calculation information on the specified IRF member switch. *slot-number* represents the number of the member number of the device in the IRF. If this keyword-argument combination is not specified, this command displays the historical port role calculation information on all IRF member switches.

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display stp history** to display the historical port role calculation information of the specified MSTI or all MSTIs.

In STP/RSTP mode, the displayed information is sorted by port role calculation time.

In MSTP mode, follow these guidelines:

• If you do not specify any MSTI, this command displays the historical port role calculation information of all MSTIs. The displayed information is sorted by MSTI ID and by port role calculation time in each MSTI.

- If you specify an MSTI, this command displays the historical port role calculation information of the specified MSTI by the sequence of port role calculation time.

In PVST mode, follow these guidelines:

- If you do not specify any VLAN, this command displays the historical port role calculation information of all VLANs. The displayed information is sorted by VLAN ID, and by port role calculation time in each VLAN.
- If you specify a VLAN, this command displays the historical port role calculation information of the specified VLAN by the sequence of port role calculation time.

Examples

In MSTP mode, display the historical port role calculation information of IRF member switch 1 in MSTI 2.

```
<Sysname> display stp instance 2 history slot 1
-------------- STP slot 1 history trace --------------
------------------  Instance 2   --------------------

 Port GigabitEthernet1/0/1
   Role change   : ROOT->DESI (Aged)
   Time          : 2009/02/08 00:22:56
   Port priority : 0.00e0-fc01-6510 0 0.00e0-fc01-6510 128.1


 Port GigabitEthernet1/0/2
   Role change   : ALTER->ROOT
   Time          : 2009/02/08 00:22:56
   Port priority : 0.00e0-fc01-6510 0 0.00e0-fc01-6510 128.2
```

In PVST mode, display the historical port role calculation information of IRF member switch 1 in VLAN 2.

```
<Sysname> system-view
[Sysname] stp mode pvst
[Sysname] display stp vlan 2 history slot 1
-------------- STP slot 1 history trace --------------
------------------  VLAN 2   --------------------

 Port GigabitEthernet1/0/1
   Role change   : ROOT->DESI (Aged)
   Time          : 2009/02/08 00:22:56
   Port priority : 0.00e0-fc01-6510 0 0.00e0-fc01-6510 128.1


 Port GigabitEthernet1/0/2
   Role change   : ALTER->ROOT
   Time          : 2009/02/08 00:22:56
   Port priority : 0.00e0-fc01-6510 0 0.00e0-fc01-6510 128.2
```

Table 29 Command output

Field	Description
Port	Port name.

Field	Description
Role change	Role change of the port ("Aged" means that the change was caused by expiration of the received configuration BPDU).
Time	Time of port role calculation.
Port priority	Port priority.

display stp region-configuration

Syntax

display stp region-configuration [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

1: Monitor level

Parameters

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display stp region-configuration** to display effective configuration information of the MST region, including the region name, revision level, and user-configured VLAN-to-instance mappings.

Related commands: **instance**, **region-name**, **revision-level**, and **vlan-mapping modulo**.

Examples

In MSTP mode, display effective MST region configuration information.
```
<Sysname> display stp region-configuration
 Oper Configuration
   Format selector      :0
   Region name          :hello
   Revision level       :0
   Configuration digest :0x5f762d9a46311effb7a488a3267fca9f


   Instance    Vlans Mapped
      0        21 to 4094
      1        1 to 10
      2        11 to 20
```

In PVST mode, display the effective MST region configuration information.
```
<Sysname> system-view
[Sysname] stp mode pvst
```

```
[Sysname] display stp region-configuration
 Oper Configuration
   Format selector      :0
   Region name          :hello
   Revision level       :0
   Configuration digest :0x5f762d9a46311effb7a488a3267fca9f

   Instance    Mode      Vlans Mapped
      0        default   3 to 4094
      1        static    1
      2        dynamic   2
```

Table 30 Command output

Field	Description
Format selector	Format selector defined by the spanning tree protocol. The default value is 0 and the selector cannot be configured.
Region name	MST region name.
Revision level	Revision level of the MST region, which can be configured by using the **revision-level** command and defaults to 0.
Mode	MSTI mode: • **Default**—The default instance MSTI 0. In PVST mode, the spanning tree feature is disabled. • **Static**—The static MSTI. • **Dynamic**—The dynamically assigned MSTI, which only exists in PVST mode.

display stp root

Syntax

display stp root [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

1: Monitor level

Parameters

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display stp root** to display the root bridge information of all MSTIs.

Examples

In MSTP mode, display the root bridge information of all spanning trees.

```
<Sysname> display stp root
 MSTID   Root Bridge ID        ExtPathCost IntPathCost Root Port
    0    0.00e0-fc0e-6554      200200      0           GigabitEthernet1/0/1
```

In PVST mode, display the root bridge information of all spanning trees.

```
<Sysname> system-view
[Sysname] stp mode pvst
[Sysname] display stp root
 VLAN    Root Bridge ID        ExtPathCost IntPathCost Root Port
    1    0.00e0-fc0e-6554      200200      0           GigabitEthernet1/0/1
```

Table 31 Command output

Field	Description
ExtPathCost	External path cost. The device automatically calculates the default path cost of a port. Or, you can use the **stp cost** command to configure the path cost of a port.
IntPathCost	Internal path cost. The device automatically calculates the default path cost of a port. Or, you can use the **stp cost** command to configure the path cost of a port.
Root Port	Root port name (displayed only if a port of the device is the root port of MSTIs).

display stp tc

Syntax

display stp [**instance** *instance-id* | **vlan** *vlan-id*] **tc** [**slot** *slot-number*] [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

0: Visit level

Parameters

instance *instance-id*: Displays the statistics of TC/TCN BPDUs received and sent by all ports in a particular MSTI. The value of *instance-id* ranges from 0 to 16, where 0 represents the CIST.

vlan *vlan-id*: Displays the statistics of TC/TCN BPDUs received and sent by all ports in the specified VLAN, in the range of 1 to 4094.

slot *slot-number*: Displays the statistics of TC/TCN BPDUs received and sent by all ports on the specified IRF member switch. *slot-number* represents the member number of the device in the IRF. If this keyword-argument combination is not specified, this command displays the statistics of TC/TCN BPDUs received and sent by all ports on all IRF member switches.

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display stp tc** to display the statistics of TC/TCN BPDUs received and sent by all ports in an MSTI or all MSTIs.

In STP/RSTP mode, the displayed information is sorted by port name.

In MSTP mode, follow these guidelines:

- If you do not specify any MSTI, this command displays the statistics of TC/TCN BPDUs received and sent by all ports in all MSTIs. The displayed information is sorted by instance ID and by port name in each MSTI.
- If you specify an MSTI, this command displays the statistics of TC/TCN BPDUs received and sent by all ports in the specified MSTI, in port name order.

In PVST mode, follow these guidelines:

- If you do not specify any VLAN, this command displays the statistics of TC/TCN BPDUs received and sent by all ports in all VLANs. The displayed information is sorted by VLAN ID and by port name in each VLAN.
- If you specify a VLAN, this command displays the statistics of TC/TCN BPDUs received and sent by all ports in the specified VLAN, in port name order.

Examples

In MSTP mode, display the statistics of TC/TCN BPDUs received and sent by all ports on IRF member switch 1 in MSTI 0.

```
<Sysname> display stp instance 0 tc slot 1
 -------------- STP slot 1 TC or TCN count -------------
 MSTID      Port                    Receive      Send
   0        GigabitEthernet1/0/1         6         4
   0        GigabitEthernet1/0/2         0         2
```

In PVST mode, display the statistics of TC/TCN BPDUs received and sent by all ports on IRF member switch 1 in VLAN 2.

```
<Sysname> system-view
[Sysname] stp mode pvst
[Sysname] display stp vlan 2 tc slot 1
 -------------- STP slot 1 TC or TCN count -------------
 VLAN      Port                    Receive      Send
    2      GigabitEthernet1/0/1         6         4
    2      GigabitEthernet1/0/2         0         2
```

Table 32 Command output

Field	Description
Port	Port name.
Receive	Number of TC/TCN BPDUs received on each port.
Send	Number of TC/TCN BPDUs sent by each port.

instance

Syntax

instance *instance-id* **vlan** *vlan-list*

undo instance *instance-id* [**vlan** *vlan-list*]

View

MST region view

Default level

2: System level

Parameters

instance-id: Specifies an MSTI ID. The minimum value is 0, representing the CIST.

- In MSTP mode, the *instance-id* argument ranges from 0 to 16.
- In PVST mode, the *instance-id* argument ranges from 0 to 32.

vlan *vlan-list*: Specifies a VLAN list in the format of *vlan-list* = { *vlan-id* [**to** *vlan-id*] }&<1-10>, where the *vlan-id* argument represents the VLAN ID, in the range of 1 to 4094, and &<1-10> indicates that you can specify up to 10 VLAN IDs or VLAN ID ranges.

Description

Use **instance** to map a list of VLANs to the specified MSTI.

Use **undo instance** to remap the specified VLAN or all VLANs to the CIST (MSTI 0).

By default, all VLANs are mapped to the CIST.

If you specify no VLAN in the **undo instance** command, all VLANs mapped to the specified MSTI will be remapped to the CIST.

You cannot map the same VLAN to different MSTIs. If you map a VLAN that has been mapped to an MSTI to a new MSTI, the old mapping will be automatically removed.

In PVST mode, you can map multiple VLANs to the CIST, and only one VLAN to each remaining MSTI.

After configuring this command, run the **active region-configuration** command to activate the VLAN-to-instance mapping.

Related commands: **display stp region-configuration**, **check region-configuration**, and **active region-configuration**.

Examples

Map VLAN 2 to MSTI 1.
```
<Sysname> system-view
[Sysname] stp region-configuration
[Sysname-mst-region] instance 1 vlan 2
```

region-name

Syntax

region-name *name*

undo region-name

View

MST region view

Default level

2: System level

Parameters

name: Specifies the MST region name, a string of 1 to 32 characters.

Description

Use **region-name** to configure the MST region name.

Use **undo region-name** to restore the default MST region name.

By default, the MST region name of a device is its MAC address.

The MST region name, the VLAN-to-instance mapping table, and the MSTP revision level of a device determine the device's MST region.

After configuring this command, run the **active region-configuration** command to activate the configured MST region name.

Related commands: **instance**, **revision-level**, **vlan-mapping modulo**, **display stp region-configuration**, **check region-configuration**, and **active region-configuration**.

Examples

Set the MST region name of the device to **hello**.

```
<Sysname> system-view
[Sysname] stp region-configuration
[Sysname-mst-region] region-name hello
```

reset stp

Syntax

reset stp [**interface** *interface-list*]

View

User view

Default level

1: Monitor level

Parameters

interface *interface-list*: Clears the MSTP statistics of the ports specified in the format of *interface-list* = { *interface-type interface-number* [**to** *interface-type interface-number*] }&<1-10>, where &<1-10> indicates that you can specify up to 10 ports or port ranges.

Description

Use **reset stp** to clear the MSTP statistics.

The MSTP statistics include the numbers of TCN BPDUs, configuration BPDUs, RST BPDUs and MST BPDUs sent/received through the specified ports. The STP BPDUs and TCN BPDUs are counted only for the CIST.

If you specify the *interface-list* argument, the **reset stp** command clears the spanning tree-related statistics on the specified ports. Without the argument, the **reset stp** command clears the spanning tree-related statistics on all ports.

Related commands: **display stp**.

Examples

Clear the spanning tree-related statistics on ports GigabitEthernet 1/0/1 through GigabitEthernet 1/0/3.

```
<Sysname> reset stp interface gigabitethernet 1/0/1 to gigabitethernet 1/0/3
```

revision-level

Syntax

revision-level *level*

undo revision-level

View

MST region view

Default level

2: System level

Parameters

level: Specifies an MSTP revision level, in the range of 0 to 65535.

Description

Use **revision-level** to configure the MSTP revision level.

Use **undo revision-level** to restore the default MSTP revision level.

By default, the MSTP revision level is 0.

The MSTP revision level, the MST region name, and the VLAN-to-instance mapping table of a device determine the device's MST region. When the MST region name and VLAN-to-instance mapping table are both the same for two MST regions, they can still be differentiated by their MSTP revision levels.

After configuring this command, run the **active region-configuration** command to activate the configured MST region level.

Related commands: **instance**, **region-name**, **vlan-mapping modulo**, **display stp region-configuration**, **check region-configuration**, and **active region-configuration**.

Examples

Set the MSTP revision level of the MST region to 5.

```
<Sysname> system-view
[Sysname] stp region-configuration
[Sysname-mst-region] revision-level 5
```

stp bpdu-protection

Syntax

stp bpdu-protection

undo stp bpdu-protection

View

System view

Default level

2: System level

Parameters

None

Description

Use **stp bpdu-protection** to enable the BPDU guard function.

Use **undo stp bpdu-protection** to disable the BPDU guard function.

By default, the BPDU guard function is disabled.

Examples

Enable the BPDU guard function.

```
<Sysname> system-view
[Sysname] stp bpdu-protection
```

stp bridge-diameter

Syntax

stp [**vlan** *vlan-list*] **bridge-diameter** *diameter*

undo stp [**vlan** *vlan-list*] **bridge-diameter**

View

System view

Default level

2: System level

Parameters

vlan *vlan-list*: Specifies a VLAN list in the format of *vlan-list* = { *vlan-id* [**to** *vlan-id*] }&<1-10>, where the *vlan-id* argument represents the VLAN ID, in the range of 1 to 4094, and &<1-10> indicates that you can specify up to 10 VLAN IDs or VLAN ID ranges.

diameter: Specifies the switched network diameter, in the range of 2 to 7.

Description

Use **stp bridge-diameter** to specify the network diameter, the maximum possible number of stations between any two terminal devices on the switched network.

Use **undo stp bridge-diameter** to restore the default.

By default, the network diameter of the switched network is 7.

An appropriate setting of hello time, forward delay, and max age can speed up network convergence. The values of these timers are related to the network size and you can set the timers by setting the network diameter. With the network diameter set to 7 (the default), the three timers will also be set to their defaults.

To set the network diameter of an STP/RSTP/MSTP switched network, use this command without specifying any VLAN. To set the network diameter of a specified VLAN or multiple VLANs in a PVST switched network, use this command with a VLAN list specified.

In STP, RSTP, or MSTP mode, each MST region is considered as a device, and the configured network diameter of the switched network takes effect only on the CIST (or the common root bridge) but not on the MSTIs.

In PVST mode, the network diameter configuration takes effect only on the root bridge.

Related commands: **stp timer forward-delay**, **stp timer hello**, and **stp timer max-age**.

Examples

In MSTP mode, set the network diameter of the switched network to 5.

```
<Sysname> system-view
[Sysname] stp bridge-diameter 5
```

In PVST mode, set the network diameter of VLAN 2 to 5.

```
<Sysname> system-view
[Sysname] stp mode pvst
[Sysname] stp vlan 2 bridge-diameter 5
```

stp compliance

Syntax

stp compliance { **auto** | **dot1s** | **legacy** }

undo stp compliance

View

Ethernet interface view, port group view, Layer 2 aggregate interface view

Default level

2: System level

Parameters

auto: Configures the ports to recognize the MSTP BPDU format automatically and determine the format of MSTP BPDUs to send.

dot1s: Configures the ports to receive and send only standard-format (802.1s-compliant) MSTP BPDUs.

legacy: Configures the ports to receive and send only compatible-format MSTP BPDUs.

Description

Use **stp compliance** to configure the mode the specified ports will use to recognize and send MSTP BPDUs.

Use **undo stp compliance** to restore the default.

By default, a port automatically recognizes the formats of received MSTP packets and determines the formats of MSTP packets to be sent based on the recognized formats.

Configured in Ethernet interface view, the setting takes effect on that interface only.

Configured in port group view, the setting takes effect on all ports in the port group.

Configured in Layer 2 aggregate interface view, the setting takes effect only on the aggregate interface.

Configured on a member port in an aggregation group, the setting takes effect only after the port leaves the aggregation group.

Examples

Configure GigabitEthernet 1/0/1 to receive and send only standard-format (802.1s) MSTP packets.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] stp compliance dot1s
```

stp config-digest-snooping

Syntax

stp config-digest-snooping

undo stp config-digest-snooping

View

System view, Ethernet interface view, port group view, Layer 2 aggregate interface view

Default level

2: System level

Parameters

None

Description

Use **stp config-digest-snooping** to enable Digest Snooping.

Use **undo stp config-digest-snooping** to disable Digest Snooping.

The feature is disabled by default.

Configured in system view, the setting takes effect globally.

Configured in Ethernet interface view, the setting takes effect on the interface only.

Configured in port group view, the setting takes effect on all ports in the port group.

Configured in Layer 2 aggregate interface view, the setting takes effect only on the aggregate interface.

Configured on a member port in an aggregation group, the setting takes effect only after the port leaves the aggregation group.

Enable this feature both globally and on ports connected to other vendors' devices to make it effective. To minimize impact, enable the feature on all associated ports before you enable it globally.

Related commands: **display stp**.

Examples

Enable Digest Snooping on GigabitEthernet 1/0/1 and then globally.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] stp config-digest-snooping
[Sysname-GigabitEthernet1/0/1] quit
[Sysname] stp config-digest-snooping
```

stp cost

stp [**instance** *instance-id* | **vlan** *vlan-list*] **cost** *cost*

undo stp [**instance** *instance-id* | **vlan** *vlan-list*] **cost**

View

Ethernet interface view, port group view, Layer 2 aggregate interface view

Default level

2: System level

Parameters

instance *instance-id*: Sets the path cost of the ports in a particular MSTI. The value of *instance-id* ranges from 0 to 16, where 0 represents the CIST.

vlan *vlan-list*: Specifies a VLAN list in the format of *vlan-list* = { *vlan-id* [**to** *vlan-id*] }&<1-10>, where the *vlan-id* argument represents the VLAN ID, in the range of 1 to 4094, and &<1-10> indicates that you can specify up to 10 VLAN IDs or VLAN ID ranges.

cost: Specifies the path cost of the port, with an effective range that depends on the path cost calculation standard adopted.

- With the IEEE 802.1d-1998 standard selected for path cost calculation, the *cost* argument ranges from 1 to 65535.
- With the IEEE 802.1t standard selected for path cost calculation, the *cost* argument ranges from 1 to 200000000.
- With the private standard selected for path cost calculation, the *cost* argument ranges from 1 to 200000.

Description

Use **stp cost** to set the path cost of the port or ports.

Use **undo stp cost** to restore the default.

By default, the device automatically calculates the path costs of ports in each spanning tree based on the corresponding standard.

Configured in Ethernet interface view, the setting takes effect only on the interface.

Configured in port group view, the setting takes effect on all ports in the port group.

Configured in Layer 2 aggregate interface view, the setting takes effect only on the aggregate interface. Configured on a member port in an aggregation group, the setting takes effect only after the port leaves the aggregation group.

To set the path cost of an MSTP port in a specific MSTI, use this command with the MSTI specified. To set the path cost of a PVST port in a specific VLAN, use this command with the VLAN specified. To set the path cost of an MSTP port in the CIST or an STP/RSTP port, use this command without specifying any MSTI and VLAN.

Path cost is an important factor in spanning tree calculation. Setting different path costs for a port in MSTIs allows VLAN traffic flows to be forwarded along different physical links, which results in VLAN-based load balancing.

The path cost setting of a port can affect the role selection of the port. When the path cost of a port is changed, the system will re-calculate the role of the port and initiate a state transition.

Related commands: **display stp** and **stp pathcost-standard**.

In MSTP mode, set the path cost of port GigabitEthernet 1/0/3 in MSTI 2 to 200.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/3
[Sysname-GigabitEthernet1/0/3] stp instance 2 cost 200
```

In PVST mode, set the path cost of port GigabitEthernet 1/0/3 in VLAN 2 to 200.

```
<Sysname> system-view
[Sysname] stp mode pvst
[Sysname] interface gigabitethernet 1/0/3
[Sysname-GigabitEthernet1/0/3] stp vlan 2 cost 200
```

stp edged-port

Syntax

stp edged-port { **enable** | **disable** }

undo stp edged-port

View

Ethernet interface view, port group view, Layer 2 aggregate interface view

Default level

2: System level

Parameters

enable: Configures the ports as edge ports.

disable: Configures the ports as non-edge ports.

Description

Use **stp edged-port enable** to configure the ports as edge ports.

Use **stp edged-port disable** to configure the ports as non-edge ports.

Use **undo stp edged-port** to restore the default.

By default, all ports are non-edge ports.

Configured in Ethernet interface view, the setting takes effect only on the interface.

Configured in port group view, the setting takes effect on all ports in the port group.

Configured in Layer 2 aggregate interface view, the setting takes effect only on the aggregate interface.

Configured on a member port in an aggregation group, the setting takes effect only after the port leaves the aggregation group.

If a port directly connects to a user terminal rather than another device or a shared LAN segment, this port is regarded as an edge port. When the network topology changes, an edge port will not cause a temporary loop. You can enable the port to transit to the forwarding state rapidly by configuring it as an edge port. HP recommends you to configure ports directly connecting to user terminals as edge ports.

Typically, configuration BPDUs from other devices cannot reach an edge port, because the edge port does not connect to any other device. Therefore, if a port receives a configuration BPDU when the BPDU

guard function is disabled, the port functions as a non-edge port, even if you configure it as an edge port.

You cannot configure edge port settings and loop guard on a port at the same time.

Related commands: **stp loop-protection**.

Examples

Configure GigabitEthernet 1/0/1 as an edge port.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] stp edged-port enable
```

stp enable

Syntax

In system view:

stp [**vlan** *vlan-list*] **enable**

undo stp [**vlan** *vlan-list*] **enable**

In Ethernet interface, Layer 2 aggregate interface, or port group view:

stp enable

undo stp enable

View

System view, Ethernet interface view, port group view, Layer 2 aggregate interface view

Default level

2: System level

Parameters

vlan *vlan-list*: Enables or disables the spanning tree feature for a VLAN list, which is specified in the format of *vlan-list* = { *vlan-id* [**to** *vlan-id*] }&<1-10>, where the *vlan-id* argument represents the VLAN ID, in the range of 1 to 4094, and &<1-10> indicates that you can specify up to 10 VLAN IDs or VLAN ID ranges. If you do not specify the **vlan** *vlan-list* option, the command enables or disables the spanning tree feature globally rather than for any VLAN.

Description

Use **stp enable** to enable the spanning tree feature globally.

Use **undo stp enable** to disable the spanning tree feature.

By default, the spanning tree feature is disabled globally, enabled on all VLANs, and enabled on all ports.

Configured in system view, the setting takes effect globally.

Configured in Ethernet interface view, the setting takes effect only on the interface.

Configured in port group view, the setting takes effect on all ports in the port group.

Configured in Layer 2 aggregate interface view, the setting takes effect only on the aggregate interface.

Configured on a member port in an aggregation group, the setting takes effect only after the port leaves the aggregation group.

When you enable the spanning tree feature, the device operates in STP, RSTP, MSTP, or PVST mode, depending on the spanning tree mode setting.

When you enable MSTP, the switch dynamically maintains the spanning tree status of VLANs, based on received configuration BPDUs.

When you disable MSTP, the switch stops maintaining the spanning tree status.

Related commands: **stp mode**.

Examples

In MSTP mode, enable the spanning tree feature globally.

```
<Sysname> system-view
[Sysname] stp enable
```

In PVST mode, enable the spanning tree feature globally and in VLAN 2.

```
<Sysname> system-view
[Sysname] stp mode pvst
[Sysname] stp enable
[Sysname] stp vlan 2 enable
```

In MSTP mode, disable the spanning tree feature on port GigabitEthernet 1/0/1.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] undo stp enable
```

stp loop-protection

Syntax

stp loop-protection

undo stp loop-protection

View

Ethernet interface view, port group view, Layer 2 aggregate interface view

Default level

2: System level

Parameters

None

Description

Use **stp loop-protection** to enable the loop guard function on the ports.

Use **undo stp loop-protection** to restore the default.

By default, the loop guard function is disabled.

Configured in Ethernet interface view, the setting takes effect only on the interface.

Configured in port group view, the setting takes effect on all ports in the port group.

Configured in Layer 2 aggregate interface view, the setting takes effect only on the aggregate interface.

Configured on a member port in an aggregation group, the setting takes effect only after the port leaves the aggregation group.

You cannot configure edge port settings and loop guard, or configure root guard and loop guard on a port at the same time.

Related commands: **stp edged-port** and **stp root-protection**.

Examples

Enable the loop guard function on GigabitEthernet 1/0/1.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] stp loop-protection
```

stp max-hops

Syntax

stp max-hops *hops*

undo stp max-hops

View

System view

Default level

2: System level

Parameters

hops: Sets the maximum hops, in the range of 1 to 40.

Description

Use **stp max-hops** to set the maximum hops of the MST region.

Use **undo stp max-hops** to restore the default.

By default, the maximum number of hops of an MST region is 20.

Related commands: **display stp**.

Examples

Set the maximum hops of the MST region to 35.

```
<Sysname> system-view
[Sysname] stp max-hops 35
```

stp mcheck

Syntax

stp mcheck

View

System view, Ethernet interface view, Layer 2 aggregate interface view

Default level

2: System level

Parameters

None

Description

Use **stp mcheck** to perform the mCheck operation globally or on a port.

If a port on a device running MSTP, RSTP, or PVST mode connects to an STP device, the port will automatically migrate to the STP mode. It will not be able to migrate automatically back to the MSTP, RSTP, or PVST mode, so it will remain operating in the STP mode until the STP switch is shut down or removed, or migrated to the MSTP, RSTP, or PVST mode. Then, you can perform an mCheck operation to force the port to migrate to the MSTP, RSTP, or PVST mode.

Suppose Device A running STP, Device B with no spanning tree feature enabled, and Device C running MSTP, RSTP, or PVST are connected in order. Device B will transparently transmit the STP BPDUs, and the port on Device C and connecting to Device B will transit to the STP mode. After you enable the spanning tree feature on Device B, to run MSTP, RSTP, or PVST between Device B and Device C, you must perform an mCheck operation on the ports interconnecting Device B and Device C, in addition to configuring the spanning tree to operate in MSTP, RSTP, or PVST mode on Device B.

The device operates in STP, RSTP, MSTP, or PVST mode depending on the spanning tree mode setting.

The **stp mcheck** command is effective only when the device operates in MSTP, RSTP, or PVST mode.

Configured in system view, the setting takes effect globally.

Configured in Ethernet interface view, the setting takes only effect on the interface.

Configured in Layer 2 aggregate interface view, the setting takes effect only on the aggregate interface.

Configured on a member port in an aggregation group, the setting takes effect only after the port leaves the aggregation group.

Related commands: **stp mode**.

Examples

Perform mCheck on GigabitEthernet 1/0/1.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] stp mcheck
```

stp mode

Syntax

stp mode { **stp** | **rstp** | **mstp** | **pvst** }

undo stp mode

View

System view

Default level

2: System level

Parameters

stp: Configures the spanning tree device to operate in STP mode.

rstp: Configures the spanning tree device to operate in RSTP mode.

mstp: Configures the spanning tree device to operate in MSTP mode.

pvst: Configures the spanning tree device to operate in PVST mode.

Description

Use **stp mode** to configure the spanning tree operating mode.

Use **undo stp mode** to restore the default.

By default, a spanning tree device operates in MSTP mode.

Related commands: **stp mcheck** and **stp enable**.

Examples

Configure the spanning tree device to operate in STP mode.
```
<Sysname> system-view
[Sysname] stp mode stp
```

stp no-agreement-check

Syntax

stp no-agreement-check

undo stp no-agreement-check

View

Ethernet interface view, port group view, Layer 2 aggregate interface view

Default level

2: System level

Parameters

None

Description

Use **stp no-agreement-check** to enable No Agreement Check on the ports.

Use **undo stp no-agreement-check** to disable No Agreement Check on the ports.

By default, No Agreement Check is disabled.

Configured in Ethernet interface view, the setting takes effect only on the interface.

Configured in port group view, the setting takes effect on all member ports in the port group.

Configured in Layer 2 aggregate interface view, the setting takes effect only on the aggregate interface.

Configured on a member port in an aggregation group, the setting takes effect only after the port leaves the aggregation group.

This feature takes effect only after you enable it on the root port.

Examples

Enable No Agreement Check on GigabitEthernet 1/0/1.
```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] stp no-agreement-check
```

stp pathcost-standard

Syntax

stp pathcost-standard { **dot1d-1998** | **dot1t** | **legacy** }

undo stp pathcost-standard

View

System view

Default level

2: System level

Parameters

dot1d-1998: Configures the device to calculate the default path cost for ports based on IEEE 802.1d-1998.

dot1t: Configures the device to calculate the default path cost for ports based on IEEE 802.1t.

legacy: Configures the device to calculate the default path cost for ports based on a private standard.

Description

Use **stp pathcost-standard** to specify a standard for the device to use when calculating the default path costs for ports.

Use **undo stp pathcost-standard** to restore the default.

By default, the switch calculates the default path cost for ports based on a private standard.

If you change the standard that the device uses in calculating the default path costs, you restore the path costs to the default.

Related commands: **stp cost** and **display stp**.

Examples

Configure the device to calculate the default path cost for ports based on IEEE 802.1d-1998.

