



H3C MSR Router Series

Comware 5 Layer 2 - LAN Switching

Command Reference

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Preface

This command reference describes the multicast configuration commands for Ethernet link aggregation, Port isolation, MSTP, VLAN, GVRP, LLDP, and so on.

This preface includes the following topics about the documentation:

- [Audience.](#)
- [Conventions.](#)
- [Documentation feedback.](#)

Audience

This documentation is intended for:

- Network planners.
- Field technical support and servicing engineers.
- Network administrators working with the routers.

Conventions

The following information describes the conventions used in the documentation.

Command conventions

Convention	Description
Boldface	Bold text represents commands and keywords that you enter literally as shown.
<i>Italic</i>	<i>Italic</i> 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 a minimum of 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 Boldface. For example, the New User window opens; 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.
 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

Convention	Description
	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 access controller engine on a unified wired-WLAN switch.
	Represents an access point.
	Represents a wireless terminator unit.
	Represents a wireless terminator.
	Represents a mesh access point.
	Represents omnidirectional signals.
	Represents directional signals.
	Represents a security product, such as a firewall, UTM, multiservice security gateway, or load balancing device.
	Represents a security module, such as a firewall, load balancing, NetStream, SSL VPN, IPS, or ACG module.

Examples provided in this document

Examples in this document might use devices that differ from your device in hardware model, configuration, or software version. It is normal that the port numbers, sample output, screenshots, and other information in the examples differ from what you have on your device.

Documentation feedback

You can e-mail your comments about product documentation to info@h3c.com.

We appreciate your comments.

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MAC address table configuration commands

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

This document covers only the static, dynamic, and destination blackhole MAC address entries.

display mac-address

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

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 ]
```

Views

Any view

Default command level

1: Monitor level

Parameters

blackhole: Displays destination blackhole MAC address entries.

vlan *vlan-id*: Specifies a VLAN by its ID 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.

Examples

```
# Display the MAC address 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	Ethernet1/1	AGING

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

Table 1 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: <ul style="list-style-type: none">• Config static—Static entry manually configured by the user.• Config dynamic—Dynamic entry manually configured by the user.• Learned—Entry learned by the device.• Blackhole—Destination blackhole entry.
PORT INDEX	Number of the port corresponding to the MAC address. Packets destined to this MAC address are sent out of this port. It is displayed as N/A for a blackhole MAC address entry.
AGING TIME(s)	Aging time: <ul style="list-style-type: none">• AGING—The entry is aging.• NOAGED—The entry does not age.
1 mac address(es) found	One MAC address entry is found.

Related commands

- **mac-address** (system view)
- **mac-address** (interface view)
- **mac-address timer**

display mac-address aging-time

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

Syntax

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

Views

Any view

Default command 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.

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.

Related commands

- **mac-address** (system view)
- **mac-address** (interface view)
- **mac-address timer**
- **display mac-address**

display mac-address mac-learning

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

Syntax

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

Views

Any view

Default command 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.

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
Ethernet1/1         enable
Ethernet1/2         enable
Ethernet1/3         enable
Ethernet1/4         enable
```

Table 2 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.

mac-address (interface view)

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.

Syntax

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

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

Default

No MAC address entry is configured.

Views

Layer 2 Ethernet interface view

Default command 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, entering "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. The value range for the *vlan-id* argument is 1 to 4094.

Usage guidelines

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

Examples

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

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

```
[Sysname] interface ethernet 1/1
```

```
[Sysname-Ethernet1/1] mac-address static 000f-e201-0101 vlan 2
```

Related commands

display mac-address

mac-address (system view)

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

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

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*

Default

No MAC address entry is configured.

Views

System view

Default command level

2: System level

Parameters

blackhole: Specifies destination blackhole MAC address entries. These entries do not age, but you can add or remove them. The packets whose destination MAC addresses match destination 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, entering "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. The value range for the *vlan-id* argument is 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.

Usage guidelines

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.

You can delete all the 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.

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

Examples

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

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

```
[Sysname] mac-address static 000f-e201-0101 interface ethernet 1/1 vlan 2
```

Related commands

display mac-address

mac-address mac-learning disable

Use **mac-address mac-learning disable** to disable MAC address learning on a Layer 2 Ethernet interface.

Use **undo mac-address mac-learning disable** to enable MAC address learning on a Layer 2 Ethernet interface.

Syntax

mac-address mac-learning disable

undo mac-address mac-learning disable

Default

MAC address learning is enabled.

Views

Layer 2 Ethernet interface view, port group view

Default command level

2: System level

Usage guidelines

Follow these guidelines when you configure MAC address learning:

- You can 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 might result in broadcast storms, enable broadcast storm suppression after you disable MAC address learning on a port.

The learned MAC addresses are removed after MAC address learning is disabled.

Examples