```
<Sysname> system-view
[Sysname] stp pathcost-standard dot1d-1998
```

stp point-to-point

Syntax

stp point-to-point { **auto** | **force-false** | **force-true** }

undo stp point-to-point

View

Ethernet interface view, port group view, Layer 2 aggregate interface view

Default level

2: System level

Parameters

auto: Specifies automatic detection of the link type.

force-false: Specifies the non-point-to-point link type.

force-true: Specifies the point-to-point link type.

Description

Use **stp point-to-point** to configure the link type of the ports.

Use **undo stp point-to-point** to restore the default.

The default setting is **auto** and the spanning tree device automatically detects whether a port connects to a point-to-point link.

Configured in Ethernet interface view, the setting takes effect only on the interface.

Configured in port group view, the setting takes effect on all member ports in the port group.

Configured in Layer 2 aggregate interface view, the setting takes effect only on the aggregate interface.

Configured on a member port in an aggregation group, the setting takes effect only after the port leaves the aggregation group.

When connecting to a non-point-to-point link, a port is incapable of rapid state transition.

You can configure the link type as point-to-point for a Layer 2 aggregate interface or a port that operates in full duplex mode. HP recommends that you use the default setting, which lets the device automatically detect the port link type.

The **stp point-to-point force-false** or **stp point-to-point force-true** command configured on a port in MSTP or PVST mode takes effect on all MSTIs or VLANs.

If the physical link to which the port connects is not a point-to-point link but you set it to be one, the configuration may bring a temporary loop.

Related commands: **display stp**.

Examples

Configure the link connecting GigabitEthernet 1/0/3 as a point-to-point link.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/3
[Sysname-GigabitEthernet1/0/3] stp point-to-point force-true
```

stp port priority

Syntax

stp [**instance** *instance-id* | **vlan** *vlan-list*] **port priority** *priority*

undo stp [**instance** *instance-id* | **vlan** *vlan-list*] **port priority**

View

Ethernet interface view, port group view, Layer 2 aggregate interface view

Default level

2: System level

Parameters

instance *instance-id*: Sets the priority of the ports in a particular MSTI. The value of *instance-id* ranges from 0 to 16, where 0 represents the CIST.

priority: Specifies a port priority, in the range of 0 to 240 in steps of 16 (as in 0, 16, 32).

vlan *vlan-list*: Specifies a VLAN list in the format of *vlan-list* = { *vlan-id* [**to** *vlan-id*] }&<1-10>, where the *vlan-id* argument represents the VLAN ID, in the range of 1 to 4094, and &<1-10> indicates that you can specify up to 10 VLAN IDs or VLAN ID ranges.

Description

Use **stp port priority** to set the priority of the ports.

Use **undo stp port priority** to restore the default.

By default, the port priority is 128.

Configured in Ethernet interface view, the setting takes effect only on the interface.

Configured in port group view, the setting takes effect on all ports in the port group.

Configured in Layer 2 aggregate interface view, the setting takes effect only on the aggregate interface.

Configured on a member port in an aggregation group, the setting takes effect only after the port leaves the aggregation group.

To set the priority of an MSTP port in a specific MSTI, use this command with the MSTI specified. To set the priority of a PVST port in a specific VLAN or multiple VLANs, use this command with a VLAN list specified. To set the priority of an MSTP port in the CIST or an STP/RSTP port, use this command without specifying any MSTI and VLAN.

Port priority affects the role of a port in a spanning tree.

The smaller the value, the higher the port priority. If all ports on your device use the same priority value, the port priority depends on the port index. The smaller the index, the higher the priority.

Related commands: **display stp**.

Examples

In MSTP mode, set the priority of port GigabitEthernet 1/0/3 to 16 in MSTI 2.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/3
[Sysname-GigabitEthernet1/0/3] stp instance 2 port priority 16
```

In PVST mode, set the priority of port GigabitEthernet 1/0/3 to 16 in VLAN 2.

```
<Sysname> system-view
[Sysname] stp mode pvst
[Sysname] interface gigabitethernet 1/0/3
[Sysname-GigabitEthernet1/0/3] stp vlan 2 port priority 16
```

stp port-log

Syntax

stp port-log { **instance** { *instance-id* | **all** } | **vlan** *vlan-list* }

undo stp port-log { **instance** { *instance-id* | **all** } | **vlan** *vlan-list* }

View

System view

Default level

2: System level

Parameters

instance *instance-id*: Specifies an MSTI. The value of *instance-id* ranges from 0 to 16, where 0 represents the CIST. To enable or disable outputting port state transition information in STP/RSTP mode, specify **instance 0**.

all: Specifies all MSTIs.

vlan *vlan-list*: Specifies a VLAN list in the format of *vlan-list* = { *vlan-id* [**to** *vlan-id*] }&<1-10>, where the *vlan-id* argument represents the VLAN ID, in the range of 1 to 4094, and &<1-10> indicates that you can specify up to 10 VLAN IDs or VLAN ID ranges.

Description

Use **stp port-log** to enable outputting port state transition information for the specified MSTI or all MSTIs.

Use **undo stp port-log** to disable outputting port state transition information for the specified MSTI or all MSTIs.

By default, this function is enabled.

Examples

In MSTP mode, enable outputting port state transition information for MSTI 2.

```
<Sysname> system-view
[Sysname] stp port-log instance 2
%Aug 16 00:49:41:856 2006 Sysname MSTP/3/MSTP_DISCARDING: Instance 2's
GigabitEthernet1/0/1 has been set to discarding state!
%Aug 16 00:49:41:856 2006 Sysname MSTP/3/MSTP_DISCARDING: Instance 2's
GigabitEthernet1/0/2 has been set to forwarding state!
```

The output shows that GigabitEthernet 1/0/1 in MSTI 2 transited to the discarding state and GigabitEthernet 1/0/2 in MSTI 2 transited to the forwarding state.

In PVST mode, enable outputting port state transition information for VLAN 1 to VLAN 4094.

```
<Sysname> system-view
[Sysname] stp mode pvst
[Sysname] stp port-log vlan 1 to 4094
%Aug 16 00:49:41:856 2006 Sysname MSTP/3/PVST_DISCARDING: VLAN 2's GigabitEthernet1/0/1
has been set to discarding state!
%Aug 16 00:49:41:856 2006 Sysname MSTP/3/PVST_FORWARDING: VLAN 2's GigabitEthernet1/0/2
has been set to forwarding state!
```

The output shows that GigabitEthernet 1/0/1 in VLAN 2 transited to the discarding state and GigabitEthernet 1/0/2 in VLAN 2 transited to the forwarding state.

stp priority

Syntax

stp [**instance** *instance-id* | **vlan** *vlan-list*] **priority** *priority*

undo stp [**instance** *instance-id* | **vlan** *vlan-list*] **priority**

View

System view

Default level

2: System level

Parameters

instance *instance-id*: Sets the priority of the device in an MSTI. The value of *instance-id* ranges from 0 to 16, where 0 represents the CIST.

vlan *vlan-list*: Specifies a VLAN list in the format of *vlan-list* = { *vlan-id* [**to** *vlan-id*] }&<1-10>, where the *vlan-id* argument represents the VLAN ID, ranges from 1 to 4094, and &<1-10> indicates that you can specify up to 10 VLAN IDs or VLAN ID ranges.

priority: Specifies a device priority, in the range of 0 to 61440 in increments of 4096 (as in 0, 4096, 8192). You can set up to 16 priority values on the device. The smaller the value, the higher the device priority.

Description

Use **stp priority** to set the priority of the device.

Use **undo stp priority** to restore the default priority.

By default, the device priority is 32768.

To set the priority of an MSTP device in a specific MSTI, use this command with the MSTI specified. To set the priority of a PVST device in a specific VLAN or multiple VLANs, use this command with a VLAN list specified. To set the priority of an MSTP device in the CIST or an STP/RSTP device, use this command without specifying any MSTI and VLAN.

Examples

In MSTP mode, set the device priority to 4096 in MSTI 1.

```
<Sysname> system-view
[Sysname] stp instance 1 priority 4096
```

In PVST mode, set the device priority to 4096 in VLAN 1.

```
<Sysname> system-view
[Sysname] stp mode pvst
[Sysname] stp vlan 1 priority 4096
```

stp region-configuration

Syntax

stp region-configuration

undo stp region-configuration

View

System view

Default level

2: System level

Parameters

None

Description

Use **stp region-configuration** to enter MST region view.

Use **undo stp region-configuration** to restore the default MST region configurations.

These are the default settings for the MST region:

- The MST region name of the device is the MAC address of the device.
- All VLANs are mapped to the CIST.
- The MSTP revision level is 0.

After you enter MST region view, you can configure the MST region-related parameters, including the region name, VLAN-to-instance mappings, and revision level.

Examples

Enter MST region view.

```
<Sysname> system-view
[Sysname] stp region-configuration
[Sysname-mst-region]
```

stp root primary

Syntax

stp [**instance** *instance-id* | **vlan** *vlan-list*] **root primary**

undo stp [**instance** *instance-id* | **vlan** *vlan-list*] **root**

View

System view

Default level

2: System level

Parameters

instance *instance-id*: Configures the device as the root bridge in a particular MSTI. The value of *instance-id* ranges from 0 to 16, where 0 represents the CIST.

vlan *vlan-list*: Specifies a VLAN list in the format of *vlan-list* = { *vlan-id* [**to** *vlan-id*] }&<1-10>, where the *vlan-id* argument represents the VLAN ID, in the range of 1 to 4094, and &<1-10> indicates that you can specify up to 10 VLAN IDs or VLAN ID ranges.

Description

Use **stp root primary** to configure the device as the root bridge.

Use **undo stp root** to restore the default.

By default, a device is not a root bridge.

To set an MSTP device as the root bridge in a specific MSTI, use this command with the MSTI specified. To set a PVST device as the root bridge in a specific VLAN or multiple VLANs, use this command with a VLAN list specified. To set an MSTP device in the CIST or an STP/RSTP device as the root bridge, use this command without specifying any MSTI and VLAN.

Once you specify the device as the root bridge, you cannot change the priority of the device.

Related commands: **stp priority** and **stp root secondary**.

Examples

In MSTP mode, specify the device as the root bridge of MSTI 1.

```
<Sysname> system-view
[Sysname] stp instance 1 root primary
```

In PVST mode, specify the device as the root bridge of VLAN 1.

```
<Sysname> system-view
[Sysname] stp mode pvst
[Sysname] stp vlan 1 root primary
```

stp root secondary

Syntax

stp [**instance** *instance-id* | **vlan** *vlan-list*] **root secondary**

undo stp [**instance** *instance-id* | **vlan** *vlan-list*] **root**

View

System view

Default level

2: System level

Parameters

instance *instance-id*: Configures the device as a secondary root bridge in a particular MSTI. The value of *instance-id* ranges from 0 to 16, where 0 represents the CIST.

vlan *vlan-list*: Specifies a VLAN list in the format of *vlan-list* = { *vlan-id* [**to** *vlan-id*] }&<1-10>, where the *vlan-id* argument represents the VLAN ID, in the range of 1 to 4094, and &<1-10> indicates that you can specify up to 10 VLAN IDs or VLAN ID ranges.

Description

Use **stp root secondary** to configure the device as a secondary root bridge.

Use **undo stp root** to restore the default.

By default, a device is not a secondary root bridge.

To set an MSTP device as a secondary root bridge in a specific MSTI, use this command with the MSTI specified. To set a PVST device as a secondary root bridge in a specific VLAN or multiple VLANs, use this command with a VLAN list specified. To set an MSTP device in the CIST or an STP/RSTP device as a secondary root bridge, use this command without specifying any MSTI and VLAN.

Once you specify the device as a secondary root bridge, you cannot change the priority of the device.

Related commands: **stp priority** and **stp root primary**.

Examples

In MSTP mode, specify the device as a secondary root bridge in MSTI 1.

```
<Sysname> system-view
[Sysname] stp instance 1 root secondary
```

In PVST mode, specify the device as a secondary root bridge in VLAN 1.

```
<Sysname> system-view
[Sysname] stp mode pvst
[Sysname] stp vlan 1 root secondary
```

stp root-protection

Syntax

stp root-protection

undo stp root-protection

View

Ethernet interface view, port group view, Layer 2 aggregate interface view

Default level

2: System level

Parameters

None

Description

Use **stp root-protection** to enable the root guard function on the ports.

Use **undo stp root-protection** to restore the default.

By default, the root guard function is disabled.

Configured in Ethernet interface view, the setting takes effect only on the interface.

Configured in port group view, the setting takes effect on all ports in the port group.

Configured in Layer 2 aggregate interface view, the setting takes effect only on the aggregate interface.

Configured on a member port in an aggregation group, the setting takes effect only after the port leaves the aggregation group.

You cannot configure root guard and loop guard on a port at the same time.

Related commands: **stp loop-protection**.

Examples

Enable the root guard function for GigabitEthernet 1/0/1.
```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] stp root-protection
```

stp tc-protection

Syntax

stp tc-protection enable

stp tc-protection disable

View

System view

Default level

2: System level

Parameters

None

Description

Use **stp tc-protection enable** to enable the TC-BPDU attack guard function for the device.

Use **stp tc-protection disable** to disable the TC-BPDU attack guard function for the device.

By default, the TC-BPDU attack guard function is enabled.

Examples

Disable the TC-BPDU attack guard function for the device.

```
<Sysname> system-view
[Sysname] stp tc-protection disable
```

stp tc-protection threshold

Syntax

stp tc-protection threshold *number*

undo stp tc-protection threshold

View

System view

Default level

2: System level

Parameters

number: Sets the maximum number of immediate forwarding address entry flushes that the device can perform within a certain period of time (10 seconds). The value ranges from 1 to 255.

Description

Use **stp tc-protection threshold** to configure the maximum number of forwarding address entry flushes that the device can perform every a certain period of time (10 seconds).

Use **undo stp tc-protection threshold** to restore the default.

By default, the device can perform a maximum of six forwarding address entry flushes every 10 seconds.

Examples

Configure the device to perform up to 10 forwarding address entry flushes every 10 seconds.

```
<Sysname> system-view
[Sysname] stp tc-protection threshold 10
```

stp tc-snooping

Syntax

stp tc-snooping

undo stp tc-snooping

View

System view

Default level

2: System level

Parameters

None

Description

Use **stp tc-snooping** to enable topology change (TC) snooping.

Use **undo stp tc-snooping** to disable TC snooping.

By default, TC snooping disabled.

TC snooping and STP are mutually exclusive. Before enabling TC snooping, first disable STP globally.

TC snooping does not take effect on the ports on which BPDU tunneling is enabled for STP. For more information about BPDU tunneling, see *Layer 2—LAN Switching Configuration Guide*.

Related commands: **stp enable**.

Examples

\# Enable TC snooping globally.
```
<Sysname> system-view
[Sysname] undo stp enable
[Sysname] stp tc-snooping
```

stp timer forward-delay

Syntax

stp [**vlan** *vlan-list*] **timer forward-delay** *time*

undo stp [**vlan** *vlan-list*] **timer forward-delay**

View

System view

Default level

2: System level

Parameters

vlan *vlan-list*: Specifies a VLAN list in the format of *vlan-list* = { *vlan-id* [**to** *vlan-id*] }&<1-10>, where the *vlan-id* argument represents the VLAN ID, in the range of 1 to 4094, and &<1-10> indicates that you can specify up to 10 VLAN IDs or VLAN ID ranges.

time: Sets the forward delay in 0.01 seconds, in the range of 400 to 3000 in increments of 100 (as in 400, 500, 600).

Description

Use **stp timer forward-delay** to set the forward delay timer of the device.

Use **undo stp timer forward-delay** to restore the default.

By default, the forward delay timer is 15 seconds.

The forward delay timer determines the time interval of state transition. To prevent temporary loops, a spanning tree port goes through the learning (intermediate) state before it transits from the discarding to the forwarding state. To stay synchronized with the remote device, the port has a wait period between transition states that is determined by the forward delay timer.

To set the forward delay in STP/RSTP/MSTP mode, use this command without any VLAN specified. To set the forward delay for a specific VLAN or multiple VLANs in PVST mode, use this command with a VLAN list specified.

HP does not recommend that you set the forward delay with this command. Instead, you can specify the network diameter of the switched network by using the **stp bridge-diameter** command and let spanning tree protocols automatically calculate optimal settings of the forward delay timer. If the network diameter uses the default value, the forward delay timer also uses the default value.

Related commands: **stp timer hello**, **stp timer max-age**, and **stp bridge-diameter**.

Examples

In MSTP mode, set the forward delay timer to 20 seconds.

```
<Sysname> system-view
[Sysname] stp timer forward-delay 2000
```

In PVST mode, set the forward delay timer to 20 seconds.

```
<Sysname> system-view
[Sysname] stp mode pvst
[Sysname] stp vlan 2 timer forward-delay 2000
```

stp timer hello

Syntax

stp [**vlan** *vlan-list*] **timer hello** *time*

undo stp [**vlan** *vlan-list*] **timer hello**

View

System view

Default level

2: System level

Parameters

vlan *vlan-list*: Specifies a VLAN list in the format of *vlan-list* = { *vlan-id* [**to** *vlan-id*] }&<1-10>, where the *vlan-id* argument represents the VLAN ID, in the range of 1 to 4094, and &<1-10> indicates that you can specify up to 10 VLAN IDs or VLAN ID ranges.

time: Sets the hello time in 0.01 seconds, in the range of 100 to 1000 in increments of 100 (as in 100, 200, 300).

Description

Use **stp timer hello** to set the hello time of the device.

Use **undo stp timer hello** to restore the default.

By default, the hello time is 2 seconds.

Hello time is the time interval at which spanning tree devices send configuration BPDUs to maintain spanning tree. If a device fails to receive configuration BPDUs within the set period of time, a new spanning tree calculation process will be triggered due to timeout.

To set the hello time in STP/RSTP/MSTP mode, use this command without any VLAN specified. To set the hello time for a specific VLAN or multiple VLANs in PVST mode, use this command with a VLAN list specified.

HP does not recommend that you set the hello time with this command. Instead, you can specify the network diameter of the switched network by using the **stp bridge-diameter** command and let spanning

tree protocols automatically calculate optimal settings of the hello timer. If the network diameter uses the default value, the hello timer also uses the default value.

Related commands: **stp timer forward-delay**, **stp timer max-age**, and **stp bridge-diameter**.

Examples

In MSTP mode, set the hello time to 4 seconds.
```
<Sysname> system-view
[Sysname] stp timer hello 400
```
In PVST mode, set the hello time in VLAN 2 to 4 seconds.
```
<Sysname> system-view
[Sysname] stp mode pvst
[Sysname] stp vlan 2 timer hello 400
```

stp timer max-age

Syntax

stp [**vlan** *vlan-list*] **timer max-age** *time*

undo stp [**vlan** *vlan-list*] **timer max-age**

View

System view

Default level

2: System level

Parameters

vlan *vlan-list*: Specifies a VLAN list in the format of *vlan-list* = { *vlan-id* [**to** *vlan-id*] }&<1-10>, where the *vlan-id* argument represents the VLAN ID, in the range of 1 to 4094, and &<1-10> indicates that you can specify up to 10 VLAN IDs or VLAN ID ranges.

time: Sets the max age in 0.01 seconds, in the range of 600 to 4000 in increments of 100 (as in 600, 700, 800).

Description

Use **stp timer max-age** to set the max age timer of the device.

Use **undo stp timer max-age** to restore the default.

By default, the max age is 20 seconds.

In the CIST of an MSTP network or each VLAN of a PVST network, the device determines whether a configuration BPDU received on a port has expired based on the max age timer. If yes, a new spanning tree calculation process starts. The max age timer does not take effect on MSTIs.

To set the max age timer in STP/RSTP/MSTP mode, use this command without any VLAN specified. To set the max age timer for a specific VLAN or multiple VLANs in PVST mode, use this command with a VLAN list specified.

HP does not recommend that you set the max age timer with this command. Instead, you can specify the network diameter of the switched network by using the **stp bridge-diameter** command and let spanning tree protocols automatically calculate optimal settings of the max age timer. If the network diameter uses the default value, the max age timer also uses the default value.

Related commands: **stp timer forward-delay**, **stp timer hello**, and **stp bridge-diameter**.

Examples

In MSTP mode, set the max age timer to 10 seconds.

```
<Sysname> system-view
[Sysname] stp timer max-age 1000
```

In PVST mode, set the max age timer in VLAN 2 to 10 seconds.

```
<Sysname> system-view
[Sysname] stp mode pvst
[Sysname] stp vlan 2 timer max-age 1000
```

stp timer-factor

Syntax

stp timer-factor *factor*

undo stp timer-factor

View

System view

Default level

2: System level

Parameters

factor: Sets the timeout factor, in the range of 1 to 20.

Description

Use **stp timer-factor** to configure the timeout time by setting the timeout factor.

Timeout time = timeout factor × 3 × hello time.

Use **undo stp timer-factor** to restore the default.

By default, the timeout factor of the switch is set to 3.

After the network topology is stabilized, each non-root-bridge device forwards configuration BPDUs to the surrounding devices at the interval of hello time to check whether any link is faulty. If a device does not receive a BPDU from the upstream device within nine times the hello time, it will assume that the upstream device has failed and start a new spanning tree calculation process.

In a stable network, this kind of spanning tree calculation may occur because the upstream device is busy. You can avoid such unwanted spanning tree calculations by lengthening the timeout time (by setting the timeout factor to 4 or more), saving the network resources. HP recommends you to set the timeout factor to 5, 6, or 7 for a stable network.

Related commands: **stp timer hello**.

Examples

Set the timeout factor of the device to 7.

```
<Sysname> system-view
[Sysname] stp timer-factor 7
```

stp transmit-limit

Syntax

stp transmit-limit *limit*

undo stp transmit-limit

View

Ethernet interface view, port group view, Layer 2 aggregate interface view

Default level

2: System level

Parameters

limit: Sets the maximum number of BPDUs the ports can send within each hello time, in the range of 1 to 255.

Description

Use **stp transmit-limit** to set the maximum number of BPDUs that the ports can send within each hello time.

Use **undo stp transmit-limit** to restore the default.

By default, the maximum transmission rate of all ports is 10. Each port can send up to 10 BPDUs within each hello time.

Configured in Ethernet interface view, the setting takes effect only on the interface.

Configured in port group view, the setting takes effect on all member ports in the port group.

Configured in Layer 2 aggregate interface view, the setting takes effect only on the aggregate interface.

Configured on a member port in an aggregation group, the setting takes effect only after the port leaves the aggregation group.

A larger maximum transmission rate value requires more system resources. An appropriate maximum transmission rate setting can prevent spanning tree protocols from using excessive bandwidth resources during network topology changes. HP recommends that you use the default value.

Examples

Set the maximum transmission rate of port GigabitEthernet 1/0/1 to 5.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] stp transmit-limit 5
```

vlan-mapping modulo

Syntax

vlan-mapping modulo *modulo*

View

MST region view

Default level

2: System level

Parameters

modulo: Sets the modulo value, in the range of 1 to 16.

Description

Use **vlan-mapping modulo** to map VLANs in the MST region to MSTIs according to the specified modulo value, quickly creating a VLAN-to-instance mapping table.

By default, all VLANs are mapped to the CIST (MSTI 0).

You cannot map a VLAN to different MSTIs. If you map a VLAN that has been mapped to an MSTI to a new MSTI, the old mapping will be automatically removed.

This command maps each VLAN to the MSTI whose ID is (VLAN ID - 1) %*modulo* + 1, where (VLAN ID - 1) %*modulo* is the modulo operation for (VLAN ID - 1). If the modulo value is 15, for example, then VLAN 1 will be mapped to MSTI 1, VLAN 2 to MSTI 2, VLAN 15 to MSTI 15, VLAN 16 to MSTI 1, and so on.

Related commands: **region-name**, **revision-level**, **display stp region-configuration**, **check region-configuration**, and **active region-configuration**.

Examples

Map VLANs to MSTIs as per modulo 8.

```
<Sysname> system-view
[Sysname] stp region-configuration
[Sysname-mst-region] vlan-mapping modulo 8
```

BPDU tunneling configuration commands

bpdu-tunnel dot1q

Syntax

In Layer 2 Ethernet interface view or port group view:

bpdu-tunnel dot1q { **cdp** | **dldp** | **eoam** | **gvrp** | **hgmp** | **lacp** | **lldp** | **pagp** | **pvst** | **stp** | **udld** | **vtp** }

undo bpdu-tunnel dot1q { **cdp** | **dldp** | **eoam** | **gvrp** | **hgmp** | **lacp** | **lldp** | **pagp** | **pvst** | **stp** | **udld** | **vtp** }

In Layer 2 aggregate interface view:

bpdu-tunnel dot1q { **cdp** | **gvrp** | **hgmp** | **pvst** | **stp** | **vtp** }

undo bpdu-tunnel dot1q { **cdp** | **gvrp** | **hgmp** | **pvst** | **stp** | **vtp** }

View

Layer 2 Ethernet interface view, port group view, Layer 2 aggregate interface view

Default level

2: System level

Parameters

cdp: Specifies the Cisco Discovery Protocol (CDP).

dldp: Specifies the Device Link Detection Protocol (DLDP).

eoam: Specifies Ethernet Operation, Administration and Maintenance (EOAM).

gvrp: Specifies the GARP VLAN Registration Protocol (GVRP).

hgmp: Specifies the HW Group Management Protocol (HGMP).

lacp: Specifies the Link Aggregation Control Protocol (LACP).

lldp: Specifies the Link Layer Discovery Protocol (LLDP).

pagp: Specifies the Port Aggregation Protocol (PAGP).

pvst: Specifies Per VLAN Spanning Tree (PVST).

stp: Specifies the Spanning Tree Protocol (STP).

udld: Specifies Unidirectional Link Direction (UDLD).

vtp: Specifies the VLAN Trunking Protocol (VTP).

Description

Use **bpdu-tunnel dot1q** to enable BPDU tunneling for a protocol on the ports.

Use **undo bpdu-tunnel dot1q** to disable BPDU tunneling for a protocol on the ports.

By default, BPDU tunneling for any protocol is disabled.

Settings made in Layer 2 Ethernet interface view or Layer 2 aggregate interface view take effect only on the Ethernet interface or aggregate interface. Settings made in port group view take effect on all ports in the port group.

Before enabling BPDU tunneling for DLDP, EOAM, GVRP, HGMP, LLDP, or STP on a port, disable the protocol on the port first.

To enable BPDU tunneling for PVST (which is a spanning tree protocol) on a port, disable STP first and then enable BPDU tunneling for STP on the port.

Do not enable BPDU tunneling for DLDP, EOAM, LACP, LLDP, PAGP, or UDLD on the member port of a Layer 2 aggregation group.

Examples

\# Disable STP on GigabitEthernet 1/0/1, and then enable BPDU tunneling for STP on the port.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] undo stp enable
[Sysname-GigabitEthernet1/0/1] bpdu-tunnel dot1q stp
```

\# Disable STP for port group 1, and then enable BPDU tunneling for STP in the port group.

```
<Sysname> system-view
[Sysname] port-group manual 1
[Sysname-port-group-manual-1] group-member gigabitethernet 1/0/1 to gigabitethernet
1/0/6
[Sysname-port-group-manual-1] undo stp enable
[Sysname-port-group-manual-1] bpdu-tunnel dot1q stp
```

\# Disable STP on Layer 2 aggregate interface Bridge-Aggregation 1, and then enable BPDU tunneling for STP on the Layer 2 aggregate interface.

```
<Sysname> system-view
[Sysname] interface bridge-aggregation 1
[Sysname-Bridge-Aggregation1] undo stp enable
[Sysname-Bridge-Aggregation1] bpdu-tunnel dot1q stp
```

bpdu-tunnel tunnel-dmac

Syntax

bpdu-tunnel tunnel-dmac *mac-address*

undo bpdu-tunnel tunnel-dmac

View

System view

Default level

2: System level

Parameters

mac-address: Specifies a destination multicast MAC address for BPDUs, in the format of H-H-H. The allowed values are 0x0100-0CCD-CDD0, 0x0100-0CCD-CDD1, 0x0100-0CCD-CDD2, and 0x010F-E200-0003.

Description

Use **bpdu-tunnel tunnel-dmac** to configure the destination multicast MAC address for BPDUs.

Use **undo bpdu-tunnel tunnel-dmac** to restore the default value.

By default, the destination multicast MAC address for BPDUs is 0x010F-E200-0003.

Examples

Set the destination multicast MAC address for BPDUs to 0x0100-0CCD-CDD0.

```
<Sysname> system-view
[Sysname] bpdu-tunnel tunnel-dmac 0100-0ccd-cdd0
```

VLAN configuration commands

Basic VLAN configuration commands

default

Syntax

default

View

VLAN interface view

Default level

2: System level

Parameters

None

Description

> △ CAUTION:
>
> The **default** command might interrupt ongoing network services. Make sure you are fully aware of the impacts of this command when you perform it on a live network.

Use **default** to restore the default settings for a VLAN interface.

This command might fail to restore the default settings for some commands for reasons such as command dependencies and system restrictions. You can use the **display this** command in interface view to check for these commands, and perform their **undo** forms or follow the command reference to individually restore their default settings. If your restoration attempt still fails, follow the error message to resolve the problem.

Examples

Restore the default settings for VLAN-interface 1.

```
<Sysname> system-view
[Sysname] interface vlan-interface 1
[Sysname-Vlan-interface1] default
This command will restore the default settings. Continue? [Y/N]:y
```

description

Syntax

description *text*

undo description

View

VLAN view, VLAN interface view

Default level

2: System level

Parameters

text: Specifies the description of a VLAN or VLAN interface. The string can include case-sensitive letters, digits, special characters such as tilde (~), exclamation point (!), at sign (@), pound sign (#), dollar sign ($), percent sign (%), caret (^), ampersand sign (&), asterisk (*), left brace({), right brace (}), left parenthesis ((), right parenthesis ()), left bracket ([), right bracket (]), left angle bracket (<), right angle bracket (>), hyphen (-), underscore(_), plus sign (+), equal sign (=), vertical bar (|), back slash (\), colon (:), semi-colon (;), quotation marks ("), apostrophe ('), comma (,), dot (.), and slash (/), spaces, and other Unicode characters and symbols.

- For a VLAN, this is a string of 1 to 32 characters.
- For a VLAN interface, this is a string of 1 to 80 characters.

When you specify a description, follow these guidelines:

- Each Unicode character takes the space of two regular characters.
- To use Unicode characters or symbols in an interface description, install the specific input method editor and log in to the device through remote login software that supports the character type.
- When the length of a description string reaches or exceeds the maximum line width on the terminal software, the software starts a new line, possibly breaking a Unicode character into two. As a result, garbled characters may be displayed at the end of a line.

Description

Use **description** to change the description of the VLAN or VLAN interface.

Use **undo description** to restore the default.

- The default description for a VLAN is the VLAN ID. For example, **VLAN 0001**.
- The default description for a VLAN interface is the name of the interface. For example, **Vlan-interface 1 Interface**.

You can configure a description to describe the function or connection of a VLAN or VLAN interface for easy management.

Related commands: **display interface vlan-interface** and **display vlan**.

Examples

Change the description of VLAN 2 to **sales-private**.

```
<Sysname> system-view
[Sysname] vlan 2
[Sysname-vlan2] description sales-private
```

Change the description of VLAN-interface 2 to **linktoPC56**.

```
<Sysname> system-view
[Sysname] vlan 2
[Sysname-vlan2] quit
[Sysname] interface vlan-interface 2
[Sysname-Vlan-interface2] description linktoPC56
```

display interface vlan-interface

Syntax

> **display interface** [**vlan-interface**] [**brief** [**down**]] [**|** { **begin** | **exclude** | **include** } *regular-expression*]
>
> **display interface vlan-interface** *vlan-interface-id* [**brief**] [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

> Any view

Default level

> 1: Monitor level

Parameters

> *vlan-interface-id*: Specifies a VLAN interface number.
>
> **brief**: Displays brief interface information. If you do not specify this keyword, the command displays detailed interface information.
>
> **down**: Displays information about interfaces in the DOWN state and the causes. If you do not specify this keyword, this command displays information about interfaces in all states.
>
> **|**: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.
>
> **begin**: Displays the first line that matches the specified regular expression and all lines that follow.
>
> **exclude**: Displays all lines that do not match the specified regular expression.
>
> **include**: Displays all lines that match the specified regular expression.
>
> *regular-expression*: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

> Use **display interface vlan-interface** to display information about a specified or all VLAN interfaces.
>
> If you do not provide the **vlan-interface** keyword, this command displays information about all interfaces.
>
> If you provide the **vlan-interface** keyword but do not specify the VLAN interface number, this command displays information about all VLAN interfaces.
>
> Related commands: **reset counters interface vlan-interface**.

Examples

> \# Display information for VLAN-interface 2.
>
> ```
> <Sysname> display interface vlan-interface 2
> Vlan-interface2 current state: DOWN
> Line protocol current state: DOWN
> Description: Vlan-interface2 Interface
> The Maximum Transmit Unit is 1500
> Internet protocol processing : disabled
> IP Packet Frame Type: PKTFMT_ETHNT_2,  Hardware Address: 000f-e249-8050
> IPv6 Packet Frame Type: PKTFMT_ETHNT_2,  Hardware Address: 000f-e249-8050
> Last clearing of counters:  Never
>     Last 300 seconds input:  0 bytes/sec 0 packets/sec
>     Last 300 seconds output:  0 bytes/sec 0 packets/sec
> ```

```
     0 packets input, 0 bytes, 0 drops
     0 packets output, 0 bytes, 0 drops
```

Display brief information for VLAN-interface 2.

```
<Sysname> display interface vlan-interface 2 brief
The brief information of interface(s) under route mode:
Link: ADM - administratively down; Stby - standby
Protocol: (s) - spoofing
Interface           Link Protocol Main IP       Description
Vlan2               DOWN DOWN     --
```

Display brief information for VLAN interfaces in DOWN state.

```
<Sysname> display interface vlan-interface brief down
The brief information of interface(s) under route mode:
Link: ADM - administratively down; Stby - standby
Interface           Link Cause
Vlan2               DOWN Not connected
```

Table 33 Command output

Field	Description
Vlan-interface2 current state	Physical state of a VLAN interface: • **DOWN (Administratively)**—The administrative state of the VLAN interface is down, because it has been shut down with the **shutdown** command. • **DOWN**—The administrative sate of the VLAN interface is up, but its physical sate is down. The VLAN corresponding to this interface does not contain any physical port in the UP state (possibly because the ports are not well connected or the lines have failed). • **UP**—Both the administrative state and the physical state of the VLAN interface are up.
Line protocol current state	Link layer protocol state of a VLAN interface: • **DOWN**—The protocol state of the VLAN interface is down. • **UP**—The protocol state of the VLAN interface is up.
Description	Description string of a VLAN interface.
The Maximum Transmit Unit	MTU of a VLAN interface.
Internet protocol processing : disabled	The interface is not capable of processing IP packets. This information is displayed when the interface is not configured with an IP address.
Internet Address is 192.168.1.54/24 Primary	The primary IP address of the interface is 192.168.1.54/24. This information is displayed only if the primary IP address is configured for the interface.
Internet Address is 6.4.4.4/24 Sub	The secondary IP address of the interface is 6.4.4.4/24. This information is displayed only if a secondary IP address is configured for the interface.
IP Packet Frame Type	IPv4 outgoing frame format.
Hardware address	MAC address corresponding to a VLAN interface.
IPv6 Packet Frame Type	IPv6 outgoing frame format.

Field	Description
Last clearing of counters	Time when the **reset counters interface vlan-interface** command was last used to clear the interface statistics. **Never** indicates the **reset counters interface** command has never been used on the interface since the device's startup.
Last 300 seconds input: 0 bytes/sec 0 packets/sec	Average rate of input packets in the last 300 seconds (in bps and pps).
Last 300 seconds output: 0 bytes/sec 0 packets/sec	Average rate of output packets in the last 300 seconds (in bps and pps).
0 packets input, 0 bytes, 0 drops	Total number and size (in bytes) of the received packets of the interface and the number of the dropped packets.
0 packets output, 0 bytes, 0 drops	Total number and size (in bytes) of the sent packets of the interface and the number of the dropped packets.
The brief information of interface(s) under route mode	Brief information about Layer 3 interfaces.
Link: ADM - administratively down; Stby - standby	Link layer state of the interface: • **ADM**—The interface has been administratively shut down. To recover its physical state, perform the **undo shutdown** command. • **Stby**—The interface is operating as a standby interface.
Protocol: (s) - spoofing	If the network layer protocol state of an interface is shown as UP, but its link is an on-demand link or not present at all, its protocol attribute includes the spoofing flag (an s in parentheses).
Interface	Abbreviated interface name.
Link	Physical link state of the interface: • **UP**—The link is up. • **ADM**—The link has been administratively shut down. To recover its physical state, perform the **undo shutdown** command.
Protocol	Protocol connection state of the interface, which can be UP, DOWN, or UP(s).
Main IP	Main IP address of the interface.
Description	Description of the interface.
Cause	Cause of a DOWN physical link. If the port has been shut down with the **shutdown** command, this field displays **Administratively**. To restore the physical state of the interface, use the **undo shutdown** command.

display vlan

Syntax

display vlan [*vlan-id1* [**to** *vlan-id2*] | **all** | **dynamic** | **reserved** | **static**] [| { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

1: Monitor level

Parameters

vlan-id1: Displays information about a VLAN specified by VLAN ID, in the range of 1 to 4094.

vlan-id1 **to** *vlan-id2*: Displays information about VLANs specified by a VLAN ID range. The *vlan-id2* argument cannot be smaller than the *vlan-id1* argument.

all: Displays all VLAN information but the reserved VLANs.

dynamic: Displays the number of dynamic VLANs and the ID for each dynamic VLAN. The dynamic VLANs are generated through GVRP, MVRP, or those distributed by a RADIUS server.

reserved: Displays information about the reserved VLANs. Protocol modules determine which VLANs are reserved VLANs according to function implementation, and reserved VLANs serve protocol modules. You cannot configure reserved VLANs.

static: Displays the number of static VLANs and the ID for each static VLAN. The static VLANs are manually created.

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display vlan** to display VLAN information.

Related commands: **vlan**.

Examples

Display VLAN 2 information.
```
<Sysname> display vlan 2
VLAN ID: 2
 VLAN Type: static
 Route interface: not configured
 Description: VLAN 0002
 Name: VLAN 0002
Tagged   Ports: none
 Untagged Ports:
    GigabitEthernet1/0/1  GigabitEthernet1/0/2  GigabitEthernet1/0/3
```

Display VLAN 3 information.
```
<Sysname> display vlan 3
 VLAN ID: 3
 VLAN Type: static
 Route Interface: configured
 IPv4 address: 1.1.1.1
 IPv4 subnet mask: 255.255.255.0
 IPv6 global unicast address(es):
```

```
     2001::1, subnet is 2001::/64 [TENTATIVE]
Description: VLAN 0003
 Name: VLAN 0003
 Tagged   Ports: none
 Untagged Ports: none
```

Table 34 Command output

Field	Description
VLAN Type	VLAN type, static or dynamic.
Route interface	Indicates whether the VLAN interface is configured or not.
Description	Description of the VLAN.
Name	Name configured for the VLAN.
IPv4 address	Primary IPv4 address of the VLAN interface (available only when an IPv4 address is configured for the VLAN interface). To display secondary IP addresses, use the **display interface vlan-interface** command in any view or the **display this** command in VLAN interface view.
IPv4 subnet mask	Subnet mask of the primary IPv4 address (available only when an IPv4 address is configured for the VLAN interface).
IPv6 global unicast address(es)	Global unicast IPv6 address of the VLAN interface (available only when an IPv6 address is configured for the VLAN interface).
Tagged Ports	Ports through which VLAN packets are sent tagged.
Untagged Ports	Ports through which VLAN packets are sent untagged.

interface vlan-interface

Syntax

interface vlan-interface *vlan-interface-id*

undo interface vlan-interface *vlan-interface-id*

View

System view

Default level

2: System level

Parameters

vlan-interface-id: Specifies a VLAN interface number, in the range of 1 to 4094.

Description

Use **interface vlan-interface** to create a VLAN interface and enter its view or enter the view of an existing VLAN interface.

Use **undo interface vlan-interface** to remove the specified VLAN interface.

Create the VLAN before you create the VLAN interface.

To configure an IP address for a VLAN interface that will perform IP routing, use the **ip address** command in VLAN interface view.

Related commands: **display interface vlan-interface**.

Examples

Create VLAN-interface 2.

```
<Sysname> system-view
[Sysname] vlan 2
[Sysname-vlan2] quit
[Sysname] interface vlan-interface 2
[Sysname-Vlan-interface2]
```

ip address

Syntax

ip address *ip-address* { *mask* | *mask-length* } [**sub**]

undo ip address [*ip-address* { *mask* | *mask-length* } [**sub**]]

View

VLAN interface view

Default level

2: System level

Parameters

ip-address: Specifies an IP address in dotted decimal notation.

mask: Specifies a subnet mask in dotted decimal notation.

mask-length: Sets the number of consecutive 1s in the subnet mask, in the range of 0 to 32.

sub: Indicates the address is a secondary IP address.

Description

Use **ip address** to assign an IP address and subnet mask to a VLAN interface.

Use **undo ip address** to remove the IP address and subnet mask for a VLAN interface.

By default, no IP address is assigned to any VLAN interface.

To connect a VLAN to multiple subnets, assign one primary IP address and multiple secondary IP addresses to a VLAN interface.

When you configure IP addresses for a VLAN interface, follow these rules:

- The primary IP address you assign to a VLAN interface overwrites the previous one, if any.
- Remove all secondary IP addresses before you remove the primary IP address.
- To remove all IP addresses, use the **undo ip address** command without any parameter.
- To remove the primary IP address, use the **undo ip address** *ip-address* { *mask* | *mask-length* } command.
- To remove a secondary IP address, use the **undo ip address** [*ip-address* { *mask* | *mask-length* } [**sub**]] command

Related commands: **display ip interface** (*Layer 3—IP Services Command Reference*).

Examples

Specify the IP address as 1.1.0.1, the subnet mask as 255.255.255.0 for VLAN interface 1.

```
<Sysname> system-view
[Sysname] interface vlan-interface 1
[Sysname-Vlan-interface1] ip address 1.1.0.1 255.255.255.0
```

mtu

Syntax

mtu *size*

undo mtu

View

VLAN interface view

Default level

2: System level

Parameters

size: Sets the maximum transmission unit (MTU), in the range of 46 to 1500 bytes.

Description

Use **mtu** to set the MTU for a VLAN interface.

Use **undo mtu** to restore the default.

By default, the MTU of a VLAN interface is 1500 bytes.

Related commands: **display interface vlan-interface**.

Examples

Set the MTU to 1492 bytes for VLAN-interface 1.
```
<Sysname> system-view
[Sysname] interface vlan-interface 1
[Sysname-Vlan-interface1] mtu 1492
```

name

Syntax

name *text*

undo name

View

VLAN view

Default level

2: System level

Parameters

text: Specifies a VLAN name, a string of 1 to 32 characters. The string can include case-sensitive letters, digits, special characters such as tilde (~), exclamation point (!), at sign (@), pound sign (#), dollar sign ($), percent sign (%), caret (^), ampersand sign (&), asterisk (*), left brace({), right brace (}), left parenthesis ((), right parenthesis ()), left bracket ([), right bracket (]), left angle bracket (<), right angle bracket (>), hyphen (-), underscore(_), plus sign (+), equal sign (=), vertical bar (|), back slash (\), colon

157

(:), semi-colon (;) quotation marks ("), apostrophe ('), comma (,), dot (.), and slash (/), spaces, and other Unicode characters and symbols.

Description

Use **name** to configure a name for the VLAN.

Use **undo name** to restore the default name of the VLAN.

By default, the name of a VLAN is its VLAN ID, for example, **VLAN 0001**.

When 802.1X or MAC address authentication is configured on a switch, you can use a RADIUS server to issue VLAN configuration to ports that have passed the authentication. Some servers can send IDs or names of the issued VLANs to the switch.

Use VLAN names rather than VLAN IDs to distinguish a large number of VLANs.

Related commands: **display vlan**.

Examples

Configure the name of VLAN 2 as **Test VLAN**.

```
<Sysname> system-view
[Sysname] vlan 2
[Sysname-vlan2] name Test VLAN
```

reset counters interface vlan-interface

Syntax

reset counters interface vlan-interface [*vlan-interface-id*]

View

User view

Default level

2: System level

Parameters

vlan-interface-id: Specifies a VLAN interface number.

Description

Use **reset counters interface vlan-interface** to clear the statistics on a VLAN interface.

Before collecting the traffic statistics within a specific period of time on an interface, clear the existing statistics first.

If the *vlan-interface-id* argument is not specified, this command clears the statistics of all VLAN interfaces.

If the *vlan-interface-id* argument is specified, this command clears the statistics of the specified VLAN interface.

Related commands: **display interface vlan-interface**.

Examples

Clear the statistics on VLAN-interface 2.

```
<Sysname> reset counters interface vlan-interface 2
```

shutdown

Syntax

shutdown

undo shutdown

View

VLAN interface view

Default level

2: System level

Parameters

None

Description

Use **shutdown** to manually shut down a VLAN interface.

Use **undo shutdown** to cancel the action of shutting down a VLAN interface.

By default, a VLAN interface is not manually shut down. The VLAN interface is up if one or more ports in the VLAN is up, and goes down if all ports in the VLAN go down.

A VLAN interface shut down with the **shutdown** command is in DOWN (Administratively) state until you bring it up, regardless of how the state of the ports in the VLAN changes.

Before configuring parameters for a VLAN interface, shut down the VLAN interface with the **shutdown** command to prevent the configurations from affecting the network. Use the **undo shutdown** command to bring up a VLAN interface after you have configured related parameters and protocols for the VLAN interface.

You can shut down a failed interface with the **shutdown** command and then bring it up with the **undo shutdown** command to see if it recovers.

In a VLAN, the state of any Ethernet port is independent of the state of the VLAN interface.

Examples

\# Shut down VLAN-interface 2 and then bring it up.

```
<Sysname> system-view
[Sysname] interface vlan-interface 2
[Sysname-Vlan-interface2] shutdown
[Sysname-Vlan-interface2] undo shutdown
```

vlan

Syntax

vlan { *vlan-id1* [**to** *vlan-id2*] | **all** }

undo vlan { *vlan-id1* [**to** *vlan-id2*] | **all** }

View

System view

Default level

2: System level

Parameters

vlan-id1, *vlan-id2*: Specifies a VLAN ID, in the range of 1 to 4094.

vlan-id1 **to** *vlan-id2*: Specifies a VLAN range. The *vlan-id2* argument cannot be smaller than the *vlan-id1* argument.

all: Creates or removes all VLANs except reserved VLANs. The keyword is not supported when the maximum number of VLANs that can be created on a device is less than 4094.

Description

Use **vlan** *vlan-id* to create a VLAN and enter its view or enter the view of an existing VLAN.

Use **vlan** *vlan-id1* **to** *vlan-id2* to create VLANs in the range of *vlan-id1* to *vlan-id2*, except reserved VLANs.

Use **undo vlan** to remove the specified VLANs.

By default, only the default VLAN (VLAN 1) exists.

You cannot create or remove the default VLAN (VLAN 1).

You cannot create or remove reserved VLANs reserved for specific functions.

For the following VLANs, you must remove the related configurations first, because you cannot use the **undo vlan** command to directly remove them:

- Protocol reserved VLANs
- Voice VLANs
- Management VLANs
- Dynamic VLANs
- VLANs configured with QoS policies
- Control VLANs configured for smart link groups or RRPP domains
- Remote probe VLANs for remote port mirroring

Related commands: **display vlan**.

Examples

Create VLAN 2, and enter VLAN 2 view.

```
<Sysname> system-view
[Sysname] vlan 2
[Sysname-vlan2]
```

Create VLAN 4 through VLAN 100.

```
<Sysname> system-view
[Sysname] vlan 4 to 100
Please wait............ Done.
```

Port-based VLAN configuration commands

display port

Syntax

display port { **hybrid** | **trunk** } [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

1: Monitor level

Parameters

hybrid: Displays hybrid ports.

trunk: Displays trunk ports.

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display port** to display information about the hybrid or trunk ports on the device, including the port names, PVIDs, and allowed VLAN IDs.

Examples

Display information about the hybrid ports in the system.
```
<Sysname> display port hybrid
Interface          PVID  VLAN passing
GE1/0/4             100   Tagged:  1000, 1002, 1500, 1600-1611, 2000,
                                   2555-2558, 3000, 4000
                          Untagged:1, 10, 15, 18, 20-30, 44, 55, 67, 100,
                                   150-160, 200, 255, 286, 300-302
```

Display information about the trunk ports in the system.
```
<Sysname> display port trunk
Interface          PVID  VLAN passing
GE1/0/8             2     1-4, 6-100, 145, 177, 189-200, 244, 289, 400,
                          555, 600-611, 1000, 2006-2008
```

Table 35 Command output

Field	Description
Interface	Port name
PVID	PVID of the port
VLAN passing	VLANs for which the port allows packets to pass through
Tagged	VLANs for which the port sends packets without removing VLAN tags
Untagged	VLANs for which the port sends packets after removing VLAN tags

port

Syntax

port *interface-list*

undo port *interface-list*

View

VLAN view

Default level

2: System level

Parameters

interface-list: Specifies an interface list, in the format of *interface-list* = { *interface-type interface-number* [**to** *interface-type interface-number*] }&<1-10>, where *interface-type interface-number* represents the interface type and interface number and &<1-10> indicates that you can specify up to 10 *interface-type interface-number* [**to** *interface-type interface-number*] parameters.

Description

Use **port** to assign the specified access ports to the VLAN.

Use **undo port** to remove the specified access ports from the VLAN.

By default, all ports are in VLAN 1.

This command is applicable only on access ports.

By default, all ports are access ports. However, you can manually configure the port type. For more information, see "port link-type."

You cannot assign Layer 2 aggregate interfaces to a VLAN.

Related commands: **display vlan**.

Examples

Assign GigabitEthernet 1/0/1 through GigabitEthernet 1/0/3 to VLAN 2.

```
<Sysname> system-view
[Sysname] vlan 2
[Sysname-vlan2] port gigabitethernet 1/0/1 to gigabitethernet 1/0/3
```

port access vlan

Syntax

port access vlan *vlan-id*

undo port access vlan

View

Layer 2 Ethernet interface view, port group view, Layer 2 aggregate interface view

Default level

2: System level

Parameters

vlan-id: Specifies a VLAN ID, in the range of 1 to 4094. Verify that the VLAN specified by the VLAN ID already exists.

Description

Use **port access vlan** to assign the access ports to the specified VLAN.

Use **undo port access vlan** to restore the default.

By default, all access ports belong to VLAN 1.

The configuration made in Layer 2 Ethernet interface view, applies only to the port.

The configuration made in port group view applies to all ports in the port group.

The configuration made in Layer 2 aggregate interface view applies to the aggregate interface and its aggregation member ports.

- If the system fails to apply the configuration to the aggregate interface, it stops applying the configuration to aggregation member ports.
- If the system fails to apply the configuration to an aggregation member port, it skips the port and moves to the next member port.

Examples

Assign GigabitEthernet 1/0/1 to VLAN 3.

```
<Sysname> system-view
[Sysname] vlan 3
[Sysname-vlan3] quit
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] port access vlan 3
```

Assign Layer 2 aggregate interface Bridge-Aggregation 1 and its member ports to VLAN 3.

```
<Sysname> system-view
[Sysname] vlan 3
[Sysname-vlan3] quit
[Sysname] interface bridge-aggregation 1
[Sysname-Bridge-Aggregation1] port access vlan 3
```

port hybrid pvid

Syntax

port hybrid pvid vlan *vlan-id*

undo port hybrid pvid

View

Layer 2 Ethernet interface view, port group view, Layer 2 aggregate interface view

Default level

2: System level

Parameters

vlan-id: Specifies a VLAN ID, in the range of 1 to 4094.

Description

Use **port hybrid pvid** to configure the PVID of the hybrid port.

Use **undo port hybrid pvid** to restore the default.

By default, the PVID of a hybrid port is VLAN 1.

You can use a nonexistent VLAN as the PVID for a hybrid port. If you use the **undo vlan** command to remove the PVID of a hybrid port, it does not affect the setting of the PVID on the port.

The configuration made in Layer 2 Ethernet interface view applies only to the port.

The configuration made in port group view applies to all ports in the port group.

The configuration made in Layer 2 aggregate interface view applies to the aggregate interface and its aggregation member ports.

- If the system fails to apply the configuration to the aggregate interface, it stops applying the configuration to aggregation member ports.
- If the system fails to apply the configuration to an aggregation member port, it skips the port and moves to the next member port.

HP recommends that you set the same PVID for the local and remote hybrid ports.

You must use the **port hybrid vlan** command to configure the hybrid port to allow and forward packets from the PVID.

Related commands: **port link-type** and **port hybrid vlan**.

Examples

Configure VLAN 100 as the PVID of the hybrid port GigabitEthernet 1/0/1.

```
<Sysname> system-view
[Sysname] vlan 100
[Sysname-vlan100] quit
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] port link-type hybrid
[Sysname-GigabitEthernet1/0/1] port hybrid pvid vlan 100
```

Configure VLAN 100 as the PVID of the hybrid Layer 2 aggregate interface Bridge-Aggregation 1.

```
<Sysname> system-view
[Sysname] interface bridge-aggregation 1
[Sysname-Bridge-Aggregation1] port link-type hybrid
[Sysname-Bridge-Aggregation1] port hybrid pvid vlan 100
```

port hybrid vlan

Syntax

port hybrid vlan *vlan-list* { **tagged** | **untagged** }

undo port hybrid vlan *vlan-list*

View

Layer 2 Ethernet interface view, port group view, Layer 2 aggregate interface view

Default level

2: System level

164

Parameters

vlan-list: Specifies a list of VLANs that the hybrid ports will be assigned to, in the format of [*vlan-id1* [**to** *vlan-id2*]]&<1-10>, where *vlan-id1* and *vlan-id2* represent VLAN IDs and each range from 1 to 4094 and &<1-10> indicates that you can specify up to 10 *vlan-id1* [**to** *vlan-id2*] parameters. The *vlan-id2* argument cannot be smaller than the *vlan-id1* argument. Make sure the specified VLANs already exist.

tagged: Configures the ports to send tagged packets of the specified VLANs.

untagged: Configures the ports to send untagged packets of the specified VLANs.

Description

Use **port hybrid vlan** to assign the hybrid ports to the specified VLANs.

Use **undo port hybrid vlan** to remove the hybrid ports from the specified VLANs.

By default, a hybrid port only allows packets from VLAN 1 to pass through untagged.

A hybrid port can carry multiple VLANs. If you execute the **port hybrid vlan** command multiple times, the VLANs the hybrid port carries are the set of VLANs specified by *vlan-list* in each execution.

The configuration made in Layer 2 Ethernet interface view applies only to the port.

The configuration made in port group view applies to all ports in the port group.

The configuration made in Layer 2 aggregate interface view applies to the aggregate interface and its aggregation member ports.

- If the system fails to apply the configuration to the aggregate interface, it stops applying the configuration to aggregation member ports.
- If the system fails to apply the configuration to an aggregation member port, it skips the port and moves to the next member port.

Related commands: **port link-type**.

Examples

Assign the hybrid port GigabitEthernet 1/0/1 to VLAN 2, VLAN 4, and VLAN 50 through VLAN 100, and configure GigabitEthernet 1/0/1 to send packets of these VLANs with tags kept.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] port link-type hybrid
[Sysname-GigabitEthernet1/0/1] port hybrid vlan 2 4 50 to 100 tagged
```

Assign hybrid ports in port group 2 to VLAN 2, and configure these hybrid ports to send packets of VLAN 2 with VLAN tags removed.

```
<Sysname> system-view
[Sysname] vlan 2
[Sysname-vlan2] quit
[Sysname] port-group manual 2
[Sysname-port-group-manual-2] group-member gigabitethernet 1/0/1 to gigabitethernet
1/0/6
[Sysname-port-group-manual-2] port link-type hybrid
[Sysname-port-group-manual-2] port hybrid vlan 2 untagged
 Configuring GigabitEthernet1/0/1... Done.
 Configuring GigabitEthernet1/0/2... Done.
 Configuring GigabitEthernet1/0/3... Done.
 Configuring GigabitEthernet1/0/4... Done.
```

```
 Configuring GigabitEthernet1/0/5... Done.
 Configuring GigabitEthernet1/0/6... Done.
```

Assign the hybrid Layer 2 aggregate interface Bridge-Aggregation 1 and its member ports to VLAN 2, and configure them to send packets of VLAN 2 with tags removed.

```
<Sysname> system-view
[Sysname] interface bridge-aggregation 1
[Sysname-Bridge-Aggregation1] port link-type hybrid
[Sysname-Bridge-Aggregation1] port hybrid vlan 2 untagged
 Please wait... Done.
 Configuring GigabitEthernet1/0/1... Done.
 Configuring GigabitEthernet1/0/2... Done.
 Configuring GigabitEthernet1/0/3... Done.
```

The output shows that GigabitEthernet 1/0/1, GigabitEthernet 1/0/2, and GigabitEthernet 1/0/3 are the member ports of the aggregation group corresponding to Bridge-Aggregation 1.

port link-type

Syntax

port link-type { **access** | **hybrid** | **trunk** }

undo port link-type

View

Layer 2 Ethernet interface view, port group view, Layer 2 aggregate interface view

Default level

2: System level

Parameters

access: Configures the link type of a port as access.

hybrid: Configures the link type of a port as hybrid.

trunk: Configures the link type of a port as trunk.

Description

Use **port link-type** to configure the link type of a port.

Use **undo port link-type** to restore the default link type of a port.

By default, any port is an access port.

The configuration made in Layer 2 Ethernet interface view applies only to the port.

The configuration made in port group view applies to all ports in the port group.

The configuration made in Layer 2 aggregate interface view applies to the aggregate interface and its aggregation member ports.

- If the system fails to apply the configuration to the aggregate interface, it stops applying the configuration to aggregation member ports.
- If the system fails to apply the configuration to an aggregation member port, it skips the port and moves to the next member port.

To change the link type of a port from trunk to hybrid or vice versa, you must set the link type to access.

After you change the link type of an interface with the **port link-type** command, the loopback detection action configured on the interface with the **loopback-detection action** command automatically restores the default. For more information about the loopback detection action configuration, see *Layer 2—LAN Switching Configuration Guide*.

Examples

Configure GigabitEthernet 1/0/1 as a trunk port.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] port link-type trunk
```

Configure all the ports in the manual port group **group1** as hybrid ports.

```
<Sysname> system-view
[Sysname] port-group manual group1
[Sysname-port-group manual group1] group-member gigabitethernet 1/0/1
[Sysname-port-group manual group1] group-member gigabitethernet 1/0/2
[Sysname-port-group manual group1] port link-type hybrid
```

Configure Layer 2 aggregate interface Bridge-Aggregation 1 and its member ports as hybrid ports.

```
<Sysname> system-view
[Sysname] interface bridge-aggregation 1
[Sysname-Bridge-Aggregation1] port link-type hybrid
```

port trunk permit vlan

Syntax

port trunk permit vlan { *vlan-list* | **all** }

undo port trunk permit vlan { *vlan-list* | **all** }

View

Layer 2 Ethernet interface view, port group view, Layer 2 aggregate interface view

Default level

2: System level

Parameters

vlan-list: Specifies a list of VLANs that the trunk ports will be assigned to, in the format of [*vlan-id1* [**to** *vlan-id2*]]&<1-10>, where *vlan-id1* and *vlan-id2* represent VLAN IDs and each range from 1 to 4094 and &<1-10> indicates that you can specify up to 10 *vlan-id1* [**to** *vlan-id2*] parameters. The *vlan-id2* argument cannot be smaller than the *vlan-id1* argument.

all: Permits all VLANs to pass through the trunk ports.

Description

Use **port trunk permit vlan** to assign the trunk ports to the specified VLANs.

Use **undo port trunk permit vlan** to remove the trunk ports from the specified VLANs.

By default, a trunk port allows only packets from VLAN 1 to pass through.

A trunk port can carry multiple VLANs. If you execute the **port trunk permit vlan** command multiple times, the trunk port carries the set of VLANs specified by *vlan-list* in each execution.

The **port trunk permit vlan all** command can be ineffective to voice VLANs. If you are prompted with a configuration error message when using this command, use the **display this** command to view the execution result.

On a trunk port, only traffic of the PVID can pass through untagged.

The configuration made in Layer 2 Ethernet interface view applies only to the port.

The configuration made in port group view applies to all ports in the port group.

The configuration made in Layer 2 aggregate interface view applies to the aggregate interface and its aggregation member ports.

- If the system fails to apply the configuration to the aggregate interface, it stops applying the configuration to aggregation member ports.
- If the system fails to apply the configuration to an aggregation member port, it skips the port and moves to the next member port.

To prevent unauthorized VLAN users from accessing restricted resources through a port, use the **port trunk permit vlan all** command with caution on the port.

Related commands: **port link-type**.

Examples

Assign the trunk port GigabitEthernet 1/0/1 to VLAN 2, VLAN 4, and VLAN 50 through VLAN 100.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] port link-type trunk
[Sysname-GigabitEthernet1/0/1] port trunk permit vlan 2 4 50 to 100
Please wait........... Done.
```

Assign the trunk Layer 2 aggregate interface Bridge-Aggregation 1 to VLAN 2.

```
<Sysname> system-view
[Sysname] interface bridge-aggregation 1
[Sysname-Bridge-Aggregation1] port link-type trunk
[Sysname-Bridge-Aggregation1] port trunk permit vlan 2
 Please wait... Done.
 Configuring GigabitEthernet1/0/1... Done.
 Configuring GigabitEthernet1/0/2... Done.
 Configuring GigabitEthernet1/0/3... Done.
```

The output shows that GigabitEthernet 1/0/1, GigabitEthernet 1/0/2, and GigabitEthernet 1/0/3 are the member ports of the aggregation group corresponding to Bridge-Aggregation 1.

port trunk pvid

Syntax

port trunk pvid vlan *vlan-id*

undo port trunk pvid

View

Layer 2 Ethernet interface view, port group view, Layer 2 aggregate interface view

Default level

2: System level

Parameters

vlan-id: Specifies a VLAN ID, in the range of 1 to 4094

Description

Use **port trunk pvid** to configure the PVID for the trunk port.

Use **undo port trunk pvid** to restore the default.

By default, the PVID of a trunk port is VLAN 1.

You can use a nonexistent VLAN as the PVID for a trunk port. If you use the **undo vlan** command to remove the PVID of a hybrid port, it does not affect the setting of the PVID on the port.

The configuration made in Layer 2 Ethernet interface view applies only to the port.

The configuration made in port group view applies to all ports in the port group.

The configuration made in Layer 2 aggregate interface view applies to the aggregate interface and its aggregation member ports.

- If the system fails to apply the configuration to the aggregate interface, it stops applying the configuration to aggregation member ports.
- If the system fails to apply the configuration to an aggregation member port, it skips the port and moves to the next member port.

The local and remote trunk ports must use the same PVID for the traffic of the PVID to be transmitted properly.

You must use the **port trunk permit vlan** command to configure the trunk port to allow and forward packets from the PVID.

Related commands: **port link-type** and **port trunk permit vlan**.

Examples

Configure VLAN 100 as the PVID of the trunk port GigabitEthernet 1/0/1.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] port link-type trunk
[Sysname-GigabitEthernet1/0/1] port trunk pvid vlan 100
```

Configure VLAN 100 as the PVID of the trunk Layer 2 aggregate interface Bridge-Aggregation 1.

```
<Sysname> system-view
[Sysname] interface bridge-aggregation 1
[Sysname-Bridge-Aggregation1] port link-type trunk
[Sysname-Bridge-Aggregation1] port trunk pvid vlan 100
```

MAC-based VLAN configuration commands

display mac-vlan

Syntax

display mac-vlan { **all** | **dynamic** | **mac-address** *mac-address* | **static** | **vlan** *vlan-id* } [| { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

1: Monitor level

Parameters

all: Displays all the MAC address-to-VLAN entries.

dynamic: Displays dynamically configured MAC address-to-VLAN entries.

mac-address *mac-address*: Displays the MAC address-to-VLAN entry containing the specified MAC address.

static: Displays the statically configured MAC address-to-VLAN entries.

vlan *vlan-id*: Displays the MAC address-to-VLAN entries associated with the specified VLAN.

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display mac-vlan** to display the specified MAC address-to-VLAN entries.

If **mac-address** *mac-address* is specified but **mask** is not specified, only the MAC address-to-VLAN entry containing the specified MAC address is displayed.

Examples

Display all the MAC address-to-VLAN entries.

```
<Sysname> display mac-vlan all
The following MAC-VLAN address exist:
S: Static   D: Dynamic
MAC ADDR          MASK                    VLAN ID  PRIO    STATE
----------------------------------------------------------------
0008-0001-0000    FFFF-FFFF-FFFF          5        3       S
0002-0001-0000    FFFF-FFFF-FFFF          5        3       S&D

Total MAC VLAN address count:2
```

Table 36 Command output

Field	Description
S: Static	The character **S** stands for the MAC address-to-VLAN entries that are configured statically.
D: Dynamic	The character **D** stands for the MAC address-to-VLAN entries that are configured dynamically.
MAC ADDR	MAC address of a MAC address-to-VLAN entry.
MASK	Mask of the MAC address of a MAC address-to-VLAN entry.

Field	Description
VLAN ID	VLAN ID of a MAC address-to-VLAN entry.
PRIO	802.1p priority corresponding to the MAC address of a MAC address-to-VLAN entry
STATE	State of a MAC address-to-VLAN entry: • **S**—The MAC address-to-VLAN entry is configured statically. • **D**—The MAC address-to-VLAN entry is configured automatically through the authentication server. • **S&D**—The MAC address-to-VLAN entry is configured both statically and dynamically.

display mac-vlan interface

Syntax

display mac-vlan interface [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

1: Monitor level

Parameters

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display mac-vlan interface** to display all the ports with MAC-based VLAN enabled.

Related commands: **mac-vlan enable**.

Examples

Display all the interfaces with MAC-based VLAN enabled.
```
<Sysname> display mac-vlan interface
MAC VLAN is enabled on following ports:
-------------------------------------
GigabitEthernet1/0/1  GigabitEthernet1/0/2  GigabitEthernet1/0/3
```

mac-vlan enable

Syntax

mac-vlan enable

undo mac-vlan enable

View

Layer 2 Ethernet port view

Default level

2: System level

Parameters

None

Description

Use **mac-vlan enable** to enable the MAC-based VLAN feature on a port.

Use **undo mac-vlan enable** to disable the MAC-based VLAN feature on a port.

By default, the MAC-based VLAN feature is disabled on a port.

This command is available only on hybrid ports.

Examples

Enable the MAC-based VLAN feature on GigabitEthernet 1/0/1.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] mac-vlan enable
```

mac-vlan mac-address

Syntax

mac-vlan mac-address *mac-address* **vlan** *vlan-id* [**priority** *pri*]

undo mac-vlan { **all** | **mac-address** *mac-address* | **vlan** *vlan-id* }

View

System view

Default level

2: System level

Parameters

mac-address *mac-address*: Specifies a MAC address.

vlan *vlan-id*: Specifies a VLAN ID, in the range of 1 to 4094.

priority *pri*: Specifies the 802.1p priority value corresponding to the specified MAC address. The *pri* argument ranges from 0 to 7.

all: Removes all the static MAC address-to-VLAN entries.

Description

Use **mac-vlan mac-address** to associate the specified VLAN and priority value with the specified MAC addresses.

Use **undo mac-vlan** to remove the association.

The MAC-to-VLAN entry maintained by the device describes the relationship between a MAC address and a VLAN, and a priority value. The system adds/removes MAC address-to-VLAN entries to/from the table according to the configuration.

172

Examples

Associate a single MAC address 0-1-1 with VLAN 100 and 802.1p priority 7.

```
<Sysname> system-view
[Sysname] mac-vlan mac-address 0-1-1 vlan 100 priority 7
```

mac-vlan trigger enable

Syntax

mac-vlan trigger enable

undo mac-vlan trigger enable

View

Layer 2 Ethernet port view

Default level

2: System level

Parameters

None

Description

Use **mac-vlan trigger enable** to enable dynamic MAC-based VLAN assignment. The port configured with this command will be dynamically assigned to VLANs based on the source MAC addresses of the received packets.

Use **undo mac-vlan trigger enable** to restore the default.

By default, dynamic MAC-based VLAN assignment is not enabled.

After receiving a packet with an unknown source MAC address, a port submits the packet to the CPU.

If the source MAC address matches a MAC address-to-VLAN entry maintained by the device, the device dynamically learns the source MAC address and assigns the receiving port to the corresponding VLAN. Then, subsequent packets with this source MAC address can be directly forwarded through the port.

If the MAC address does not match any MAC address-to-VLAN entry, the device will not dynamically learn the MAC address and assign the receiving port to the corresponding VLAN.

Examples

Enable dynamic MAC-based VLAN assignment on GigabitEthernet 1/0/1.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] mac-vlan trigger enable
```

port pvid disable

Syntax

port pvid disable

undo port pvid disable

View

Layer 2 Ethernet port view

Default level

2: System level

Parameters

None

Description

Use **port pvid disable** to disable the PVID of the port from forwarding packets whose source MAC addresses do not match any MAC address-to-VLAN entry.

Use **undo port pvid disable** to restore the default.

By default, when a port receives a packet with an unknown source MAC address that does not match any MAC address-to-VLAN entry, it forwards the packet in its PVID.

Examples

Disable the PVID of GigabitEthernet 1/0/1 from forwarding packets whose source MAC addresses do not match any MAC address-to-VLAN entry.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] port pvid disable
```

vlan precedence

Syntax

vlan precedence { **mac-vlan** | **ip-subnet-vlan** }

undo vlan precedence

View

Layer 2 Ethernet port view, port group view

Default level

2: System level

Parameters

mac-vlan: Matches VLANs based on single MAC addresses preferentially.

ip-subnet-vlan: Matches VLANs based on IP subnets preferentially.

Description

Use **vlan precedence** to set the order of VLAN matching.

Use **undo vlan precedence** to restore the default.

By default, VLANs are matched based on single MAC addresses preferentially.

This command only applies to VLANs based on a single MAC address and IP subnet-based VLANs.

If both the MAC-based VLAN function and the IP subnet-based VLAN function are created on a port, MAC address-to-VLAN entries are matched preferentially, and the remaining VLAN entries (VLAN entries based on a single MAC address and IP subnet-based VLANs) are matched as configured by the **vlan precedence** command.

Examples

Configure matching VLANs based on single MAC addresses preferentially on GigabitEthernet 1/0/1.

174

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] vlan precedence mac-vlan
```

Protocol-based VLAN configuration commands

display protocol-vlan interface

Syntax

display protocol-vlan interface { *interface-type interface-number1* [**to** *interface-type interface-number2*] | **all** } [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

2: System level

Parameters

interface-type interface-number1: Specifies an interface by its type and number.

interface-type interface-number1 **to** *interface-type interface-number2*: Specifies an interface range.

all: Displays information about protocol-based VLANs on all ports.

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display protocol-vlan interface** to display information about protocol-based VLANs for the specified ports.

Examples

Display protocol-based VLAN information on GigabitEthernet 1/0/1.

```
[Sysname] display protocol-vlan interface gigabitethernet 1/0/1
 Interface: GigabitEthernet1/0/1
   VLAN ID    Protocol Index        Protocol Type
 =======================================================
      2            0                ipv6
      3            0                ipv4
```

Table 37 Command output

Field	Description
VLAN ID	ID of the protocol-based VLAN bound to the port
Protocol Index	Protocol template index

Field	Description
Protocol Type	Protocol type specified by the protocol template

display protocol-vlan vlan

Syntax

display protocol-vlan vlan { *vlan-id1* [**to** *vlan-id2*] | **all** } [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

2: System level

Parameters

vlan-id1: Specifies a protocol-based VLAN ID, in the range of 1 to 4094.

vlan-id1 **to** *vlan-id2*: Displays protocol-based VLAN information of a VLAN range from *vlan-id1* to *vlan-id2*. *vlan-id1* and *vlan-id2* represent VLAN IDs and each range from 1 to 4094. The *vlan-id2* argument cannot be smaller than the *vlan-id1* argument.

all: Displays information about all protocol-based VLANs.

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display protocol-vlan vlan** to display the protocols and protocol indexes configured on the specified VLANs.

Related commands: **display vlan**.

Examples

Display the protocols and protocol indexes configured on all protocol-based-VLANs.

```
<Sysname> display protocol-vlan vlan all
 VLAN ID:2
    Protocol Index        Protocol Type
 ====================================================
         0                ipv4
         3                ipv6
 VLAN ID:3
    Protocol Index        Protocol Type
 ====================================================
         0                ipv4
         1                ipv6
```

Table 38 Command output

Field	Description
VLAN ID	ID of the protocol-based VLAN bound to the port
Protocol Index	Protocol template index
Protocol Type	Protocol type specified by the protocol template

port hybrid protocol-vlan

Syntax

port hybrid protocol-vlan vlan *vlan-id* { *protocol-index* [**to** *protocol-end*] | **all** }

undo port hybrid protocol-vlan { **vlan** *vlan-id* { *protocol-index* [**to** *protocol-end*] | **all** } | **all** }

View

Layer 2 Ethernet interface view, port group view, Layer 2 aggregate interface view

Default level

2: System level

Parameters

vlan *vlan-id*: Specifies a VLAN ID, in the range of 1 to 4094.

protocol-index: Specifies a protocol index. The value can be specified by the users or assigned by the system automatically when the protocol-based VLAN is created. You can use the **display protocol-vlan vlan all** command to display the protocol indexes. The *protocol-index* argument ranges from 0 to 15.

to *protocol-end*: Specifies the end protocol index. The *protocol-end* argument must be greater than or equal to the beginning protocol index. The *protocol-end* argument is in the range of 0 to 15.

all: Specifies all protocols bound to *vlan-id*.

Description

Use **port hybrid protocol-vlan** to associate the hybrid ports with a protocol-based VLAN.

Use **undo port hybrid protocol-vlan** to remove the association.

The configuration made in Layer 2 Ethernet interface view applies only to the port.

The configuration made in port group view applies to all ports in the port group.

The configuration made in Layer 2 aggregate interface view applies to the aggregate interface and its aggregation member ports.

- If the system fails to apply the configuration to the aggregate interface, it stops applying the configuration to aggregation member ports.
- If the system fails to apply the configuration to an aggregation member port, it skips the port and moves to the next member port.

Before you use this command, make the following configurations:

- Create a VLAN and associate it with specified protocols.
- Configure the link type as hybrid.
- Configure the port to allow the protocol-based VLAN to pass through.

Related commands: **display protocol-vlan interface**.

Examples

Associate the hybrid port GigabitEthernet 1/0/1 with protocol 0 (IPv4) in VLAN 2.

```
<Sysname> system-view
[Sysname] vlan 2
[Sysname-vlan2] protocol-vlan ipv4
[Sysname-vlan2] quit
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] port link-type hybrid
[Sysname-GigabitEthernet1/0/1] port hybrid vlan 2 untagged
 Please wait... Done
[Sysname-GigabitEthernet1/0/1] port hybrid protocol-vlan vlan 2 0
```

Associate the hybrid Layer 2 aggregate interface Bridge-Aggregation 1 with protocol 0 in VLAN 2.

```
<Sysname> system-view
[Sysname] vlan 2
[Sysname-vlan2] protocol-vlan ipv4
[Sysname-vlan2] quit
[Sysname] interface bridge-aggregation 1
[Sysname-Bridge-Aggregation1] port link-type hybrid
[Sysname-Bridge-Aggregation1] port hybrid vlan 2 untagged
 Please wait... Done
 Configuring GigabitEthernet1/0/1... Done.
 Configuring GigabitEthernet1/0/2... Done.
 Configuring GigabitEthernet1/0/3... Done.
[Sysname-Bridge-Aggregation1] port hybrid protocol-vlan vlan 2 0
```

The output shows that GigabitEthernet 1/0/1, GigabitEthernet 1/0/2, and GigabitEthernet 1/0/3 are the member ports of the aggregation group corresponding to Bridge-Aggregation 1.

protocol-vlan

Syntax

protocol-vlan [*protocol-index*] { **at** | **ipv4** | **ipv6** | **ipx** { **ethernetii** | **llc** | **raw** | **snap** } | **mode** { **ethernetii etype** *etype-id* | **llc** { **dsap** *dsap-id* [**ssap** *ssap-id*] | **ssap** *ssap-id* } | **snap etype** *etype-id* } }

undo protocol-vlan { *protocol-index* [**to** *protocol-end*] | **all** }

View

VLAN view

Default level

2: System level

Parameters

at: Specifies the AppleTalk based VLAN.

ipv4: Specifies the IPv4 based VLAN.

ipv6: Specifies the IPv6 based VLAN.

ipx: Specifies the IPX based VLAN. The keywords **ethernetii**, **llc**, **raw**, and **snap** are encapsulation formats for IPX.

mode: Configures a user-defined protocol template for the VLAN, which could also have the following encapsulation formats: **ethernetii**, **llc**, and **snap**.

ethernetii etype *etype-id*: Matches Ethernet II encapsulation format and the corresponding protocol type values. The *etype-id* argument is the protocol type ID of inbound packets, in the range of 0x0600 to 0xFFFF (excluding 0x0800, 0x809B, 0x8137, and 0x86DD).

llc: Matches the **llc** encapsulation format.

dsap *dsap-id*: Specifies the destination service access point, in the range of 0x00 to 0xFF.

ssap *ssap-id*: Specifies the source service access point, in the range of 0x00 to 0xFF.

snap etype *etype-id*: Matches SNAP encapsulation format and the corresponding protocol type values. The *etype-id* argument is the Ethernet type of inbound packets, in the range of 0x0600 to 0xFFFF (excluding 0x8137).

protocol-index: Specifies a protocol template index, in the range of 0 to 15. The system will automatically assign an index if this parameter is not specified.

to *protocol-end*: Specifies the end protocol index, in the range of 0 to 15. The *protocol-end* argument must be greater than or equal to the *protocol-index* argument.

all: Removes all the protocols bound to the VLAN.

Description

Use **protocol-vlan** to configure the VLAN as a protocol based VLAN and configure the protocol template for the VLAN.

Use **undo protocol-vlan** to remove the configured protocol template.

By default, no VLAN is bound to any protocol template.

When you use the **mode** keyword to configure a user-defined protocol template, do not set *etype-id* in **ethernetii etype** *etype-id* to 0x0800, 0x809B, 0x8137, or 0x86DD. Otherwise, the encapsulation format of the matching packets will be the same as that of the IPv4, AppleTalk, IPX, and IPv6 packets, respectively.

Do not configure both the *dsap-id* and *ssap-id* arguments in the **protocol-vlan** command as 0xE0 or 0xFF when you configure the user-defined template for **llc** encapsulation. Otherwise, the encapsulation format of the matching packets will be the same as that of the **ipx llc** or **ipx raw** packets, respectively. When either of the *dsap-id* and *ssap-id* arguments is configured, the system assigns 0XAA to the other argument.

When you use the **mode** keyword to configure a user-defined protocol template, do not set *etype-id* in **snap etype** *etype-id* to 0x8137. Otherwise, the template format will be the same as that of the IPX protocol. You can set *etype-id* to 0x0800, 0x809B, or 0x86DD, corresponding to IPv4, AppleTalk, and IPv6, respectively.

Related commands: **display protocol-vlan vlan**.

Examples

⚠ CAUTION:

IP uses ARP for address resolution in Ethernet. To prevent communication failure, configure the IP and ARP templates in the same VLAN and associate them with the same port.

Configure VLAN 3 as an IPv4 based VLAN.

```
<Sysname> system-view
```

```
[Sysname] vlan 3
[Sysname-vlan3] protocol-vlan ipv4
```

Create an ARP protocol template for VLAN 3 (ARP code is 0x0806) to make VLAN 3 transmit ARP packets.

- To use Ethernet encapsulation, use this command:

```
[Sysname-vlan3] protocol-vlan mode ethernetii etype 0806
```

- To use 802.3 encapsulation, use this command:

```
[Sysname-vlan3] protocol-vlan mode snap etype 0806
```

IP subnet-based VLAN configuration commands

display ip-subnet-vlan interface

Syntax

display ip-subnet-vlan interface { *interface-type interface-number1* [**to** *interface-type interface-number2* | **all** } [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

2: System level

Parameters

interface-type interface-number1: Specifies an interface by its type and number.

interface-type interface-number1 **to** *interface-type interface-number2*: Specifies an interface range. *interface-number2* must be no smaller than *interface-number1*.

all: Displays IP subnet information about all the ports with IP subnet-based VLAN configured.

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display ip-subnet-vlan interface** to display IP subnet-based VLANs and IP subnet indexes on the specified ports.

Examples

Display IP subnet-based VLANs and IP subnet indexes on GigabitEthernet 1/0/1.

```
<Sysname> system-view
[Sysname] display ip-subnet-vlan interface gigabitethernet 1/0/1
Interface: GigabitEthernet1/0/1
  VLAN ID    Subnet-Index    IP ADDRESS        NET MASK
  =======================================================
```

```
    3            0               192.168.1.0    255.255.255.0
```

Table 39 Command output

Field	Description
Subnet-Index	Index of the IP subnet
IP ADDRESS	IP address of the subnet (either an IP address or a network address)
NET MASK	Mask of the IP subnet

display ip-subnet-vlan vlan

Syntax

display ip-subnet-vlan vlan { *vlan-id1* [**to** *vlan-id2*] | **all** } [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

2: System level

Parameters

vlan-id1: Specifies a VLAN ID, in the range of 1 to 4094.

vlan-id1 **to** *vlan-id2*: Specifies a VLAN range from *vlan-id1* to *vlan-id2*, where *vlan-id1* and *vlan-id2* represent VLAN IDs and each range from 1 to 4094. The *vlan-id2* argument must be no smaller than the *vlan-id1* argument.

all: Specifies all the VLANs.

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display ip-subnet-vlan vlan** to display the IP subnet-based VLAN information and IP subnet indexes on the specified VLANs.

Related commands: **display vlan**.

Examples

Display the IP subnet information and IP subnet indexes for all VLANs.
```
<Sysname> display ip-subnet-vlan vlan all
VLAN ID:  3
 Subnet Index      IP Address      Subnet Mask
 =================================================
      0           192.168.1.0    255.255.255.0
```

Table 40 Command output

Field	Description
Subnet Index	IP subnet index.
IP Address	IP address of the subnet. It can be an IP address or a network address.
Subnet Mask	Mask of the IP subnet.

ip-subnet-vlan

Syntax

ip-subnet-vlan [*ip-subnet-index*] **ip** *ip-address* [*mask*]

undo ip-subnet-vlan { *ip-subnet-index* [**to** *ip-subnet-end*] | **all** }

View

VLAN view

Default level

2: System level

Parameters

ip-subnet-index: Specifies a beginning IP subnet index, in the range of 0 to 11. The value can be configured by users, or automatically numbered by the system, based on the order in which the IP subnets or IP addresses are associated with the VLAN.

ip *ip-address* [*mask*]: Specifies the source IP address or network address based on which the subnet-based VLANs are classified, in dotted decimal notation. The *mask* argument is the subnet mask of the source IP address or network address, in dotted decimal notation with a default value of 255.255.255.0.

to: Specifies an IP subnet index range.

ip-subnet-end: Specifies an end IP subnet index, in the range of 0 to 11. The value must be greater than or equal to the beginning IP subnet index.

all: Removes all the associations between VLANs and IP subnets or IP addresses.

Description

Use **ip-subnet-vlan** to associate the VLAN with a specified IP subnet or IP address.

Use **undo ip-subnet-vlan** to remove the association.

The IP subnet or IP address cannot be a multicast network segment or a multicast address.

Related commands: **display ip-subnet-vlan vlan**.

Examples

Configure VLAN 3 as an IP subnet-based VLAN and associate it with the 192.168.1.0/24 network segment.

```
<Sysname> system-view
[Sysname] vlan 3
[Sysname-vlan3] ip-subnet-vlan ip 192.168.1.0 255.255.255.0
```

port hybrid ip-subnet-vlan

Syntax

port hybrid ip-subnet-vlan vlan *vlan-id*

undo port hybrid ip-subnet-vlan { **vlan** *vlan-id* | **all** }

View

Layer 2 Ethernet interface view, port group view, Layer 2 aggregate interface view

Default level

2: System level

Parameters

vlan *vlan-id*: Specifies a VLAN ID, in the range of 1 to 4094.

all: Specifies all VLANs.

Description

Use **port hybrid ip-subnet-vlan** to associate the Ethernet port with the specified IP subnet-based VLAN.

Use **undo port hybrid ip-subnet-vlan** to remove the association.

On an Ethernet port associated with an IP subnet-based VLAN, if the source IP address of a received untagged packet belongs to the corresponding IP subnet, the port tags the packet with the corresponding VLAN tag.

The configuration made in Layer 2 Ethernet interface view applies only to the port.

The configuration made in port group view applies to all ports in the port group.

The configuration made in Layer 2 aggregate interface view applies to the aggregate interface and its aggregation member ports.

- If the system fails to apply the configuration to the aggregate interface, it stops applying the configuration to aggregation member ports.
- If the system fails to apply the configuration to an aggregation member port, it skips the port and moves to the next member port.

Only hybrid ports support this feature. Before you use this command, assign the port to the IP subnet-based VLAN you want to associate with.

Related commands: **display ip-subnet-vlan interface**.

Examples

Associate GigabitEthernet 1/0/1 with the IP subnet-based VLAN 3.

```
<Sysname> system-view
[Sysname] vlan 3
[Sysname-vlan3] ip-subnet-vlan ip 192.168.1.0 255.255.255.0
[Sysname-vlan3] quit
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] port link-type hybrid
[Sysname-GigabitEthernet1/0/1] port hybrid vlan 3 untagged
 Please wait... Done.
[Sysname-GigabitEthernet1/0/1] port hybrid ip-subnet-vlan vlan 3
```

Associate the hybrid Layer 2 aggregate interface Bridge-Aggregation 1 with the IP subnet-based VLAN 3.

```
<Sysname> system-view
[Sysname] vlan 3
[Sysname-vlan3] ip-subnet-vlan ip 192.168.1.0 255.255.255.0
[Sysname-vlan3] quit
[Sysname] interface bridge-aggregation 1
[Sysname-Bridge-Aggregation1] port link-type hybrid
[Sysname-Bridge-Aggregation1] port hybrid vlan 3 untagged
 Please wait... Done
 Configuring GigabitEthernet1/0/1... Done.
 Configuring GigabitEthernet1/0/2... Done.
 Configuring GigabitEthernet1/0/3... Done.
[Sysname-Bridge-Aggregation1] port hybrid ip-subnet-vlan vlan 3
```

The output shows that GigabitEthernet 1/0/1, GigabitEthernet 1/0/2, and GigabitEthernet 1/0/3 are the member ports of the aggregation group corresponding to Bridge-Aggregation 1.

Isolate-user-VLAN configuration commands

display isolate-user-vlan

display isolate-user-vlan [*isolate-user-vlan-id*] [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

1: Monitor level

Parameters

isolate-user-vlan-id: Specifies an isolate-user-VLAN ID, in the range of 1 to 4094.

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display isolate-user-vlan** to display the mapping between an isolate-user-VLAN and secondary VLANs.

Related commands: **isolate-user-vlan** and **isolate-user-vlan enable**.

Examples

Display the mapping between an isolate-user-VLAN and secondary VLANs.

```
<Sysname> display isolate-user-vlan
 Isolate-user-VLAN VLAN ID : 2
 Secondary VLAN ID : 3 4

 VLAN ID: 2
 VLAN Type: static
 Isolate-user-VLAN type : isolate-user-VLAN
 Route Interface: configured
 IPv4 address: 1.1.1.1
 IPv4 subnet mask: 255.255.255.0
 IPv6 global unicast address(es):
    2001::1, subnet is 2001::/64 [TENTATIVE]
 Description: VLAN 0002
 Name: VLAN 0002
 Tagged    Ports: none
```

```
Untagged Ports:
    GigabitEthernet1/0/2        GigabitEthernet1/0/3        GigabitEthernet1/0/4

VLAN ID: 3
VLAN Type: static
Isolate-user-VLAN type : secondary
Route Interface: not configured
Description: VLAN 0003
Name: VLAN 0003
Tagged   Ports: none
Untagged Ports:
    GigabitEthernet1/0/2        GigabitEthernet1/0/3

VLAN ID: 4
VLAN Type: static
Isolate-user-VLAN type : secondary
Route Interface: not configured
Description: VLAN 0004
Name: VLAN 0004
Tagged   Ports: none
Untagged Ports:
  GigabitEthernet1/0/2        GigabitEthernet1/0/4
```

Table 41 Command output

Field	Description
Isolate-user-VLAN VLAN ID	Isolate-user-VLAN ID.
Secondary VLAN ID	Secondary VLAN ID.
VLAN Type	VLAN type (static or dynamic).
Isolate-user-VLAN type	Current VLAN type (isolate-user-VLAN or secondary VLAN).
Route Interface	Indicates whether a VLAN interface is configured for the VLAN.
IPv4 address	IPv4 address of the VLAN interface (available only when an IPv4 address is configured for the VLAN interface).
IPv4 subnet mask	Subnet mask of the IPv4 address (available only when an IPv4 address is configured for the VLAN interface).
IPv6 global unicast address(es)	Global unicast IPv6 address of the VLAN interface (available only when an IPv6 address is configured for the VLAN interface).
Tagged Ports	Ports through which packets of this VLAN are sent tagged.
Untagged Ports	Ports through which packets of this VLAN are sent untagged.

isolate-user-vlan

Syntax

isolate-user-vlan *isolate-user-vlan-id* **secondary** *secondary-vlan-id1* [**to** *secondary-vlan-id2*]

undo isolate-user-vlan *isolate-user-vlan-id* [**secondary** *secondary-vlan-id1* [**to** *secondary-vlan-id2*]]

View

System view

Default level

2: System level

Parameters

isolate-user-vlan-id: Specifies an isolate-user-VLAN ID, in the range of 1 to 4094. Do not specify VLAN 1 for this argument.

secondary *secondary-vlan-id1* [**to** *secondary-vlan-id2*]: Specifies a secondary VLAN ID or a secondary VLAN ID range. The *secondary-vlan-id1* and *secondary-vlan-id2* arguments represent secondary VLAN IDs and each range from 1 to 4094. The *secondary-vlan-id2* argument cannot be smaller than the *secondary-vlan-id1* argument. Do not specify VLAN 1 for the *secondary-vlan-id1* or *secondary-vlan-id2* argument.

Description

Use **isolate-user-vlan** to associate an isolate-user-VLAN with the specified secondary VLANs.

Use **undo isolate-user-vlan** to remove the association.

By default, an isolate-user-VLAN is not associated with any secondary VLAN. .

The **undo isolate-user-vlan** command without the **secondary** *secondary-vlan-id1* [**to** *secondary-vlan-id2*] option specified removes the association between the specified isolate-user-VLAN and all its secondary VLANs.

The **undo isolate-user-vlan** command with the **secondary** *secondary-vlan-id* parameter specified only removes the association between the specified isolate-user-VLAN and the specified secondary VLANs.

Do not configure the default VLAN (VLAN 1) as a secondary VLAN or isolate-user-VLAN.

Related commands: **display isolate-user-vlan**.

Examples

Associate isolate-user-VLAN 2 with secondary VLANs VLAN 3 and VLAN 4.

```
<Sysname> system-view
[Sysname] vlan 2
[Sysname-vlan2] isolate-user-vlan enable
[Sysname-vlan2] port gigabitethernet 1/0/2
[Sysname-vlan2] vlan 3
[Sysname-vlan3] port gigabitethernet 1/0/3
[Sysname-vlan3] vlan 4
[Sysname-vlan4] port gigabitethernet 1/0/4
[Sysname-vlan4] quit
[Sysname] isolate-user-vlan 2 secondary 3 to 4
```

isolate-user-vlan enable

Syntax

isolate-user-vlan enable

undo isolate-user-vlan enable

View

VLAN view

Default level

2: System level

Parameters

None

Description

Use **isolate-user-vlan enable** to configure the VLAN as an isolate-user-VLAN.

Use **undo isolate-user-vlan enable** to remove the isolate-user-VLAN configuration for the VLAN.

By default, no VLAN is an isolate-user-VLAN.

An isolate-user-VLAN may include multiple ports, including the one connected to the upstream device.

Do not configure the default VLAN (VLAN 1) as a secondary VLAN or isolate-user-VLAN.

Related commands: **display isolate-user-vlan**.

Examples

Configure VLAN 5 as an isolate-user-VLAN.

```
<Sysname> system-view
[Sysname] vlan 5
[Sysname-vlan5] isolate-user-vlan enable
```

isolated-vlan enable

Syntax

isolated-vlan enable

undo isolated-vlan enable

View

VLAN view

Default level

2: System level

Parameters

None

Description

Use **isolated-vlan enable** to configure Layer 2 isolation between ports in the same secondary VLAN.

Use **undo isolated-vlan enable** to restore the default.

By default, ports in the same secondary VLAN can communicate at Layer 2.

You cannot configure Layer 2 isolation between ports in an isolate-user-VLAN.

Layer 2 isolation configured with the **isolated-vlan enable** command takes effect only when each port in the secondary VLAN is configured to operate in host mode and the secondary VLAN is associated with an isolate-user-VLAN.

188

After you configure the **isolated-vlan enable** command in VLAN view, you cannot assign any port in the VLAN to an isolation group.

Layer 2 isolation configured with the **isolated-vlan enable** command takes effect only after the secondary VLAN is associated with an isolate-user-VLAN.

Related commands: **isolate-user-vlan**.

Examples

Configure Layer 2 isolation between ports in secondary VLAN 4, where GigabitEthernet 1/0/1 is the uplink port and GigabitEthernet 1/0/2 and GigabitEthernet 1/0/3 are the downlink ports.

```
<Sysname> system-view
[Sysname] vlan 2
[Sysname-vlan2] isolate-user-vlan enable
[Sysname-vlan2] quit
[Sysname] vlan 4
[Sysname-vlan4] quit
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] port isolate-user-vlan 2 promiscuous
[Sysname-GigabitEthernet1/0/1] quit
[Sysname] interface gigabitethernet 1/0/2
[Sysname-GigabitEthernet1/0/2] port access vlan 4
[Sysname-GigabitEthernet1/0/2] port isolate-user-vlan host
[Sysname-GigabitEthernet1/0/2] quit
[Sysname] interface gigabitethernet 1/0/3
[Sysname-GigabitEthernet1/0/3] port access vlan 4
[Sysname-GigabitEthernet1/0/3] port isolate-user-vlan host
[Sysname-GigabitEthernet1/0/3] quit
[Sysname] isolate-user-vlan 2 secondary 4
[Sysname] vlan 4
[Sysname-vlan4] isolated-vlan enable
```

port isolate-user-vlan promiscuous

Syntax

port isolate-user-vlan *vlan-id* **promiscuous**

undo port isolate-user-vlan

View

Layer 2 Ethernet interface view, Layer 2 aggregate interface view

Default level

2: System level

Parameters

vlan-id: Specifies a VLAN ID, in the range of 2 to 4094.

Description

Use **port isolate-user-vlan promiscuous** to configure a port to operate in promiscuous mode in a VLAN.

Use **undo port isolate-user-vlan** to restore the default.

By default, a port does not operate in promiscuous mode or host mode in a VLAN.

HP recommends assigning access or hybrid ports to an isolate-user-VLAN.

When you use the **port isolate-user-vlan** *vlan-id* **promiscuous** command on a port that is operating in promiscuous mode, the device automatically executes the **undo port isolate-user-vlan** command to cancel the promiscuous mode of the port first.

If you specify an isolate-user-VLAN in the command, the switch automatically assigns the target port to both the specified VLAN and all secondary VLANs associated with it. If you specify a non-isolate-user-VLAN in the command, the switch assigns the target port only to the specified VLAN. However, when the isolate-user-VLAN setting is configured for that VLAN, the switch immediately assigns the port to all secondary VLANs associated with the isolate-user-VLAN.

In automatic assignment to the isolate-user-VLAN and secondary VLANs for an access port, the switch also changes the link type of the port to hybrid, and sets the isolate-user-VLAN as the PVID of the port. If the isolate-user-VLAN setting is configured later than the execution of the **port isolate-user-vlan** *vlan-id* **promiscuous** command, the link type and PVID do not change until the isolate-user-VLAN setting is configured on the VLAN specified in the command.

The link type and PVID never change on a trunk port or hybrid port in the automatic VLAN assignment process.

After the port link type changes, the switch keeps the member attribute of the hybrid port unchanged in the VLANs where it is already a tagged member, and automatically assigns the port to the remaining VLANs as an untagged member.

When you execute the **undo port isolate-user-vlan** command, follow these guidelines:

- The command cancels the promiscuous mode of a port. It does not remove an access port from the specific VLAN, but removes a trunk or hybrid port from the specific VLAN.
- If the specific VLAN has been configured as an isolate-user-VLAN and associated with secondary VLANs, the command does not remove the port from the secondary VLANs.

Examples

Configure access port GigabitEthernet 1/0/1 to operate in promiscuous mode in isolate-user-VLAN 2, which is associated with secondary VLAN 20, and then cancel the configuration.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] display this
#
interface GigabitEthernet1/0/1
 port link-mode bridge
#
return
[Sysname-GigabitEthernet1/0/1] port isolate-user-vlan 2 promiscuous
[Sysname-GigabitEthernet1/0/1] display this
#
interface GigabitEthernet1/0/1
 port link-mode bridge
 port isolate-user-vlan 2 promiscuous
 port link-type hybrid
 undo port hybrid vlan 1
 port hybrid vlan 2 20 untagged
 port hybrid pvid vlan 2
```

```
#
return
[Sysname-GigabitEthernet1/0/1] undo port isolate-user-vlan
[Sysname-GigabitEthernet1/0/1] display this
#
interface GigabitEthernet1/0/1
 port link-mode bridge
 port link-type hybrid
 undo port hybrid vlan 1
 port hybrid vlan 20 untagged
 port hybrid pvid vlan 2
#
return
```

Assign access port GigabitEthernet 1/0/1 to VLAN 10, which is not an isolate-user-VLAN, configure the port to operate in promiscuous mode in VLAN 10, and then cancel the configuration.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] display this
#
interface GigabitEthernet1/0/1
 port link-mode bridge
#
return
[Sysname-GigabitEthernet1/0/1] port isolate-user-vlan 10 promiscuous
[Sysname-GigabitEthernet1/0/1] display this
#
interface GigabitEthernet1/0/1
 port link-mode bridge
 port isolate-user-vlan 10 promiscuous
 port access vlan 10
#
return
[Sysname-GigabitEthernet1/0/1] undo port isolate-user-vlan
[Sysname-GigabitEthernet1/0/1] display this
#
interface GigabitEthernet1/0/1
 port link-mode bridge
 port access vlan 10
#
return
```

port isolate-user-vlan host

Syntax

port isolate-user-vlan host

undo port isolate-user-vlan

View

Layer 2 Ethernet interface view, Layer 2 aggregate interface view

Default level

2: System level

Parameters

None

Description

Use **port isolate-user-vlan host** to configure a port to operate in host mode.

Use **undo port isolate-user-vlan** to restore the default.

By default, a port does not operate in promiscuous mode or host mode.

You cannot assign trunk ports to a secondary VLAN.

If the port has been assigned to a secondary VLAN, the switch automatically assigns the target port to the isolate-user-VLAN associated with the secondary VLAN. If the port has not been assigned to a secondary VLAN, the switch immediately assigns the target port to the isolate-user-VLAN associated with the secondary VLAN after the port is assigned to a secondary VLAN.

In automatic assignment to the isolate-user-VLAN associated with the secondary VLAN for an access port, the switch also changes the link type of the port to hybrid, and sets the secondary VLAN as the PVID of the port.

The link type and PVID never change on a trunk port or hybrid port in the automatic VLAN assignment process.

After the port link type changes, the switch keeps the member attribute of the hybrid port unchanged when it is already a tagged member of the isolate-user-VLAN, and otherwise automatically assigns the port to the isolate-user-VLAN as an untagged member.

When you execute the **undo port isolate-user-vlan** command, the command cancels the host mode of a port. It does not remove the port from the isolate-user-VLAN.

Examples

\# Configure access port GigabitEthernet 1/0/1 to operate in host mode and assign the port to secondary VLAN 20, which is associated with isolate-user-VLAN 2.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] port isolate-user-vlan host
[Sysname-GigabitEthernet1/0/1] display this
#
interface GigabitEthernet1/0/1
 port link-mode bridge
 port isolate-user-vlan host
#
return
[Sysname-GigabitEthernet1/0/1] port access vlan 20
[Sysname-GigabitEthernet1/0/1] display this
#
interface GigabitEthernet1/0/1
 port link-mode bridge
```

```
 port isolate-user-vlan host
 port link-type hybrid
 undo port hybrid vlan 1
 port hybrid vlan 2 20 untagged
 port hybrid pvid vlan 20
#
return
```

Voice VLAN configuration commands

display voice vlan oui

Syntax

display voice vlan oui [| { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

1: Monitor level

Parameters

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display voice vlan oui** to display the supported organizationally unique identifier (OUI) addresses, the OUI address masks, and the description strings.

OUI addresses are used to determine whether a received packet is a voice packet. They are the results of the AND operation of the two arguments *mac-address* and *oui-mask* in the **voice vlan mac-address** command.

Related commands: **voice vlan mac-address**.

Examples

Display the supported OUI addresses, and their masks and descriptions.

```
<Sysname> display voice vlan oui
Oui Address     Mask            Description
0001-e300-0000  ffff-ff00-0000  Siemens phone
0003-6b00-0000  ffff-ff00-0000  Cisco phone
0004-0d00-0000  ffff-ff00-0000  Avaya phone
00d0-1e00-0000  ffff-ff00-0000  Pingtel phone
0060-b900-0000  ffff-ff00-0000  Philips/NEC phone
00e0-7500-0000  ffff-ff00-0000  Polycom phone
00e0-bb00-0000  ffff-ff00-0000  3com phone
```

Table 42 Command output

Field	Description
Oui Address	OUI addresses supported

Field	Description
Mask	Masks of the OUI addresses supported
Description	Description strings of the OUI addresses supported

display voice vlan state

Syntax

display voice vlan state [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

1: Monitor level

Parameters

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display voice vlan state** to display voice VLAN configuration.

Related commands: **voice vlan enable**, **voice vlan qos**, and **voice vlan qos trust**.

Examples

Display voice VLAN configurations.

```
<Sysname> display voice vlan state
Maximum of Voice VLANs: 8
 Current Voice VLANs: 1
 Voice VLAN security mode: Security
 Voice VLAN aging time: 1440 minutes
 Voice VLAN enabled port and its mode:
 PORT                    VLAN      MODE      COS       DSCP
 ----------------------------------------------------------------
 GigabitEthernet1/0/11   111       AUTO      6         46
```

Table 43 Command output

Field	Description
Maximum of Voice VLANs	Maximum number of voice VLANs supported by the system.
Current Voice VLANs	Number of existing voice VLANs.

Field	Description
Voice VLAN security mode	Security mode of the voice VLAN: • **Security**—Security mode. • **Normal**—Normal mode.
Voice VLAN aging time	Aging time of the voice VLAN.
Voice VLAN enabled port and its mode	Voice VLAN-enabled port and its voice VLAN assignment mode.
PORT	Voice VLAN-enabled port name.
VLAN	ID of the voice VLAN enabled on the port.
MODE	Voice VLAN assignment mode of the port, manual or automatic.
COS	Class of Service.
DSCP	Differentiated Services Codepoint Priority.

lldp voice-vlan

Syntax

lldp voice-vlan *vlan-id*

undo lldp voice-vlan

View

Layer 2 Ethernet interface view, port group view

Default level

2: System level

Parameters

vlan-id: Specifies a voice VLAN by its ID, which ranges from 1 to 4094.

Description

Use **lldp voice-vlan** *vlan-id* to configure a port to advertise a specific voice VLAN ID to the connected IP phone through LLDP. If CDP compatibility is enabled, LLDP also includes the specified voice VLAN ID in the CDP packets sent to the IP phone.

Use **undo lldp voice-vlan** to restore the default.

By default, if a voice VLAN is configured on an LLDP-enabled port, LLDP advertises this voice VLAN to the IP phone connected to the port.

Examples

Configure port GigabitEthernet 1/0/1 to advertise voice VLAN 4094.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] lldp voice-vlan 4094
```

voice vlan aging

Syntax

voice vlan aging *minutes*

undo voice vlan aging

View

System view

Default level

2: System level

Parameters

minutes: Sets the voice VLAN aging time, in the range of 5 to 43200 minutes.

Description

Use **voice vlan aging** to configure the voice VLAN aging time.

Use **undo voice vlan aging** to restore the default.

By default, the voice VLAN aging time is 1440 minutes.

When a port in automatic voice VLAN assignment mode receives a voice packet, the system decides whether to assign the port to the voice VLAN based on the source MAC address of the voice packet. Upon assigning the port to the voice VLAN, the system starts the aging timer. If no voice packets are received on the port until the aging time expires, the system automatically removes the port from the voice VLAN. This aging time applies only to the ports in automatic voice VLAN assignment mode.

Related commands: **display voice vlan state**.

Examples

Configure the voice VLAN aging time as 100 minutes.

```
<Sysname> system-view
[Sysname] voice vlan aging 100
```

voice vlan enable

Syntax

voice vlan *vlan-id* **enable**

undo voice vlan [*vlan-id*] **enable**

View

Layer 2 Ethernet interface view

Default level

2: System level

Parameters

vlan-id: Specifies a VLAN ID, in the range of 2 to 4096.

Description

Use **voice vlan enable** to enable the voice VLAN feature and configure a VLAN as the voice VLAN for the Ethernet port.

Use **undo voice vlan enable** to disable the voice VLAN feature on an Ethernet port.

By default, the voice VLAN feature is disabled on ports.

Enable the voice VLAN feature on a hybrid or trunk port operating in automatic voice VLAN assignment mode, but not on an access port operating in automatic voice VLAN assignment mode.

Examples

Enable the voice VLAN feature on GigabitEthernet 1/0/1.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] voice vlan 2 enable
```

voice vlan mac-address

Syntax

voice vlan mac-address *mac-address* **mask** *oui-mask* [**description** *text*]

undo voice vlan mac-address *oui*

View

System view

Default level

2: System level

Parameters

mac-address: Specifies a source MAC address of voice traffic, in the format of H-H-H. For example, 1234-1234-1234.

mask *oui-mask*: Specifies the valid length of the OUI address by a mask in the format of H-H-H, formed by consecutive 1s and 0s. For example, FFFF-0000-0000. To filter the voice device of a specific vendor, set the mask to FFFF-FF00-0000.

description *text*: Specifies a string of 1 to 30 case-sensitive characters that describes the OUI address.

oui: Specifies the OUI address you want to remove, in the format of H-H-H. For example, 1234-1200-0000. An OUI address is the logic AND result of *mac-address* and *oui-mask*. An OUI address cannot be a broadcast address, a multicast address, or an all-zero address.

Description

Use **voice vlan mac-address** to allow packets carrying the specified OUI address to pass through.

Use **undo voice vlan mac-address** to prohibit packets carrying the specified OUI address from passing through.

Use **display voice vlan oui** to display the OUI addresses supported.

By default, the system is configured with the default OUI addresses. You can remove the default OUI addresses and then add recognizable OUI addresses manually.

The Switch Series supports up to 16 OUI addresses.

Table 44 Default OUI addresses

Number	OUI address	Vendor
1	0001-E300-0000	Siemens phone

Number	OUI address	Vendor
2	0003-6B00-0000	Cisco phone
3	0004-0D00-0000	Avaya phone
4	00D0-1E00-0000	Pingtel phone
5	0060-B900-0000	Philips/NEC phone
6	00E0-7500-0000	Polycom phone
7	00E0-BB00-0000	3Com phone

Related commands: **display voice vlan oui**.

Examples

Add a recognizable OUI address 1234-1200-0000 by specifying the MAC address as 1234-1234-1234 and the mask as fff-ff00-0000, and configure its description string as **PhoneA**.

```
<Sysname> system-view
[Sysname] voice vlan mac-address 1234-1234-1234 mask ffff-ff00-0000 description PhoneA
```

voice vlan mode auto

Syntax

voice vlan mode auto

undo voice vlan mode auto

View

Layer 2 Ethernet interface view

Default level

2: System level

Parameters

None

Description

Use **voice vlan mode auto** to configure the port to operate in automatic voice VLAN assignment mode.

Use **undo voice vlan mode auto** to configure the port to operate in manual voice VLAN assignment mode.

By default, a port operates in automatic voice VLAN assignment mode.

The voice VLAN modes of different ports are independent of one another.

To make voice VLAN take effect on a port which is enabled with voice VLAN and operates in manual voice VLAN assignment mode, assign the port to the voice VLAN manually.

Examples

Configure GigabitEthernet 1/0/1 to operate in manual voice VLAN assignment mode.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] undo voice vlan mode auto
```

voice vlan qos

Syntax

voice vlan qos *cos-value dscp-value*

undo voice vlan qos

View

Layer 2 Ethernet interface view

Default level

2: System level

Parameters

cos-value: Sets the CoS precedence value for voice VLAN traffic. The default value is 6.

dscp-value: Sets the DSCP value for voice VLAN traffic. The default value is 46.

Description

Use **voice vlan qos** to configure the interface to modify the CoS and DSCP values marked for incoming traffic of the voice VLAN into specified values.

Use **undo voice vlan qos** to restore the default.

By default, an interface modifies the CoS value and the DSCP value marked for voice VLAN traffic into 6 and 46, respectively.

Configure the QoS priority settings for voice VLAN traffic on an interface before you enable voice VLAN on the interface. If the configuration order is reversed, the priority settings will fail.

The **voice vlan qos** command and the **voice vlan qos trust** command can overwrite each other. When you execute the two commands on a port multiple times, the most recent one takes effect.

Related commands: **voice vlan qos trust**.

Examples

Configure interface GigabitEthernet 1/0/1 to modify the CoS value and the DSCP value marked for voice VLAN packets into 5 and 45, respectively.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] voice vlan qos 5 45
```

voice vlan qos trust

Syntax

voice vlan qos trust

undo voice vlan qos

View

Layer 2 Ethernet interface view

Default level

2: System level

Parameters

None

Description

Use **voice vlan qos trust** to configure the interface to trust the priority settings carried in incoming voice traffic. With this command configured, an interface keeps the CoS and DSCP values marked for incoming voice traffic unchanged.

Use **undo voice vlan qos** to restore the default.

By default, an interface modifies the CoS value and the DSCP value marked for voice VLAN traffic into 6 and 46, respectively.

Configure the QoS priority trust mode for voice VLAN traffic on an interface before enabling voice VLAN on the interface. If the configuration order is reversed, your priority trust setting will fail.

The **voice vlan qos** command and the **voice vlan qos trust** command can overwrite each other. After you execute the two commands on a port multiple times, the one that was last executed takes effect.

Related commands: **voice vlan qos**.

Examples

Configure interface GigabitEthernet 1/0/1 to trust the priority settings carried in incoming voice VLAN traffic.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] voice vlan qos trust
```

voice vlan security enable

Syntax

voice vlan security enable

undo voice vlan security enable

View

System view

Default level

2: System level

Parameters

None

Description

Use **voice vlan security enable** to enable the voice VLAN security mode.

Use **undo voice vlan security enable** to disable the voice VLAN security mode.

By default, the voice VLAN security mode is enabled.

When you enable the security mode for a voice VLAN, only voice traffic can be transmitted in the voice VLAN.

The device matches the source MAC addresses of the packets against the supported OUI addresses to determine whether they are voice traffic and filters all non-voice traffic, guaranteeing high priority and high quality for voice traffic.

When a voice VLAN operates in common mode, other data traffic is also transmitted in the voice VLAN.

Examples

Disable voice VLAN security mode.

```
<Sysname> system-view
[Sysname] undo voice vlan security enable
```

voice vlan track lldp

Syntax

voice vlan track lldp

undo voice vlan track lldp

View

System view

Default level

2: System level

Parameters

None

Description

Use **voice vlan track lldp** to enable LLDP to automatically discover IP phones.

Use **undo voice vlan track lldp** to disable LLDP from automatically discovering IP phones.

By default, LLDP is disabled from automatically discovering IP phones.

Examples

Enable the switch to automatically discover IP phones through LLDP.

```
<Sysname> system-view
[Sysname] voice vlan track lldp
```

GVRP configuration commands

display garp statistics

Syntax

display garp statistics [**interface** *interface-list*] [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

1: Monitor level

Parameters

interface *interface-list*: Displays the GARP statistics of one or multiple ports. You can specify up to 10 port lists.

- You can specify a single port in the form of *interface-type interface-number*.
- You can specify a port range in the form of *interface-type interface-number1* **to** *interface-type interface-number2*, where the end port number specified by *interface-number2* must be greater than the start port number specified by *interface-number1*.

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display garp statistics** to display the GARP statistics of the specified ports. If no ports are specified, this command displays the GARP statistics for all ports.

This command displays the statistics about GVRP PDUs received, transmitted, and dropped on GVRP-enabled ports. When the system is restarted or after you perform the **reset garp statistics** command, the existing packet statistics are cleared and the system starts to collect new GARP statistics. With the statistics, you can judge whether a GVRP-enabled port is operating properly.

- If the number of received and transmitted GVRP PDUs on the port is the same as the remote port, it indicates that the two ends are transmitting and receiving GVRP PDUs properly and no registration information is lost.
- If the port drops GVRP PDUs, you should check its registration mode. GVRP PDUs are likely to be dropped if the registration mode is fixed or forbidden, because dynamic VLANs cannot be registered in these two modes.

Related commands: **reset garp statistics**.

Examples

Display GARP statistics on ports GigabitEthernet 1/0/1 and GigabitEthernet 1/0/2.

```
<Sysname> display garp statistics interface gigabitethernet 1/0/1 to gigabitethernet 1/0/2

        GARP statistics on port GigabitEthernet1/0/1

        Number of GVRP Frames Received       : 5
        Number of GVRP Frames Transmitted    : 2
        Number of Frames Discarded           : 1


        GARP statistics on port GigabitEthernet1/0/2

        Number of GVRP Frames Received       : 3
        Number of GVRP Frames Transmitted    : 4
        Number of Frames Discarded           : 2
```

display garp timer

Syntax

display garp timer [**interface** *interface-list*] [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

1: Monitor level

Parameters

interface *interface-list*: Displays the GARP timer settings of one or multiple ports. You can specify up to 10 port lists.

- You can specify a single port in the form of *interface-type interface-number*.
- You can specify a port range in the form of *interface-type interface-number1* **to** *interface-type interface-number2*, where the end port number specified by *interface-number2* must be greater than the start port number specified by *interface-number1*.

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display garp timer** to display GARP timers on specific ports. If no ports are specified, this command displays the GARP timers on all ports.

Related commands: **garp timer hold**, **garp timer join**, **garp timer leave**, and **garp timer leaveall**.

Examples

Display GARP timers on port GigabitEthernet 1/0/1.

```
<Sysname> display garp timer interface gigabitethernet 1/0/1
        GARP timers on port GigabitEthernet1/0/1
```

```
Garp Join Time         : 20 centiseconds
Garp Leave Time        : 60 centiseconds
Garp LeaveAll Time     : 1000 centiseconds
Garp Hold Time         : 10 centiseconds
```

display gvrp local-vlan

Syntax

display gvrp local-vlan interface *interface-type interface-number* [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

0: Visit level

Parameters

interface *interface-type interface-number*: Specifies an interface by its type and number.

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display gvrp local-vlan** to display the local VLAN information maintained by GVRP on the specified port.

Examples

Display the local VLAN information maintained by GVRP on GigabitEthernet 1/0/1.
```
<Sysname> display gvrp local-vlan interface gigabitethernet 1/0/1
 Following VLANs exist in GVRP local database:
  1(default),2-500
```

display gvrp state

Syntax

display gvrp state interface *interface-type interface-number* **vlan** *vlan-id* [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

0: Visit level

Parameters

interface *interface-type interface-number*: Specifies an interface by its type and number.

vlan *vlan-id*: Specifies a VLAN ID, ranging from 1 to 4094.

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display gvrp state** to display GVRP state machines in a specified VLAN on a port.

Examples

Display GVRP state machines in VLAN 2 on port GigabitEthernet 1/0/1.

```
<Sysname> display gvrp state interface gigabitethernet 1/0/1 vlan 2
        GVRP state of VLAN 2 on port GigabitEthernet1/0/1

              Applicant state machine      : VP
              Registrar state machine      : MTR
```

Table 45 Command output

Field	Description
GVRP state of VLAN 2 on port GigabitEthernet1/0/1	Information about the GVRP state machines in VLAN 2 on port GigabitEthernet 1/0/1.
Applicant state machine	Applicant state machine handles attribute declarations. Its state can be VA, AA, QA, LA, VP, AP, QP, VO, AO, QO, LO, VON, AON, and QON. Each state consists of two or three letters with the following meanings: • The first letter indicates the state: V for Very anxious, A for Anxious, Q for Quiet, and L for Leaving. • The second letter indicates the membership state: A for Active member, P for Passive member, and O for Observer. • The third letter N (if any) stands for Non-participant. For example, VP indicates "Very anxious, Passive member".

Field	Description
Registrar state machine	Registrar state machine records the registration of attributes declared by other participants. Its state can be INN, LV, L3, L2, L1, MT, INR, LVR, L3R, L2R, L1R, MTR, INF, LVF, L3F, L2F, L1F, and MTF. Each state consists of two or three letters or numbers with the following meanings: • The first two letters or numbers indicate the state: IN stands for In; LV, L3, L2, and L1 all stand for Leaving, and L3, L2, L1 are three sub-states of LV; MT stands for Empty • The third letter indicates the registration mode: N (if any) for Normal registration, R for Registration fixed, and F for Registration forbidden. For example, MTR stands for "Empty, Registration fixed", indicating the fixed registration mode in Empty state.

display gvrp statistics

Syntax

display gvrp statistics [**interface** *interface-list*] [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

1: Monitor level

Parameters

interface *interface-list*: Displays the GVRP statistics of one or multiple Ethernet ports.

You can provide up to 10 Ethernet port lists, specified in the following ways:

• As an individual port in the form of *interface-type interface-number*

• As a port range in the form of *interface-type interface-number1* **to** *interface-type interface-number2*, where the end-port number specified by *interface-number2* must be greater than the start-port number specified by *interface-number1*

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display gvrp statistics** to display the GVRP statistics of the specified trunk ports. If no ports are specified, this command displays the GVRP statistics for all trunk ports.

Examples

Display GVRP statistics for trunk port GigabitEthernet 1/0/1.

```
<Sysname> display gvrp statistics interface gigabitethernet 1/0/1
```

```
        GVRP statistics on port GigabitEthernet1/0/1

              GVRP Status                     : Enabled
              GVRP Running                    : YES
              GVRP Failed Registrations       : 0
              GVRP Last Pdu Origin            : 0000-0000-0000
              GVRP Registration Type          : Normal
```

Table 46 Command output

Field	Description
GVRP Status	Indicates whether GVRP is enabled or disabled.
GVRP Running	Indicates whether GVRP is running.
GVRP Failed Registrations	Indicates the number of GVRP registration failures.
GVRP Last Pdu Origin	Indicates the source MAC address in the last GVRP PDU.
GVRP Registration Type	Indicates the GVRP registration mode (fixed, forbidden, or normal) on the port.

display gvrp status

Syntax

display gvrp status [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

1: Monitor level

Parameters

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display gvrp status** to display the global GVRP state.

Examples

Display the global GVRP state.
```
<Sysname> display gvrp status

        GVRP is enabled
```

display gvrp vlan-operation

Syntax

display gvrp vlan-operation interface *interface-type interface-number* [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

0: Visit level

Parameters

interface *interface-type interface-number*: Specifies an interface by its type and number.

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display gvrp vlan-operation** to display information about dynamic VLAN operations on a port.

Examples

Display information about dynamic VLAN operations on GigabitEthernet 1/0/1.

```
<Sysname> display gvrp vlan-operation interface gigabitethernet 1/0/1
        Dynamic VLAN operations on port GigabitEthernet1/0/1

            Operations of creating VLAN          :  2-100
            Operations of deleting VLAN          :  none
            Operations of adding VLAN to TRUNK   :  2-100
            Operations of deleting VLAN from TRUNK  :  none
```

garp timer hold

Syntax

garp timer hold *timer-value*

undo garp timer hold

View

Ethernet interface view, Layer-2 aggregate interface view, port group view

Default level

2: System level

Parameters

timer-value: Hold timer (in centiseconds), which must be a multiple of 5 and range from 10 (inclusive) to half the Join timer (inclusive).

Description

Use **garp timer hold** to set the GARP Hold timer for an Ethernet port, Layer-2 aggregate interface, or all ports in a port group.

Use **undo garp timer hold** to restore the default of the GARP Hold timer. This may fail if the default is beyond the valid value range for the Hold timer.

By default, the Hold timer is 10 centiseconds.

Related commands: **display garp timer** and **garp timer join**.

Examples

Set the GARP Hold timer to 15 centiseconds, assuming that the Join timer is 30 centiseconds.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] garp timer hold 15
```

garp timer join

Syntax

garp timer join *timer-value*

undo garp timer join

View

Ethernet interface view, Layer-2 aggregate interface view, port group view

Default level

2: System level

Parameters

timer-value: Join timer (in centiseconds), which must be a multiple of 5 and range from twice the Hold timer (inclusive) and half the Leave timer (inclusive).

Description

Use **garp timer join** to set the GARP Join timer for an Ethernet port, Layer-2 aggregate interface, or all ports in a port group.

Use **undo garp timer join** to restore the default of the GARP Join timer. This may fail if the default is beyond the valid value range for the Join timer.

By default, the Join timer is set to 20 centiseconds.

Related commands: **display garp timer**, **garp timer hold**, and **garp timer leave**.

Examples

Set the GARP Join timer to 25 centiseconds, assuming that both the Hold timer and the Leave timer are using the default.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] garp timer join 25
```

garp timer leave

Syntax

garp timer leave *timer-value*

undo garp timer leave

View

Ethernet interface view, Layer-2 aggregate interface view, port group view

Default level

2: System level

Parameters

timer-value: Leave timer (in centiseconds), which must be a multiple of 5 and range from twice the Join timer (exclusive) to the LeaveAll timer (exclusive).

Description

Use **garp timer leave** to set the GARP Leave timer for an Ethernet port, Layer-2 aggregate interface, or all ports in a port group.

Use **undo garp timer leave** to restore the default of the GARP Leave timer. This may fail if the default is beyond the valid value range for the Leave timer.

By default, the Leave timer is set to 60 centiseconds.

Related commands: **display garp timer**, **garp timer join**, and **garp timer leaveall**.

Examples

Set the GARP Leave timer to 100 centiseconds, assuming that both the Join timer and the LeaveAll timer are using the default.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] garp timer leave 100
```

garp timer leaveall

Syntax

garp timer leaveall *timer-value*

undo garp timer leaveall

View

System view

Default level

2: System level

Parameters

timer-value: Leaveall timer (in centiseconds), which must be a multiple of 5 and range from the maximum Leave timer on the device (exclusive) to 32765 (inclusive).

Description

Use **garp timer leaveall** to set the GARP LeaveAll timer.

Use **undo garp timer leaveall** to restore the default. This may fail if the default is beyond the valid value range for the LeaveAll timer.

By default, the LeaveAll timer is 1000 centiseconds.

> **NOTE:**
> To keep the dynamic VLANs learned through GVRP stable, do not set the LeaveAll timer smaller than its default value.

Related commands: **display garp timer** and **garp timer leave**.

Examples

Set the leaveall timer to 2000 centiseconds, assuming that the Leave timer on every port is set to 60 centiseconds.

```
<Sysname> system-view
[Sysname] garp timer leaveall 2000
```

gvrp

Syntax

gvrp

undo gvrp

View

System view, Ethernet interface view, Layer-2 aggregate interface view, port group view

Default level

2: System level

Parameters

None

Description

Use **gvrp** to enable GVRP.

Use **undo gvrp** to disable GVRP.

By default, GVRP is disabled.

Settings in system view take effect globally; settings in Ethernet view or Layer 2 aggregate interface take effect on the current interface; settings in port group view take effect on all ports in the port group.

To enable GVRP on a port, enable GVRP globally before you enable it on the port.

In interface view, you can use this command on trunk ports only.

You cannot change the link type of a GVRP-enabled trunk port.

Related commands: **display gvrp status**.

Examples

Enable GVRP globally.

```
<Sysname> system-view
[Sysname] gvrp
GVRP is enabled globally.
```

gvrp registration

Syntax

gvrp registration { **fixed** | **forbidden** | **normal** }

undo gvrp registration

View

Ethernet interface view, Layer-2 aggregate interface view, port group view

Default level

2: System level

Parameters

fixed: Sets the GVRP registration mode to fixed.

forbidden: Sets the GVRP registration mode to forbidden.

normal: Sets the GVRP registration mode to normal.

Description

Use **gvrp registration** to configure the GVRP registration mode.

Use **undo gvrp registration** to restore the default.

The default GVRP registration mode is normal.

Settings in system view take effect globally; settings in Ethernet view or Layer 2 aggregate interface take effect on the current interface; settings in port group view take effect on all ports in the port group.

This command is only available on trunk ports.

Related commands: **display garp statistics**.

Examples

Set the GVRP registration mode to fixed on port GigabitEthernet 1/0/1.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] port link-type trunk
[Sysname-GigabitEthernet1/0/1] gvrp registration fixed
```

reset garp statistics

Syntax

reset garp statistics [**interface** *interface-list*]

View

User view

Default level

2: System level

Parameters

interface *interface-list*: Clears the GARP statistics of one or multiple ports.

You can provide up to 10 port lists, specified in the following ways:

- As an individual port in the form of *interface-type interface-number*
- As a port range in the form of *interface-type interface-number1* **to** *interface-type interface-number2*, where the end-port number specified by *interface-number2* must be greater than the start port number specified by *interface-number1*.

Description

Use **reset garp statistics** to clear the GARP statistics on the specified ports. If no ports are specified, this command clears the GARP statistics on all ports.

The cleared statistics include the statistics about GVRP PDUs sent, received, and dropped.

Related commands: **display garp statistics**.

Examples

Clear the GARP statistics on all ports.

```
<Sysname> reset garp statistics
```

QinQ configuration commands

- Throughout this document, customer network VLANs (CVLANs), also called inner VLANs, refer to the VLANs that a customer uses on the private network; and service provider network VLANs (SVLANs), also called outer VLANs, refer to the VLANs that a service provider uses to carry VLAN tagged traffic for customers.
- Selective QinQ is achieved through QoS policies. For more information about QoS policy configuration commands, see *ACL and QoS Command Reference*.

qinq enable

Syntax

qinq enable

undo qinq enable

View

Layer 2 Ethernet interface view, Layer 2 aggregate interface view, port group view

Default level

2: System level

Parameters

None

Description

Use **qinq enable** to enable basic QinQ on the Ethernet ports.

Use **undo qinq enable** to disable basic QinQ on the Ethernet ports.

By default, basic QinQ is disabled on Ethernet ports.

A basic QinQ-enabled port tags received frames with its PVID tag.

Configured in Layer 2 Ethernet interface view, the command takes effect on the port only. Configured in Layer 2 aggregate interface view, the command takes effect on the Layer 2 aggregate interface and all the member ports in the aggregation group. Configured in port group view, the command takes effect on all ports in the port group.

Examples

Enable basic QinQ on GigabitEthernet 1/0/1.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] qinq enable
```

Enable basic QinQ on all ports in port group 1.

```
<Sysname> system-view
[Sysname] port-group manual 1
[Sysname-port-group-manual-1] group-member gigabitethernet 1/0/1 to gigabitethernet
1/0/6
[Sysname-port-group-manual-1] qinq enable
```

qinq ethernet-type

Syntax

qinq ethernet-type *hex-value*

undo qinq ethernet-type

View

System view

Default Level

2: System level

Parameters

hex-value: Specifies a hexadecimal TPID value, ranging from 0x0001 to 0xFFFF, excluding the common protocol type values listed in Table 47.

Table 47 Common protocol type values

Protocol type	Value
ARP	0x0806
PUP	0x0200
RARP	0x8035
IP	0x0800
IPv6	0x86DD
PPPoE	0x8863/0x8864
MPLS	0x8847/0x8848
IPX/SPX	0x8137
IS-IS	0x8000
LACP	0x8809
802.1X	0x888E
Cluster	0x88A7
Reserved	0xFFFD/0xFFFE/0xFFFF

Description

Use **qinq ethernet-type** to configure the TPID value in VLAN tags.

Use **undo qinq ethernet-type** to restore the default.

By default, the TPID value is 0x8100.

The TPID value configured on the HP 5120 EI switch applies to both the CVLAN tags and the SVLAN tags.

Examples

Set the TPID value to 0x8200 globally.

```
<Sysname> system-view
[Sysname] qinq ethernet-type 8200
```

qinq transparent-vlan

Syntax

qinq transparent-vlan *vlan-list*

undo qinq transparent-vlan { **all** | *vlan-list* }

View

Layer 2 Ethernet interface view, Layer 2 aggregate interface view, port group view

Default level

2: System level

Parameters

vlan-list: Specifies a list of existing VLANs in the format of *vlan-list* = { *vlan-id1* [**to** *vlan-id2*] }&<1-10>, where *vlan-id1* and *vlan-id2* represent the VLAN IDs and each range from 1 to 4094, *vlan-id2* cannot be smaller than *vlan-id1*, and &<1-10> indicates that you can specify up to 10 *vlan-id1* [**to** *vlan-id2*] parameters.

all: Specifies all VLANs.

Description

Use **qinq transparent-vlan** to configure VLAN transparent transmission on one or multiple ports, so the port or ports can transparently transmit frames from the specified VLANs.

Use **undo qinq transparent-vlan** to remove the configuration.

By default, VLAN transparent transmission is not configured on ports.

Configured in Layer 2 Ethernet interface view, the command takes effect on the interface only. Configured in Layer 2 aggregate interface view, the command takes effect on the Layer 2 aggregate interface and all the member ports in the aggregation group. Configured in port group view, the command takes effect on all ports in the port group.

Examples

Enable basic QinQ on GigabitEthernet 1/0/1, and configure GigabitEthernet 1/0/1 to transparently transmit frames from VLAN 2, VLAN 3, and VLAN 50 through VLAN 100.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] port link-type trunk
[Sysname-GigabitEthernet1/0/1] port trunk permit vlan 2 3 50 to 100
[Sysname-GigabitEthernet1/0/1] qinq enable
[Sysname-GigabitEthernet1/0/1] qinq transparent-vlan 2 3 50 to 100
```

qinq vid

Syntax

qinq vid *vlan-id*

undo qinq vid *vlan-id*

View

Layer 2 Ethernet interface view, Layer 2 aggregate interface view, port group view

2: System level

Parameters

vlan-id: Sets an outer VLAN ID, ranging from 1 to 4094.

Description

Use **qinq vid** to set the outer VLAN tag that the port adds to customer VLAN frames, and enter QinQ view.

Use **undo qinq vid** to remove all configurations corresponding to the outer VLAN ID performed in QinQ view.

By default, the outer VLAN tag is the port's PVID tag.

Configured in Layer 2 Ethernet interface view, the command takes effect on the interface only. Configured in Layer 2 aggregate interface view, the command takes effect on the Layer 2 aggregate interface and all the member ports in the aggregation group. Configured in port group view, the command takes effect on all ports in the port group.

An inner VLAN tag corresponds to only one outer VLAN tag. To change an outer VLAN tag, delete the old outer VLAN tagging policy and configure a new outer VLAN tag.

Related command: **raw-vlan-id inbound**.

Examples

\# Enable basic QinQ on GigabitEthernet 1/0/1, configure GigabitEthernet 1/0/1 to tag frames with outer VLAN 10, and enter QinQ view.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] qinq enable
[Sysname-GigabitEthernet1/0/1] qinq vid 10
[Sysname-GigabitEthernet1/0/1-vid-10]
```

\# Enable basic QinQ on all ports in port group 1, configure them to tag frames with outer VLAN 10, and enter QinQ view.

```
<Sysname> system-view
[Sysname] port-group manual 1
[Sysname-port-group-manual-1] group-member gigabitethernet 1/0/1 to gigabitethernet
1/0/6
[Sysname-port-group-manual-1] qinq enable
[Sysname-port-group-manual-1] qinq vid 10
[Sysname-port-group-manual-1-vid-10]
```

raw-vlan-id inbound

Syntax

raw-vlan-id inbound { **all** | *vlan-list* }

undo raw-vlan-id inbound { **all** | *vlan-list* }

View

QinQ view

Default level

2: System level

Parameters

vlan-list: Specifies a list of VLANs in the format of *vlan-list* = { *vlan-id1* [**to** *vlan-id2*] }&<1-10>, where *vlan-id1* and *vlan-id2* represent the VLAN IDs and each range from 1 to 4094, *vlan-id2* cannot be smaller than *vlan-id1*, and &<1-10> indicates that you can specify up to 10 *vlan-id1* [**to** *vlan-id2*] parameters.

all: Specifies all VLAN IDs.

Description

Use **raw-vlan-id inbound** to tag frames of the specified VLANs with the SVLAN.

Use **undo raw-vlan-id inbound** to remove the configuration.

By default, Ethernet ports do not tag VLAN frames with outer VLAN tags.

You can configure this command in the same view multiple times. A new configuration does not overwrite the previous ones and the configured values are automatically arranged in an ascending order.

Related commands: **qinq vid**.

Examples

Enable basic QinQ on GigabitEthernet 1/0/1 and configure GigabitEthernet 1/0/1 to tag frames from VLAN 3, VLAN 5, and VLANs 20 through 100 with SVLAN 100.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] qinq enable
[Sysname-GigabitEthernet1/0/1] qinq vid 100
[Sysname-GigabitEthernet1/0/1-vid-100] raw-vlan-id inbound 3 5 20 to 100
```

LLDP configuration commands

display lldp local-information

Syntax

> **display lldp local-information** [**global** | **interface** *interface-type interface-number*] [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

> Any view

Default level

> 1: Monitor level

Parameters

> **global**: Displays the global LLDP information to be sent.
>
> **interface** *interface-type interface-number*: Displays the LLDP information to be sent out of the interface specified by its type and number.
>
> **|**: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.
>
> **begin**: Displays the first line that matches the specified regular expression and all lines that follow.
>
> **exclude**: Displays all lines that do not match the specified regular expression.
>
> **include**: Displays all lines that match the specified regular expression.
>
> *regular-expression*: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

> Use **display lldp local-information** to display the LLDP information to be sent, which will be contained in the LLDP TLVs and sent to neighbor devices.
>
> If no keyword or argument is specified, this command displays all LLDP information to be sent, including the global LLDP information and the LLDP information about the LLDP-enabled ports in the up state.

Examples

> # Display all LLDP information to be sent.
> ```
> <Sysname> display lldp local-information
> Global LLDP local-information:
>   Chassis ID       : 00e0-fc00-5600
>   System name      : Sysname
>   System description : HP Comware Platform Software
>   System capabilities supported : Bridge,Router
>   System capabilities enabled   : Bridge,Router
>
>   MED information
>   Device class: Connectivity device
> ```

```
   (MED inventory information of master board)
   HardwareRev              : REV.A
   FirmwareRev              : 109
   SoftwareRev              : 5.20 Alpha 2101
   SerialNum                : NONE
   Manufacturer name        : HP
   Model name               : HP Comware
   Asset tracking identifier : Unknown
LLDP local-information of port 1[GigabitEthernet1/0/1]:
   Port ID subtype  : Interface name
   Port ID          : GigabitEthernet1/0/1
   Port description : GigabitEthernet1/0/1 Interface

   Management address type            : ipv4
   Management address                 : 192.168.1.11
   Management address interface type  : IfIndex
   Management address interface ID    : 54
   Management address OID             : 0

   Port VLAN ID(PVID): 1

   Port and protocol VLAN ID(PPVID) : 1
   Port and protocol VLAN supported : Yes
   Port and protocol VLAN enabled   : No

   VLAN name of VLAN 1: VLAN 0001

   Auto-negotiation supported : Yes
   Auto-negotiation enabled   : Yes
   OperMau                    : speed(1000)/duplex(Full)

   Power port class         : PSE
   PSE power supported       : Yes
   PSE power enabled         : Yes
   PSE pairs control ability : Yes
   Power pairs              : Signal
   Port power classification : Class 0
   Power type               : Type 2 PSE
   Power source             : Primary
   Power priority           : high
   PD requested power value  : 25.5(w)
   PSE allocated power value : 25.5(w)

   Link aggregation supported : Yes
   Link aggregation enabled   : No
   Aggregation port ID        : 0
```

```
   Maximum frame Size: 1536

   MED information
   Media policy type       : Unknown
   Unknown Policy          : Yes
   VLAN tagged             : No
   Media policy VlanID     : 0
   Media policy L2 priority : 0
   Media policy Dscp       : 0

   PoE PSE power source     : Primary
   Port PSE Priority        : high
   Port available power value: 25.5(w)
```

Table 48 Command output

Field	Description
Global LLDP local-information	Global LLDP information to be sent.
Chassis ID	Bridge MAC address of the device.
System capabilities supported	Supported capabilities: • **Bridge**—Switching is supported. • **Router**—Routing is supported.
System capabilities enabled	Enabled capabilities: • **Bridge**—Switching is enabled. • **Router**—Routing is enabled.
Device class	MED device class: • **Connectivity device**—Network device. • **Class I**—Normal terminal device. It requires the basic LLDP discovery services. • **Class II**—Media terminal device. It supports media streams, and can also function as a normal terminal device. • **Class III**—Communication terminal device. It supports the IP communication systems of end users, and can also function as a normal terminal device or media terminal device.
MED inventory information of master board	MED inventory information of the master of the IRF fabric.
HardwareRev	Hardware version.
FirmwareRev	Firmware version.
SoftwareRev	Software version.
SerialNum	Serial number.
Manufacturer name	Device manufacturer.
Model name	Device model.
LLDP local-information of port 1	LLDP information to be sent out of port 1.
Port ID subtype	Port ID type, which can be MAC address or interface name.
Port ID	Port ID, the value of which depends on the port ID subtype.

Field	Description
Management address interface type	Numbering type of the interface identified by the management address.
Management address interface ID	Index of the interface identified by the management address.
Management address OID	Management address object ID.
Port and protocol VLAN ID(PPVID)	Port protocol VLAN ID.
Port and protocol VLAN supported	Indicates whether or not protocol VLAN is supported on the port.
Port and protocol VLAN enabled	Indicates whether or not protocol VLAN is enabled on the port.
VLAN name of VLAN 1	Name of VLAN 1.
Auto-negotiation supported	Indicates whether or not auto-negotiation is supported on the port.
Auto-negotiation enabled	Indicates whether or not auto-negotiation is enabled on the port.
OperMau	Speed and duplex state of the port.
PoE supported	Indicates whether or not PoE is supported on the port.
Power port class	PoE device type when the device supports PoE. **PSE** indicates that the device is a power sourcing equipment**.**
PSE power supported	Indicates whether or not the device can operate as a PSE when the device supports PoE.
PSE power enabled	Indicates whether or not the device is operating as a PSE when the device supports PoE.
PSE pairs control ability	Indicates whether or not the PSE-PD pair control is available when the device supports PoE.
Power pairs	PoE mode when the device supports PoE: • **Signal**—PoE via signal lines • **Spare**—PoE via spare lines
Port power classification	Port power classification of the PD when the device supports PoE: • Class 0 • Class 1 • Class 2 • Class 3 • Class 4
Power type	This field appears only on the devices that support PoE+. PoE device type is Type 2 PSE, which provides a power of 0 W to 30 W, a voltage of 50 V to 57 V, and a current of up to 600 mA.
Power source	This field appears only on the devices that support PoE+. PSE power type: • **Unknown**—Unknown power supply • **Primary**—Primary power supply • **Backup**—Backup power supply

Field	Description
Power priority	This field appears only on the devices that support PoE+. PoE power supply priority of PSE ports: • Unknown • Critical • High • Low
PD requested power value	This field appears only on the devices that support PoE+. Power (in W) that the PD requests.
PSE allocated power value	This field appears only on the devices that support PoE+. Power (in W) that the PSE provides to the PD.
Link aggregation supported	Indicates whether or not link aggregation is supported.
Link aggregation enabled	Indicates whether or not link aggregation is enabled.
Aggregation port ID	Aggregation group ID, which is 0 when link aggregation is disabled.
MED information	MED LLDP information.
Media policy type	Media policy type: • unknown • voice • voiceSignaling • guestVoice • guestVoiceSignaling • softPhoneVoice • videoconferencing • streamingVideo • videoSignaling
Unknown Policy	Indicates whether or not the media policy is unknown.
VLAN tagged	Indicates whether or not packets of the media VLAN are tagged.
Media Policy VlanID	ID of the media VLAN.
Media Policy L2 priority	Layer 2 priority.
Media Policy Dscp	DSCP precedence.
Location format	When the port is allowed to advertise Location Identification TLVs, this field indicates the location information format: • **Invalid**—The format of the location information is invalid. • **Coordinate-based LCI**—The location information is coordinate-based. • **Civic Address LCI**—Typical address information. • **ECS ELIN**—Telephone number for urgencies.
Location Information	When the port is allowed to advertise Location Identification TLVs, this field displays the location information of the device.
PoE PSE power source	When the device is a PSE device, this field displays the PSE power type: • **Unknown**—Unknown power supply • **Primary**—Primary power supply • **Backup**—Backup power supply

Field	Description
Port PSE Priority	When the device is a PSE device, this field displays the PoE power supply priority of PSE ports: • Unknown • Critical • High • Low
Port available power value	When the device supports PoE, this field displays the available PoE power on PSE ports or power needed on PD ports, in watts.

display lldp neighbor-information

Syntax

display lldp neighbor-information [**brief** | **interface** *interface-type interface-number* [**brief**] | **list** [**system-name** *system-name*]] [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

1: Monitor level

Parameters

brief: Displays the summary of LLDP information sent from the neighboring devices. If this keyword is not specified, this command displays detailed LLDP information sent from the neighboring devices.

interface *interface-type interface-number*: Displays the LLDP information sent from the neighboring devices received through a port specified by its type and number. If this option is not specified, this command displays the LLDP information sent from the neighboring devices received through all ports.

list: Displays the LLDP information sent from the neighboring devices in the form of a list.

system-name *system-name*: Displays the LLDP information sent from a neighboring device specified by its system name. The *system-name* argument is a character string of 1 to 255 characters. If this option is not specified, this command displays the LLDP information sent from all neighboring devices in a list.

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display lldp neighbor-information** to display the LLDP information carried in LLDP TLVs sent from the neighboring devices.

Examples

\# Display the LLDP information sent from the neighboring devices received through all ports.

```
<Sysname> display lldp neighbor-information
```

```
LLDP neighbor-information of port 1[GigabitEthernet1/0/1]:
  Neighbor index    : 1
  Update time       : 0 days,0 hours,1 minutes,1 seconds
  Chassis type      : MAC address
  Chassis ID        : 000f-0055-0002
  Port ID type      : Interface name
  Port ID           : GigabitEthernet1/0/1
  Port description : GigabitEthernet1/0/1 Interface
  System name       : HP
  System description : HP Comware Platform Software
  System capabilities supported : Repeater,Bridge,Router
  System capabilities enabled   : Repeater,Bridge,Router

  Management address type          : ipv4
  Management address               : 192.168.1.55
  Management address interface type : IfIndex
  Management address interface ID   : Unknown
  Management address OID           : 0

  Port VLAN ID(PVID): 1

  Port and protocol VLAN ID(PPVID) : 1
  Port and protocol VLAN supported : Yes
  Port and protocol VLAN enabled   : No

  VLAN name of VLAN 1: VLAN 0001

  Auto-negotiation supported : Yes
  Auto-negotiation enabled   : Yes
  OperMau                    : speed(1000)/duplex(Full)

  Power port class          : PD
  PSE power supported       : No
  PSE power enabled         : No
  PSE pairs control ability : No
  Power pairs               : Signal
  Port power classification : Class 0
  Power type                : Type 2 PD
  Power source              : PSE and local
  Power priority            : high
  PD requested power value  : 25.5(w)
  PSE allocated power value : 25.5(w)

  Link aggregation supported : Yes
  Link aggregation enabled   : No
  Aggregation port ID        : 0

  Maximum frame Size: 1536
```

```
CDP neighbor-information of port 1[GigabitEthernet1/0/1]:
  CDP neighbor index : 2
  Chassis ID        : C4507
  Address           : 192.168.1.56
  Port ID           : GigabitEthernet1/0/1
  Software version  : Cisco IOS Software, Catalyst 4500 L3 Switch Software
(cat4500-ENTSERVICESK9-M), Version 12.2(31)SGA4, RELEASE SOFTWARE (fc1)
  Platform          : cisco WS-C4507R
  Duplex            : Full
```

Display the LLDP information sent from all neighboring devices in a list.

```
<Sysname> display lldp neighbor-information list

System Name          Local Interface Chassis ID     Port ID
System1              GE1/0/1          000f-e25d-ee91 GigabitEthernet1/0/5
System2              GE1/0/2          000f-e25d-ee92 GigabitEthernet1/0/6
System3              GE1/0/3          000f-e25d-ee93 GigabitEthernet1/0/7
```

Table 49 Command output

Field	Description
Information about LLDP neighbors:	
LLDP neighbor-information of port 1	LLDP information received through port 1.
Neighbor index	Index of the LLDP neighboring device.
Update time	Last time when LLDP information about a neighboring device was updated.
Chassis type	Chassis ID type of the LLDP neighboring device: • Chassis component • Interface alias • Port component • MAC address • Network address (the IP address type, such as **ipv4**) • Interface name • **Locally assigned**—Local configuration
Chassis ID	Chassis ID of the LLDP neighboring device, whose value type is the chassis ID type.
Port ID type	ID type of the port that connects the LLDP neighboring device to the local device: • Interface alias • Port component • MAC address • Network address (the IP address type, such as **ipv4**) • Interface name • Agent circuit ID • **Locally assigned**—Local configuration
Port ID	ID of the port that connects the LLDP neighboring device to the local device, whose type is the port ID type.

Field	Description
Port description	Description of the port that connects the LLDP neighboring device to the local device.
System name	System name of the LLDP neighboring device.
System description	System description of the LLDP neighboring device.
System capabilities supported	Capabilities supported on the LLDP neighboring device: • **Repeater**—Signal repeating is supported. • **Bridge**—Switching is supported. • **Router**—Routing is supported.
System capabilities enabled	Capabilities enabled on the LLDP neighboring device: • **Repeater**—Signal repeating is enabled. • **Bridge**—Switching is enabled. • **Router**—Routing is enabled.
Management address type	Management address type of the port that connects the LLDP neighboring device to the local device.
Management address	Management address of the port that connects the LLDP neighboring device to the local device.
Management address interface type	Management address interface type of the port that connects the LLDP neighboring device to the local device.
Management address OID	Management address object ID of the port that connects the LLDP neighboring device to the local device.
Port VLAN ID	Port VLAN ID of the port that connects the LLDP neighboring device to the local device.
Port and protocol VLAN ID(PPVID)	Port protocol VLAN ID of the port that connects the LLDP neighboring device to the local device.
Port and protocol VLAN supported	Indicates whether or not protocol VLAN is supported on the port that connects the LLDP neighboring device to the local device.
Port and protocol VLAN enabled	Indicates whether or not protocol VLAN is enabled on the port that connects the LLDP neighboring device to the local device.
VLAN name of VLAN 1	Name of VLAN 1.
Auto-negotiation supported	Indicates whether or not auto-negotiation is supported on the port that connects the LLDP neighboring device to the local device.
Auto-negotiation enabled	Indicates whether or not auto-negotiation is enabled on the port that connects the LLDP neighboring device to the local device.
OperMau	Speed and duplex state on the port that connects the LLDP neighboring device to the local device.
Power port class	PoE device type of the LLDP neighboring device: • **PSE**—The LLDP neighboring device is a power sourcing equipment. • **PD**—The LLDP neighboring device is a powered device (a PD device or non-PSE device).
PSE power supported	Indicates whether or not the LLDP neighboring device can operate as a PSE.

Field	Description
PSE power enabled	Indicates whether or not the LLDP neighboring device is operating as a PSE.
PSE pairs control ability	Indicates whether or not the PSE-PD pair control is available on the LLDP neighboring device.
Power pairs	PoE mode of the LLDP neighboring device: • **Signal**—PoE via signal lines • **Spare**—PoE via spare lines
Port power classification	Port power classification of the PD of the LLDP neighboring device: • Class 0 • Class 1 • Class 2 • Class 3 • Class 4
Power type	This field appears only on the devices that support PoE+. PD type of an LLDP neighboring device which is a PD device: • **Type 1 PD**—Receives a power of 0 W to 15.4 W, a voltage of 44 V to 57 V, and a current of up to 350 mA. • **Type 2 PD**—Receives a power of 0 W to 30 W, a voltage of 50 V to 57 V, and a current of up to 600 mA.
Power source	This field appears only on the devices that support PoE+. Power source type of an LLDP neighboring device which is a PD device: • **Unknown**—Unknown power supply • **PSE**—PSE power supply • **Local**—Local power supply • **PSE and local**—PSE and local power supplies
Power priority	This field appears only on the devices that support PoE+. PoE power receiving priority of ports on an LLDP neighboring device which is a PD device: • Unknown • Critical • High • Low
PD requested power value	This field appears only on the devices that support PoE+. Power (in W) that the LLDP neighboring device which is a PD device requests.
PSE allocated power value	This field appears only on the devices that support PoE+. Power (in W) that the PSE provides to the LLDP neighboring device which is a PD device.
Link aggregation supported	Indicates whether or not link aggregation is supported on the port that connects the LLDP neighboring device to the local device.
Link aggregation enabled	Indicates whether or not link aggregation is enabled on the port that connects the LLDP neighboring device to the local device.

Field	Description
Aggregation port ID	Aggregation group ID, which is 0 when link aggregation is disabled.
Maximum frame size	Maximum frame size of the port that connects the LLDP neighboring device to the local device.
Location format	Location information format of the neighboring device which is a communication terminal with the MED device type being Class III, for example, an IP phone: • **Invalid**—The format of the location information is invalid. • **Coordinate-based LCI**—The location information is coordinate-based. • **Civic Address LCI**—Typical address information. • **ECS ELIN**—Telephone for urgencies.
Location information	Location information of the neighboring device which is a communication terminal with the MED device type being Class III, for example, an IP phone.
PoE PSE power source	Power source type of an LLDP neighboring device which is a PSE device: • **Unknown**—Unknown power supply • **Primary**—Primary power supply • **Backup**—Backup power supply
PoE PD power source	PD power type of an LLDP neighboring device which is a PD device: • **Unknown**—Unknown power supply • **PSE**—PSE power supply • **Local**—Local power supply • **PSE and local**—PSE and local power supplies
Port PSE Priority	PoE power supply priority of ports on an LLDP neighboring device which is a PSE device: • Unknown • Critical • High • Low
Port PD Priority	PoE power receiving priority of ports on an LLDP neighboring device which is a PD device: • Unknown • Critical • High • Low
Port available power value	• Power supplied to the port when the LLDP neighboring device is a PSE device, in watts. • Power supplied by the port when the LLDP neighboring device is a PD device, in watts.
Unknown basic TLV	This field appears only when the device receives unknown basic TLVs.
TLV type	This field appears only when the device receives unknown basic TLVs. Unknown basic TLV type.

Field	Description
TLV information	This field appears only when the device receives unknown basic TLVs.
	Information contained in the unknown basic TLV type.
Unknown organizationally-defined TLV	This field appears only when the device receives unknown organizationally-defined TLVs.
	Unknown organizationally specific TLV.
TLV OUI	This field appears only when the device receives unknown organizationally-defined TLVs.
	OUI of the unknown organizationally specific TLV.
TLV subtype	This field appears only when the device receives unknown organizationally-defined TLVs.
	Unknown organizationally specific TLV subtype.
Index	This field appears only when the device receives unknown organizationally-defined TLVs.
	Unknown organization index.
TLV information	This field appears only when the device receives unknown organizationally-defined TLVs.
	Information contained in unknown organizationally specific TLV.
Local Interface	Local port that receives the LLDP information.
Information about CDP neighbors:	
CDP neighbor-information of port 1	CDP information received through port 1.
CDP neighbor index	Index of the CDP neighboring device.
Chassis ID	Name of the CDP neighboring device.
Address	IPv4 address of the port that connects the CDP neighboring device to the local device.
Port ID	ID of the port that connects the CDP neighboring device to the local device.
Software version	Software version of the CDP neighboring device.
Platform	Model of the CDP neighboring device.
Duplex	Duplex state of the port that connects the CDP neighboring device to the local device.

display lldp statistics

Syntax

display lldp statistics [**global** | **interface** *interface-type interface-number*] [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

1: Monitor level

Parameters

global: Displays the global LLDP statistics.

interface *interface-type interface-number*: Specifies a port by its type and number.

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display lldp statistics** to display the global LLDP statistics or the LLDP statistics of a port.

If no keyword or argument is specified, this command displays the global LLDP statistics as well as the LLDP statistics of all ports.

Examples

Display the global LLDP statistics as well as the LLDP statistics of all ports.

```
<Sysname> display lldp statistics
LLDP statistics global Information:
LLDP neighbor information last change time:0 days,0 hours,4 minutes,40 seconds
The number of LLDP neighbor information inserted : 1
The number of LLDP neighbor information deleted  : 1
The number of LLDP neighbor information dropped  : 0
The number of LLDP neighbor information aged out : 1
LLDP statistics information of port 1 [GigabitEthernet1/0/1]:
The number of LLDP frames transmitted        : 0
The number of LLDP frames received           : 0
The number of LLDP frames discarded          : 0
The number of LLDP error frames              : 0
The number of LLDP TLVs discarded            : 0
The number of LLDP TLVs unrecognized         : 0
The number of LLDP neighbor information aged out : 0
The number of CDP frames transmitted         : 0
The number of CDP frames received            : 0
The number of CDP frames discarded           : 0
The number of CDP error frames               : 0
```

Table 50 Command output

Field	Description
LLDP statistics global information	Global LLDP statistics.
LLDP neighbor information last change time	Time the neighbor information was last updated.
The number of LLDP neighbor information inserted	Number of times of adding neighbor information.
The number of LLDP neighbor information deleted	Number of times of removing neighbor information.
The number of LLDP neighbor information dropped	Number of times of dropping neighbor information due to lack of available memory space.

display lldp status

Syntax

> **display lldp status** [**interface** *interface-type interface-number*] [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

> Any view

Default level

> 1: Monitor level

Parameters

> **interface** *interface-type interface-number*: Specifies a port by its type and number.
>
> **|**: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.
>
> **begin**: Displays the first line that matches the specified regular expression and all lines that follow.
>
> **exclude**: Displays all lines that do not match the specified regular expression.
>
> **include**: Displays all lines that match the specified regular expression.
>
> *regular-expression*: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

> Use **display lldp status** to display LLDP status information.
>
> If no port is specified, this command displays the global LLDP status and the LLDP status information for all ports.

Examples

> # Display the global LLDP status as well as the LLDP status information of all ports.

```
<Sysname> display lldp status
Global status of LLDP: Enable
The current number of LLDP neighbors: 0
The current number of CDP neighbors: 0
LLDP neighbor information last changed time: 0 days,0 hours,0 minutes,0 seconds
Transmit interval           : 30s
Hold multiplier             : 4
Reinit delay                : 2s
Transmit delay              : 2s
Trap interval               : 5s
Fast start times            : 3
Port 1 [GigabitEthernet1/0/1]:
Port status of LLDP         : Enable
Admin status                : Tx_Rx
Trap flag                   : No
Polling interval            : 0s

Number of neighbors         : 0
```

```
Number of MED neighbors      : 0
Number of CDP neighbors      : 0
Number of sent optional TLV  : 23
Number of received unknown TLV : 0
```

Table 51 Command output

Field	Description
Global status of LLDP	Indicates whether or not LLDP is globally enabled.
LLDP neighbor information last changed time	Time when the neighbor information was last updated.
Transmit interval	LLDPDU transmit interval.
Hold multiplier	TTL multiplier.
Reinit delay	LLDP re-initialization delay.
Transmit delay	LLDPDU transmit delay.
Trap interval	Trap transmit interval.
Fast start times	Number of the LLDPDUs sent each time fast LLDPDU transmission is triggered.
Port 1	LLDP status of port 1.
Port status of LLDP	Indicates whether or not LLDP is enabled on the port.
Admin status	LLDP mode of the port: • **TxRx**—The port sends and receives LLDPDUs. • **Rx_Only**—The port only receives LLDPDUs. • **Tx_Only**—The port only sends LLDPDUs. • **Disable**—The port does not send or receive LLDPDUs.
Trap Flag	Indicates whether or not trapping is enabled.
Polling interval	LLDP polling interval, which is 0 when LLDP polling is disabled.
Number of neighbors	Number of LLDP neighbors connecting to the port.
Number of MED neighbors	Number of MED neighbors connecting to the port.
Number of CDP neighbors	Number of CDP neighbors connecting to the port.
Number of sent optional TLV	Number of optional TLVs contained in an LLDPDU sent through the port.
Number of received unknown TLV	Number of unknown TLVs contained in all received LLDPDUs.

display lldp tlv-config

Syntax

display lldp tlv-config [**interface** *interface-type interface-number*] [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

1: Monitor level

Parameters

interface *interface-type interface-number*: Specifies a port by its type and number.

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display lldp tlv-config** to display the types of advertisable optional LLDP TLVs of a port.

If no port is specified, this command displays the types of advertisable optional TLVs of each port.

Examples

Display the types of advertisable optional LLDP TLVs of interface GigabitEthernet 1/0/1.

```
<Sysname> display lldp tlv-config interface gigabitethernet 1/0/1
LLDP tlv-config of port 1[GigabitEthernet1/0/1]:
NAME                          STATUS      DEFAULT
Basic optional TLV:
Port Description TLV          YES         YES
System Name TLV              YES         YES
System Description TLV        YES         YES
System Capabilities TLV       YES         YES
Management Address TLV        YES         YES

IEEE 802.1 extend TLV:
Port VLAN ID TLV              YES         YES
Port And Protocol VLAN ID TLV  YES        YES
VLAN Name TLV                 YES         YES

IEEE 802.3 extend TLV:
MAC-Physic TLV                YES         YES
Power via MDI TLV             YES         YES
Link Aggregation TLV          YES         YES
Maximum Frame Size TLV        YES         YES

LLDP-MED extend TLV:
Capabilities TLV              YES          YES
Network Policy TLV            YES          YES
Location Identification TLV   NO           NO
Extended Power via MDI TLV    YES          YES
Inventory TLV                 YES          YES
```

Table 52 Command output

Field	Description
LLDP tlv-config of port 1	Advertisable optional TLVs of port 1.

Field	Description
NAME	TLV type.
STATUS	Indicates whether or not a specific type of TLV is sent through a port.
DEFAULT	Indicates whether or not a specific type of TLV is sent through a port by default.
Basic optional TLV	Basic TLVs: • Port description TLV • System name TLV • System description TLV • System capabilities TLV • Management address TLV
IEEE 802.1 extended TLV	IEEE 802.1 organizationally specific TLVs: • Port VLAN ID TLV • Port and protocol VLAN ID TLV • VLAN name TLV
IEEE 802.3 extended TLV	IEEE 802.3 organizationally specific TLVs: • MAC-Physic TLV • Power via MDI TLV • Link aggregation TLV • Maximum frame size TLV
LLDP-MED extend TLV	LLDP-MED TLVs: • Capabilities TLV • Network Policy TLV • Extended Power-via-MDI TLV • Location Identification TLV • Inventory TLV, including hardware revision TLV, firmware revision TLV, software revision TLV, serial number TLV, manufacturer name TLV, model name TLV, and asset id TLV

lldp admin-status

Syntax

lldp admin-status { disable | rx | tx | txrx }

undo lldp admin-status

View

Layer 2 Ethernet interface view, port group view

Default level

2: System level

Parameters

disable: Specifies the **Disable** mode. A port in this mode does not send or receive LLDPDUs.

rx: Specifies the **Rx** mode. A port in this mode only receives LLDPDUs.

tx: Specifies the **Tx** mode. A port in this mode only sends LLDPDUs.

txrx: Specifies the **TxRx** mode. A port in this mode sends and receives LLDPDUs.

Description

Use **lldp admin-status** to specify the LLDP operating mode for a port or all ports in a port group.

Use **undo lldp admin-status** to restore the default LLDP operating mode.

By default, the LLDP operating mode is **TxRx**.

Examples

Configure the LLDP operating mode as **Rx** for GigabitEthernet 1/0/1.
```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] lldp admin-status rx
```

lldp check-change-interval

Syntax

lldp check-change-interval *interval*

undo lldp check-change-interval

View

Layer 2 Ethernet interface view, port group view

Default level

2: System level

Parameters

interval: Sets the LLDP polling interval, ranging from 1 to 30 seconds.

Description

Use **lldp check-change-interval** to enable LLDP polling and set the polling interval.

Use **undo lldp check-change-interval** to restore the default.

By default, LLDP polling is disabled.

Examples

Enable LLDP polling on GigabitEthernet 1/0/1, setting the polling interval to 30 seconds.
```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] lldp check-change-interval 30
```

lldp compliance admin-status cdp

Syntax

lldp compliance admin-status cdp { **disable** | **txrx** }

undo lldp compliance admin-status cdp

View

Layer 2 Ethernet interface view, port group view

Default level

2: System level

Parameters

disable: Specifies the disable mode, where CDP-compatible LLDP cannot receive or transmit CDP packets.

txrx: Specifies the TxRx mode, where CDP-compatible LLDP can send and receive CDP packets.

Description

Use **lldp compliance admin-status cdp** to configure the operating mode of CDP-compatible LLDP on a port or port group.

Use **undo lldp compliance admin-status cdp** to restore the default.

By default, CDP-compatible LLDP operates in disable mode.

For your device to work with Cisco IP phones, you must enable CDP-compatible LLDP globally and then configure CDP-compatible LLDP to operate in TxRx mode on the specified ports.

Related commands: **lldp compliance cdp**.

Examples

\# Configure CDP-compatible LLDP to operate in TxRx mode on GigabitEthernet 1/0/1.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] lldp compliance admin-status cdp txrx
```

lldp compliance cdp

Syntax

lldp compliance cdp

undo lldp compliance cdp

View

System view

Default level

2: System level

Parameters

None

Description

Use **lldp compliance cdp** to enable global CDP compatibility.

Use **undo lldp compliance cdp** to restore the default.

By default, CDP compatibility is globally disabled.

Because the maximum TTL allowed by CDP is 255 seconds, the TTL configuration must be no more than 255 seconds for CDP-compatible LLDP to operate with Cisco IP phones. The TTL configuration is the product of the TTL multiplier and the LLDPDU transmit interval.

Related commands: **lldp hold-multiplier** and **lldp timer tx-interval**.

Examples

Enable LLDP to be compatible with CDP globally.

```
<Sysname> system-view
[Sysname] lldp compliance cdp
```

lldp enable

Syntax

lldp enable

undo lldp enable

View

System view, Layer 2 Ethernet interface view, port group view

Default level

2: System level

Parameters

None

Description

Use **lldp enable** to enable LLDP.

Use **undo lldp enable** to disable LLDP.

By default, LLDP is enabled on a port, and enabled globally.

LLDP takes effect on a port only when LLDP is enabled both globally and on the port.

Examples

Disable LLDP on GigabitEthernet 1/0/1.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] undo lldp enable
```

lldp encapsulation snap

Syntax

lldp encapsulation snap

undo lldp encapsulation

View

Layer 2 Ethernet interface view, port group view

Default level

2: System level

Parameters

None

Description

Use **lldp encapsulation snap** to configure the encapsulation format for LLDPDUs as SNAP on a port or a group of ports.

Use **undo lldp encapsulation** to restore the default encapsulation format for LLDPDUs.

By default, the encapsulation format for LLDPDUs is Ethernet II.

> NOTE:
>
> The command does not apply to LLDP-CDP packets, which use only SNAP encapsulation.

Examples

Configure the encapsulation format for LLDPDUs as SNAP on GigabitEthernet 1/0/1.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] lldp encapsulation snap
```

lldp fast-count

Syntax

lldp fast-count *count*

undo lldp fast-count

View

System view

Default level

2: System level

Parameters

count: Sets the number of the LLDPDUs sent each time fast LLDPDU transmission is triggered. The argument ranges from 1 to 10.

Description

Use **lldp fast-count** to set the number of the LLDPDUs sent each time fast LLDPDU transmission is triggered.

Use **undo lldp fast-count** to restore the default.

By default, the number is 3.

Examples

Configure the device to send four LLDPDUs each time fast LLDPDU transmission is triggered.

```
<Sysname> system-view
[Sysname] lldp fast-count 4
```

lldp hold-multiplier

Syntax

lldp hold-multiplier *value*

undo lldp hold-multiplier

View

System view

Default level

2: System level

Parameters

value: Sets the TTL multiplier, ranging from 2 to 10.

Description

Use **lldp hold-multiplier** to set the TTL multiplier.

Use **undo lldp hold-multiplier to** restore the default.

By default, the TTL multiplier is 4.

You can set the TTL of the local device information by configuring the TTL multiplier.

The TTL configuration of a device is determined by the following expression:

TTL multiplier × LLDPDU transmit interval

The TTL can be up to 65535 seconds. Longer TTLs will be rounded off to 65535 seconds.

Related commands: **lldp timer tx-interval**.

Examples

Set the TTL multiplier to 6.
```
<Sysname> system-view
[Sysname] lldp hold-multiplier 6
```

lldp management-address-format string

Syntax

lldp management-address-format string

undo lldp management-address-format

View

Layer 2 Ethernet interface view, port group view

Default level

2: System level

Parameters

None

Description

Use **lldp management-address-format string** to encapsulate the management address in the form of strings in TLVs.

Use **undo lldp management-address-format** to restore the default.

By default, the management address is encapsulated in the form of numbers in TLVs.

Configure GigabitEthernet 1/0/1 to encapsulate the management address in the form of strings in management address TLVs.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] lldp management-address-format string
```

lldp management-address-tlv

Syntax

lldp management-address-tlv [*ip-address*]

undo lldp management-address-tlv

View

Layer 2 Ethernet interface view, port group view

Default level

2: System level

Parameters

ip-address: Specifies a management address to be advertised in LLDPDUs.

Description

Use **lldp management-address-tlv** to enable management address advertising and set the management address.

Use **undo lldp management-address-tlv** to disable management address advertising in LLDPDUs.

By default, the management address is advertised through LLDPDUs. For a Layer 2 Ethernet port, the management address is the main IP address of the lowest-ID VLAN carried on the port. If none of the carried VLANs is assigned an IP address, no management address will be advertised.

An LLDPDU carries only one management address TLV. If you set the management address repeatedly, the latest one takes effect.

In Layer 2 Ethernet interface view, if you run the **lldp management-address-tlv** command without specifying the *ip-address* argument, the advertised management address is the main IP address of the lowest-ID VLAN carried on the interface. If none of the carried VLANs is assigned an IP address, no management address will be advertised.

Examples

Set the management address to 192.6.0.1 for GigabitEthernet 1/0/1.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] lldp management-address-tlv 192.6.0.1
```

lldp notification remote-change enable

Syntax

lldp notification remote-change enable

undo lldp notification remote-change enable

Layer 2 Ethernet interface view, port group view

Default level

2: System level

Parameters

None

Description

Use **lldp notification remote-change enable** to enable LLDP trapping for a port or all ports in a port group.

Use **undo lldp notification remote-change enable** to disable LLDP trapping.

By default, LLDP trapping is disabled on ports.

Examples

\# Enable LLDP trapping for GigabitEthernet 1/0/1.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] lldp notification remote-change enable
```

lldp timer notification-interval

Syntax

lldp timer notification-interval *interval*

undo lldp timer notification-interval

View

System view

Default level

2: System level

Parameters

interval: Sets the LLDP trap transmit interval, ranging from 5 to 3600 seconds.

Description

Use **lldp timer notification-interval** to set the LLDP trap transmit interval.

Use **undo lldp timer notification-interval** to restore the default.

By default, the LLDP trap transmit interval is 5 seconds.

Examples

\# Set the LLDP trap transmit interval to 8 seconds.

```
<Sysname> system-view
[Sysname] lldp timer notification-interval 8
```

lldp timer reinit-delay

Syntax

lldp timer reinit-delay *delay*

undo lldp timer reinit-delay

View

System view

Default level

2: System level

Parameters

delay: Sets the LLDP re-initialization delay, ranging from 1 to 10 seconds.

Description

Use **lldp timer reinit-delay** to set the LLDP re-initialization delay.

Use **undo lldp timer reinit-delay** to restore the default.

By default, the LLDP re-initialization delay is 2 seconds.

Examples

Set the LLDP re-initialization delay to 4 seconds.
```
<Sysname> system-view
[Sysname] lldp timer reinit-delay 4
```

lldp timer tx-delay

Syntax

lldp timer tx-delay *delay*

undo lldp timer tx-delay

View

System view

Default level

2: System level

Parameters

delay: Sets the LLDPDU transmit delay, ranging from 1 to 8192 seconds.

Description

Use **lldp timer tx-delay** to set the LLDPDU transmit delay.

Use **undo lldp timer tx-delay** to restore the default.

By default, the LLDPDU transmit delay is 2 seconds.

It is a good practice to set the LLDPDU transmit delay to be no greater than a quarter of the LLDPDU transmit interval.

If the LLDPDU transmit delay is greater than the LLDPDU transmit interval, the device uses the LLDPDUs transmit delay as the transmit interval.

Related commands: **lldp timer tx-interval**.

Examples

Set the LLDPDU transmit delay to 4 seconds.

```
<Sysname> system-view
[Sysname] lldp timer tx-delay 4
```

lldp timer tx-interval

Syntax

lldp timer tx-interval *interval*

undo lldp timer tx-interval

View

System view

Default level

2: System level

Parameters

interval: Sets the LLDPDU transmit interval, ranging from 5 to 32768 seconds.

Description

Use **lldp timer tx-interval** to set the LLDPDU transmit interval.

Use **undo lldp timer tx-interval** to restore the default.

By default, the LLDPDU transmit interval is 30 seconds.

It is a good practice to set the LLDPDU transmit interval to be no less than four times the LLDPDU transmit delay.

If the LLDPDU transmit interval is less than the LLDPDU transmit delay, the device uses the LLDPDUs transmit delay as the transmit interval.

Related commands: **lldp timer tx-delay**.

Examples

Set the LLDPDU transmit interval to 20 seconds.

```
<Sysname> system-view
[Sysname] lldp timer tx-interval 20
```

lldp tlv-enable

Syntax

lldp tlv-enable { **basic-tlv** { **all** | **port-description** | **system-capability** | **system-description** | **system-name** } | **dot1-tlv** { **all** | **port-vlan-id** | **protocol-vlan-id** [*vlan-id*] | **vlan-name** [*vlan-id*] } | **dot3-tlv** { **all** | **link-aggregation** | **mac-physic** | **max-frame-size** | **power** } | **med-tlv** { **all** | **capability** | **inventory** | **location-id** { **civic-address** *device-type country-code* { *ca-type ca-value* }&<1-10> | **elin-address** *tel-number* } | **network-policy** | **power-over-ethernet** } }

undo lldp tlv-enable { **basic-tlv** { **all** | **port-description** | **system-capability** | **system-description** | **system-name** } | **dot1-tlv** { **all** | **port-vlan-id** | **protocol-vlan-id** | **vlan-name** } | **dot3-tlv** { **all** |

link-aggregation | mac-physic | max-frame-size | power } | med-tlv { all | capability | inventory | location-id | network-policy | power-over-ethernet } }

View

Layer 2 Ethernet interface view, port group view

Default level

2: System level

Parameters

all: Advertises all basic LLDP TLVs, IEEE 802.1 organizationally specific LLDP TLVs, or IEEE 802.3 organizationally specific LLDP TLVs when the **all** keyword is specified for **basic-tlv**, **dot1-tlv**, or **dot3-tlv**; or advertises all LLDP-MED TLVs except location identification TLVs when the **all** keyword is specified for **med-tlv**.

basic-tlv: Advertises basic LLDP TLVs.

port-description: Advertises port description TLVs.

system-capability: Advertises system capabilities TLVs.

system-description: Advertises system description TLVs.

system-name: Advertises system name TLVs.

dot1-tlv: Advertises IEEE 802.1 organizationally specific LLDP TLVs.

port-vlan-id: Advertises port VLAN ID TLVs.

protocol-vlan-id [*vlan-id*]: Advertises port and protocol VLAN ID TLVs. The *vlan-id* argument specifies the ID of the VLAN to be advertised, and ranges from 1 to 4094. By default, the *vlan-id* argument is the least VLAN ID on the port.

vlan-name [*vlan-id*]: Advertises VLAN name TLVs. The *vlan-id* argument specifies the ID of the VLAN to be advertised, and ranges from 1 to 4094. By default, the *vlan-id* argument is the least VLAN ID on the port.

dot3-tlv: Advertises IEEE 802.3 organizationally specific LLDP TLVs.

link-aggregation: Advertises link aggregation TLVs.

mac-physic: Advertises MAC/PHY configuration/status TLVs.

max-frame-size: Advertises maximum frame size TLVs.

power: Advertises power via MDI TLVs and power stateful control TLVs.

med-tlv: Advertises LLDP-MED TLVs.

capability: Advertises LLDP-MED capabilities TLVs.

inventory: Advertises the following TLVs: hardware revision, firmware revision, software revision, serial number, manufacturer name, model name, and asset ID.

location-id: Advertises location identification TLVs.

civic-address: Inserts the normal address information about the network device in location identification TLVs .

device-type: Sets a device type value, ranging from 0 to 2. Value 0 specifies a DHCP server. Value 1 specifies a switch. Value 2 specifies an LLDP-MED endpoint.

country-code: Sets a country code, corresponding to ISO 3166.

{ *ca-type ca-value* }&<1-10>: Configures address information, where *ca-type* represents the address information type, ranging from 0 to 255, *ca-value* represents address information, a string of 1 to 250 characters, and &<1-10> indicates that you can enter up to 10 parameters.

elin-address: Inserts telephone numbers for emergencies in location identification TLVs.

tel-number: Sets the telephone number for emergencies, a string of 10 to 25 characters.

network-policy: Advertises network policy TLVs.

power-over-ethernet: Advertises extended power-via-MDI TLVs.

Description

Use **lldp tlv-enable** to configure the types of advertisable TLVs for a port or all ports in a port group.

Use **undo lldp tlv-enable** to disable the advertising of specific types of TLVs.

By default, the device can advertise on a Layer 2 Ethernet port all types of LLDP TLVs, except location identification TLVs.

To enable the device to advertise LLDP-MED TLVs, you must first enable it to advertise LLDP-MED capabilities TLVs.

To disable the device from advertising LLDP-MED capabilities TLVs, you must first disable it from advertising other LLDP-MED TLVs.

To disable the device from advertising MAC/PHY configuration/status TLVs, you must first disable it from advertising LLDP-MED capabilities TLVs.

If you enable the device to advertise LLDP-MED capabilities TLVs, you also enable it to advertise MAC/PHY configuration/status TLVs.

To enable the device to advertise multiple types of TLVs, you can execute the **lldp tlv-enable** command repeatedly without the **all** keyword specified.

Examples

Enable the device to advertise link aggregation TLVs of the IEEE 802.3 organizationally specific TLVs on GigabitEthernet 1/0/1.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] lldp tlv-enable dot3-tlv link-aggregation
```

MVRP commands

display mvrp running-status

Syntax

> **display mvrp running-status** [**interface** *interface-list*] [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

> Any view

Default level

> 1: Monitor level

Parameters

> **interface** *interface-list*: Specifies an Ethernet interface list in the form of *interface-list* = { *interface-type interface-number1* [**to** *interface-type interface-number2*] }&<1-10>, where *interface-type interface-number* specifies an interface by its type and number and &<1-10> indicates that you can specify up to 10 *interface-type interface-number1* [**to** *interface-type interface-number2*] parameters. If this option is not specified, this command displays MVRP running status of all MVRP-enabled trunk ports.
>
> **|**: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.
>
> **begin**: Displays the first line that matches the specified regular expression and all lines that follow.
>
> **exclude**: Displays all lines that do not match the specified regular expression.
>
> **include**: Displays all lines that match the specified regular expression.
>
> *regular-expression*: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

> Use **display mvrp running-status** to display the MVRP running status.

Examples

> # Display the MVRP running status of all ports.

```
<Sysname> display mvrp running-status
 -------[MVRP Global Info]-------
 Global Status     : Enabled
 Compliance-GVRP   : False

 ----[GigabitEthernet1/0/1]----
 Config  Status                    : Enabled
 Running Status                    : Enabled
 Join Timer                        : 20 (centiseconds)
 Leave Timer                       : 60 (centiseconds)
 Periodic Timer                    : 100 (centiseconds)
 LeaveAll Timer                    : 1000 (centiseconds)
 Registration Type                 : Normal
```

```
Local VLANs :
 1(default), 2-10,
```

Table 53 Command output

Field	Description
MVRP Global Info	Global MVRP information.
Global Status	Global MVRP status: • Enabled • Disabled
Compliance-GVRP	GVRP compatibility status: • **True**—Compatible • **False**—Incompatible
---[GigabitEthernet1/0/1] ---	Interface prompt. The information between the current interface prompt and the next interface prompt is information about the current interface.
Config Status	Whether MVRP is enabled on the port: • Enabled • Disabled
Running Status	Whether MVRP takes effect on the port (determined by the link state and MVRP enabling status of the port): • Enabled • Disabled
Join Timer	Join timer, in centiseconds.
Leave Timer	Leave timer, in centiseconds.
Periodic Timer	Periodic timer, in centiseconds.
LeaveAll Timer	LeaveAll timer, in centiseconds.
Registration Type	MVRP registration mode: • Fixed • Forbidden • Normal
Local VLANs	VLAN information in the local database, which displays the VLANs learned through MVRP.

display mvrp state

Syntax

display mvrp state interface *interface-type interface-number* **vlan** *vlan-id* [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

0: Visit level

Parameters

interface *interface-type interface-number*: Displays the MVRP state of an interface specified by its type and number.

vlan *vlan-id*: Displays the MVRP state of an interface in an VLAN specified by its VLAN ID, which ranges from 1 to 4094.

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display mvrp state** to display the MVRP state of an interface in a VLAN.

Examples

Display the MVRP state of port GigabitEthernet 1/0/1 in VLAN 2.

```
<Sysname> display mvrp state interface gigabitethernet 1/0/1 vlan 2
MVRP state of VLAN 2 on port GE1/0/1
    Port      VLAN   App-state   Reg-state
 ----------- ------ ----------- -----------
  GE1/0/1        2      VP          IN
```

Table 54 Command output

Field	Description
MVRP state of VLAN 2 on port GE1/0/1	MVRP state of GigabitEthernet 1/0/1 in VLAN 2.

Field	Description
App-state	Declaration state, which indicates the state of the attribute that the local participant declares to the remote participant. The state can be VO, VP, VN, AN, AA, QA, LA, AO, QO, AP, QP, or LO. Each state consists of two letters.
	The first letter indicates the state:
	• **V**—Very anxious, which means that the local participant has not declared the attribute or has not received any Join message containing the attribute.
	• **A**—Anxious, which means that the local participant has declared the attribute once or has received one Join message containing the attribute.
	• **Q**—Quiet, which means that the local participant has declared the attribute two times, the local participant has declared the attribute once and has received one Join message containing the attribute, or the local participant has received two Join messages containing the attribute.
	• **L**—Leaving, which means that the local participant is deregistering the attribute.
	The second letter indicates the membership state:
	• **A**—Active member, which means that the local participant is declaring the attribute, has sent at least one Join message containing the attribute, and may receive Join messages.
	• **P**—Passive member, which means that the local participant is declaring the attribute, has received Join messages containing the attribute, but has not sent Join messages containing the attribute.
	• **O**—Observer, which means that the local participant is not declaring the attribute but is monitoring the attribute.
	• **N**—New, which means that the local participant is declaring the attribute, is receiving the Join message containing the attribute, but is not sending Join messages for the attribute.
	For example, VP indicates "Very anxious, Passive member".
Reg-state	Registration state of the attribute declared by remote participants on the local participant. The state can be IN, LV, or MT:
	• **IN**—Registered.
	• **LV**—Previously registered, but now being timed out.
	• **MT**—Not registered.

display mvrp statistics

Syntax

display mvrp statistics [**interface** *interface-list*] [**|** { **begin** | **exclude** | **include** } *regular-expression*]

View

Any view

Default level

1: Monitor level

Parameters

interface *interface-list*: Specifies an Ethernet interface list in the form of *interface-list* = { *interface-type interface-number1* [**to** *interface-type interface-number2*] }&<1-10>, where *interface-type interface-number* specifies an interface by its type and number and &<1-10> indicates that you can

specify up to 10 interfaces or interface ranges. If this option is not specified, this command displays MVRP statistics of all MVRP-enabled trunk ports.

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display mvrp statistics** to display MVRP statistics.

Examples

Display MVRP statistics of all MVRP-enabled ports.

```
<Sysname> display mvrp statistics

 ----[GigabitEthernet1/0/1]----
Failed Registrations         : 1
Last PDU Origin              : 000f-e200-0010
Frames Received              : 201
 New Event Received                : 0
 JoinIn Event Received             : 1167
 In Event Received                 : 0
 JoinMt Event Received             : 22387
 Mt Event Received                 : 31
 Leave Event Received              : 210
 LeaveAll Event Received           : 63
Frames Transmitted           : 47
 New Event Transmitted             : 0
 JoinIn Event Transmitted          : 311
 In Event Transmitted              : 0
 JoinMt Event Transmitted          : 873
 Mt Event Transmitted              : 11065
 Leave Event Transmitted           : 167
 LeaveAll Event Transmitted        : 4
Frames Discarded             : 0

 ----[GigabitEthernet1/0/2]----
Failed Registrations         : 0
Last PDU Origin              : 0000-0000-0000
Frames Received              : 0
 New Event Received                : 0
 JoinIn Event Received             : 0
 In Event Received                 : 0
 JoinMt Event Received             : 0
 Mt Event Received                 : 0
 Leave Event Received              : 0
```

```
    LeaveAll Event Received        : 0
Frames Transmitted            : 0
 New Event Transmitted         : 0
 JoinIn Event Transmitted      : 0
 In Event Transmitted          : 0
 JoinMt Event Transmitted      : 0
 Mt Event Transmitted          : 0
 Leave Event Transmitted       : 0
 LeaveAll Event Transmitted    : 0
Frames Discarded             : 0
```

Table 55 Command output

Field	Description
---[GigabitEthernet1/0/1]---	Interface prompt. The statistics between the current interface prompt and the next interface prompt are statistics of the current interface.
Failed Registrations	Number of VLAN registration failures through MVRP on the local participant.
Last PDU Origin	Source MAC address of the last MVRP PDU.
Frames Received	Number of MVRP protocol packets received
New Event Received	Number of New attribute events received.
JoinIn Event Received	Number of JoinIn attribute events received.
In Event Received	Number of In attribute events received.
JoinMt Event Received	Number of JoinMt attribute events received.
Mt Event Received	Number of Mt attribute events received.
Leave Event Received	Number of Leave attribute events received.
LeaveAll Event Received	Number of LeaveAll attribute events received.
Frames Transmitted	Number of MVRP protocol packets sent.
New Event Transmitted	Number of New attribute events sent.
JoinIn Event Transmitted	Number of JoinIn attribute events sent.
In Event Transmitted	Number of In attribute events sent.
JoinMt Event Transmitted	Number of JoinMt attribute events sent.
Mt Event Transmitted	Number of Mt attribute events sent.
Leave Event Transmitted	Number of Leave attribute events sent.
LeaveAll Event Transmitted	Number of LeaveAll attribute events sent.
Frames Discarded	Number of MVRP protocol packets dropped.

display mvrp vlan-operation

Syntax

display mvrp vlan-operation interface *interface-type interface-number* [**|** { **begin** | **exclude** | **include** } *regular-expression*]

253

View

Any view

Default level

0: Visit level

Parameters

interface *interface-type interface-number*: Displays the dynamic VLAN operations of an interface specified its type and number.

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

begin: Displays the first line that matches the specified regular expression and all lines that follow.

exclude: Displays all lines that do not match the specified regular expression.

include: Displays all lines that match the specified regular expression.

regular-expression: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

Description

Use **display mvrp vlan-operation** to display the dynamic VLAN operations of an interface.

These dynamic VLANs refer to the VLANs that are dynamically learned through MVRP and have not taken effect on the local device.

If a dynamic VLAN learned through MVRP is an existing static VLAN on the device or a VLAN reserved for a protocol, the dynamic VLAN does not take effect on the local device.

Examples

Display the dynamic VLAN operations of GigabitEthernet 1/0/1.

```
<Sysname> display mvrp vlan-operation interface gigabitethernet 1/0/1
 Dynamic VLAN operations on port GigabitEthernet1/0/1
  Operations of creating VLAN:  2-100
  Operations of deleting VLAN:  none
  Operations of adding VLAN to Trunk:  2-100
  Operations of deleting VLAN from Trunk:  none
```

Table 56 Command output

Field	Description
Operations of adding VLAN to Trunk	Operations of adding VLANs to trunk ports
Operations of deleting VLAN from Trunk	Operations of removing VLAN from trunk ports

mrp timer join

Syntax

mrp timer join *timer-value*

undo mrp timer join

View

Layer 2 Ethernet port view, Layer 2 aggregate interface view, port group view

Default level

2: System level

Parameters

timer-value: Join timer value (in centiseconds). The Join timer must be less than half the Leave timer, and must be a multiple of 20.

Description

Use **mrp timer join** to set the Join timer.

Use **undo mrp timer join** to restore the default.

By default, the Join timer is 20 centiseconds.

You will fail to restore the default Join timer if the default Join timer is not less than half the Leave timer.

Related commands: **display mvrp running-status** and **mrp timer leave**.

Examples

Set the Join timer to 40 centiseconds. (Suppose the Leave timer is 100 centiseconds)

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] mrp timer join 40
```

mrp timer leave

Syntax

mrp timer leave *timer-value*

undo mrp timer leave

View

Layer 2 Ethernet port view, Layer 2 aggregate interface view, port group view

Default level

2: System level

Parameters

timer-value: Leave timer value (in centiseconds). The Leave timer must be greater than two times the Join timer, less than the LeaveAll timer, and a multiple of 20.

Description

Use **mrp timer leave** to set the Leave timer.

Use **undo mrp timer leave** to restore the default.

By default, the Leave timer is 60 centiseconds.

You will fail to restore the default Leave timer if the default Leave timer is not greater than two times the Join timer or not less than the LeaveAll timer.

Related commands: **display mvrp running-status**, **mrp timer join**, and **mrp timer leaveall**.

Examples

Set the Leave timer to 100 centiseconds. (Suppose the Join and LeaveAll timer use their default settings)

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
```

```
[Sysname-GigabitEthernet1/0/1] mrp timer leave 100
```

mrp timer leaveall

Syntax

mrp timer leaveall *timer-value*

undo mrp timer leaveall

View

Layer 2 Ethernet port view, Layer 2 aggregate interface view, port group view

Default level

2: System level

Parameter

timer-value: LeaveAll timer value (in centiseconds). The LeaveAll timer must be greater than any Leave timer on each port, no greater than 32760, and a multiple of 20.

Description

Use **mrp timer leaveall** to set the LeaveAll timer.

Use **undo mrp timer leaveall** to restore the default.

By default, the LeaveAll timer is 1000 centiseconds.

You will fail to restore the default LeaveAll timer if the default LeaveAll timer is not greater than any Leave timer on each port.

Each time when the LeaveAll timer of a port expires, all attributes of the MSTIs on the port are deregistered throughout the network, and such a deregistration affects a large portion of the network. Do not set too small a value for the LeaveAll timer, and make sure that the LeaveAll timer is greater than any Leave timer on each port.

To keep the dynamic VLANs learned through MVRP stable, do not set the LeaveAll timer smaller than its default value (1000 centiseconds).

To avoid the case that the LeaveAll timer of a fixed participant always first expires, the switch randomly changes the LeaveAll timer within a certain range when the MRP participant restarts its LeaveAll timer.

Related commands: **display mvrp running-status** and **mrp timer leave**.

Examples

Set the LeaveAll timer to 1500 centiseconds. (Suppose the Leave timer is restored to the default)

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] mrp timer leaveall 1500
```

mrp timer periodic

Syntax

mrp timer periodic *timer-value*

undo mrp timer periodic

Default

The Periodic timer is 100 centiseconds.

View

Layer 2 Ethernet port view, Layer 2 aggregate interface view, port group view

Default level

2: System level

Parameters

timer-value: Periodic timer (in centiseconds), which can be 0 or 100.

Description

Use **mrp timer periodic** to set the Periodic timer.

Use **undo mrp timer periodic** to restore the default.

By default, the Periodic timer is 100 centiseconds.

Setting the Periodic timer to 0 disables periodic transmission of MRP messages. Setting the Periodic timer to 100 enables periodic transmission of MRP messages.

Related commands: **display mvrp running-status**.

Examples

Set the Periodic timer to 0 centiseconds.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] mrp timer periodic 0
```

mvrp global enable

Syntax

mvrp global enable

undo mvrp global enable

View

System view

Default level

2: System level

Description

Use **mvrp global enable** to enable MVRP globally.

Use **undo mvrp global enable** to restore the default.

By default, MVRP is disabled globally.

Disabling MVRP globally also disables MVRP on all ports.

Related commands: **display mvrp running-status** and **mvrp enable**.

Examples

Enable MVRP globally.

```
<Sysname> system-view
```

```
[Sysname] mvrp global enable
```

mvrp enable

Syntax

mvrp enable

undo mvrp enable

View

Layer 2 Ethernet port view, Layer 2 aggregate interface view, port group view

Default level

2: System level

Description

Use **mvrp enable** to enable MVRP on a port.

Use **undo mvrp enable** to disable MVRP on a port.

By default, MVRP is disabled on a port.

To enable MVRP on a port, first enable MVRP globally.

Disabling MVRP globally also disables MVRP on each port.

This command is available only on trunk ports.

You cannot change the link type of MVRP-enabled trunk port.

Related commands: **display mvrp running-status** and **mvrp global enable**.

Examples

Configure GigabitEthernet 1/0/1 as a trunk port, and enable MVRP on it.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] port link-type trunk
[Sysname-GigabitEthernet1/0/1] port trunk permit vlan all
[Sysname-GigabitEthernet1/0/1] mvrp enable
```

mvrp gvrp-compliance

Syntax

mvrp gvrp-compliance enable

undo mvrp gvrp-compliance enable

View

System view

Default level

2: System level

Description

Use **mvrp gvrp-compliance enable** to enable GVRP compatibility, so that the device can process both MVRP protocol packets and GVRP protocol packets.

Use **undo mvrp gvrp-compliance enable** to restore the default.

By default, GVRP compatibility is disabled.

Examples

Enable GVRP compatibility.

```
<Sysname> system-view
[Sysname] mvrp gvrp-compliance enable
```

mvrp registration

Syntax

mvrp registration { **fixed** | **forbidden** | **normal** }

undo mvrp registration

View

Layer 2 Ethernet port view, Layer 2 aggregate interface view, port group view

Default level

2: System level

Parameters

fixed: Specifies the fixed registration mode.

forbidden: Specifies the forbidden registration mode.

normal: Specifies the normal registration mode.

Description

Use **mvrp registration** to set the MVRP registration mode on the port.

Use **undo mvrp registration** to restore the default.

By default, the MVRP registration mode is normal.

This command is available only on trunk ports.

Related commands: **display mvrp running-status**.

Examples

Configure GigabitEthernet 1/0/1 as a trunk port, and set the MVRP registration mode to fixed on the port.

```
<Sysname> system-view
[Sysname] interface gigabitethernet 1/0/1
[Sysname-GigabitEthernet1/0/1] port link-type trunk
[Sysname-GigabitEthernet1/0/1] port trunk permit vlan all
[Sysname-GigabitEthernet1/0/1] mvrp registration fixed
```

reset mvrp statistics

Syntax

reset mvrp statistics [**interface** *interface-list*]

View

User view

Default level

2: System level

Parameters

interface *interface-list*: Specifies an Ethernet interface list in the form of *interface-list* = { *interface-type interface-number1* [**to** *interface-type interface-number2*] }&<1-10>, where *interface-type interface-number* specifies an interface by its type and number and &<1-10> indicates that you can specify up to 10 interfaces or interface ranges. If this option is not specified, the command clears MVRP statistics of all ports.

Description

Use **reset mvrp statistics** to clear the MVRP statistics of ports.

Related commands: **display mvrp statistics**.

Examples

Clear the MVRP statistics of all ports.

```
<Sysname> reset mvrp statistics
```

Support and other resources

Contacting HP

For worldwide technical support information, see the HP support website:

http://www.hp.com/support

Before contacting HP, collect the following information:

- Product model names and numbers
- Technical support registration number (if applicable)
- Product serial numbers
- Error messages
- Operating system type and revision level
- Detailed questions

Subscription service

HP recommends that you register your product at the Subscriber's Choice for Business website:

http://www.hp.com/go/wwalerts

After registering, you will receive email notification of product enhancements, new driver versions, firmware updates, and other product resources.

Related information

Documents

To find related documents, browse to the Manuals page of the HP Business Support Center website:

http://www.hp.com/support/manuals

- For related documentation, navigate to the Networking section, and select a networking category.
- For a complete list of acronyms and their definitions, see *HP FlexNetwork Technology Acronyms.*

Websites

- HP.com http://www.hp.com
- HP Networking http://www.hp.com/go/networking
- HP manuals http://www.hp.com/support/manuals
- HP download drivers and software http://www.hp.com/support/downloads
- HP software depot http://www.software.hp.com
- HP Education http://www.hp.com/learn

Conventions

This section describes the conventions used in this documentation set.

Command conventions

Convention	Description
Boldface	**Bold** text represents commands and keywords that you enter literally as shown.
Italic	*Italic* text represents arguments that you replace with actual values.
[ ]	Square brackets enclose syntax choices (keywords or arguments) that are optional.
{ x | y | ... }	Braces enclose a set of required syntax choices separated by vertical bars, from which you select one.
[x | y | ...]	Square brackets enclose a set of optional syntax choices separated by vertical bars, from which you select one or none.
{ x | y | ... } *	Asterisk-marked braces enclose a set of required syntax choices separated by vertical bars, from which you select at least one.
[x | y | ...] *	Asterisk-marked square brackets enclose optional syntax choices separated by vertical bars, from which you select one choice, multiple choices, or none.
&<1-n>	The argument or keyword and argument combination before the ampersand (&) sign can be entered 1 to n times.
#	A line that starts with a pound (#) sign is comments.

GUI conventions

Convention	Description
Boldface	Window names, button names, field names, and menu items are in bold text. For example, the **New User** window appears; click **OK**.
>	Multi-level menus are separated by angle brackets. For example, **File** > **Create** > **Folder**.

Symbols

Convention	Description
⚠ WARNING	An alert that calls attention to important information that if not understood or followed can result in personal injury.
△ CAUTION	An alert that calls attention to important information that if not understood or followed can result in data loss, data corruption, or damage to hardware or software.
① IMPORTANT	An alert that calls attention to essential information.
NOTE	An alert that contains additional or supplementary information.
☀ TIP	An alert that provides helpful information.

Network topology icons

	Represents a generic network device, such as a router, switch, or firewall.
	Represents a routing-capable device, such as a router or Layer 3 switch.
	Represents a generic switch, such as a Layer 2 or Layer 3 switch, or a router that supports Layer 2 forwarding and other Layer 2 features.
	Represents an access controller, a unified wired-WLAN module, or the switching engine on a unified wired-WLAN switch.
	Represents an access point.
	Represents a security product, such as a firewall, a UTM, or a load-balancing or security card that is installed in a device.
	Represents a security card, such as a firewall card, a load-balancing card, or a NetStream card.

Port numbering in examples

The port numbers in this document are for illustration only and might be unavailable on your device.

Index