```
# Disable MAC address learning on port Ethernet 1/1.
```

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

```
[Sysname] interface ethernet 1/1
```

```
[Sysname-Ethernet1/1] mac-address mac-learning disable
```

Related commands

display mac-address mac-learning

mac-address max-mac-count

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

Use **mac-address max-mac-count disable-forwarding** to disable the device from forwarding frames with unknown source MAC addresses after the number of learned MAC addresses reaches the upper limit.

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

Use **undo mac-address max-mac-count disable-forwarding** to allow the device to forward frames received on an Ethernet port with unknown source MAC addresses after the number of learned MAC addresses reaches the upper limit.

Syntax

```
mac-address max-mac-count { count | disable-forwarding }
```

```
undo mac-address max-mac-count [ disable-forwarding ]
```

Default

The maximum number of MAC addresses that can be learned on a port varies with device models, and frames received are forwarded when the upper limit is reached.

Views

Layer 2 Ethernet interface view, port group view

Default command level

2: System level

Parameters

count: Sets the maximum number of MAC addresses that can be learned on a port. When the argument takes 0, the port is not allowed to learn MAC addresses.

The following matrix shows the *count* argument and hardware compatibility:

Hardware	Argument compatibility	Value range
MSR800	No	N/A
MSR 900	No	N/A
MSR900-E	No	N/A
MSR 930	No	N/A
MSR 20-1X	No	N/A
MSR 20	No	N/A
MSR 30	Supported only on an MIM-FSW module	<ul style="list-style-type: none">MSR 30-11E and MSR 30-11F: 0 to 8191Others: 0 to 4096
MSR 50	Supported only on an FIC-FSW module	0 to 4096
MSR 2600	Yes	<ul style="list-style-type: none">MSR 2600-10: 0 to 4096MSR 2600-17: 0 to 8192
MSR3600-51F	Supported only on an FIC-FSW module	0 to 8191

disable-forwarding: Disables the device from forwarding frames with unknown source MAC addresses after the number of learned MAC addresses reaches the upper limit. Frames with the source MAC addresses listed in the MAC address table are forwarded.

Usage guidelines

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

The following matrix shows the command and hardware compatibility:

Hardware	Command compatibility
MSR800	No
MSR 900	No
MSR900-E	No

Hardware	Command compatibility
MSR 930	No
MSR 20-1X	No
MSR 20	No
MSR 30	Supported only on an MIM-FSW module
MSR 50	Supported only on an FIC-FSW module
MSR 2600	Yes
MSR3600-51F	Supported only on an FIC-FSW module

Examples

Set the maximum number of MAC addresses that can be learned on port Ethernet 1/1 to 600. After this upper limit is reached, frames received with unknown source MAC addresses on the port are not forwarded.

```
<Sysname> system-view
[Sysname] interface ethernet 1/1
[Sysname-Ethernet1/1] mac-address max-mac-count 600
[Sysname-Ethernet1/1] mac-address max-mac-count disable-forwarding
```

Related commands

- **mac-address** (system view)
- **mac-address** (interface view)
- **mac-address timer**

mac-address timer

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

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

Syntax

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

undo mac-address timer aging

Default

The aging timer for dynamic MAC address entries is 300 seconds.

Views

System view

Default command level

2: System level

Parameters

aging *seconds*: Sets an aging timer for dynamic MAC address entries, in the range of 10 to 4080 seconds.

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

Usage guidelines

Follow these guidelines to set the aging timer appropriately:

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

Examples

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

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

```
[Sysname] mac-address timer aging 500
```

Layer 2 forwarding configuration commands

display mac-forwarding statistics

Use **display mac-forwarding statistics** to display Layer 2 forwarding statistics.

Syntax

```
display mac-forwarding statistics [ interface interface-type interface-number ] [ | { begin | exclude | include } regular-expression ]
```

Views

Any view

Default command level

1: Monitor level

Parameters

interface *interface-type interface-number*: Displays the statistics of an 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.

Usage guidelines

If no parameter is specified, Layer 2 forwarding statistics for all interfaces is displayed.

Examples

Display the Layer 2 forwarding statistics for all interfaces.

```
<Sysname> display mac-forwarding statistics
```

```
Total received: 888
```

```
Filtered:111      STP discarded:0
```

```
Broadcast:0      Multicast:0
```

```
Unknown Unicast:0 Invalid Tag:0
```

```
Total deliver to up: 111
```

```
L2 protocol:11 Local MAC address:100
```

```
Blackhole dropped:0
```

```
Total sent: 666
```

```
Filtered:0      STP discarded:0
```

Display forwarding statistics of Ethernet 1/1.

```
<Sysname> display mac-forwarding statistics interface ethernet 1/1
```

```
Ethernet 1/1:
```

```
Input frames:100      Input bytes:23
```

Output frames:100 Output bytes:23
 Filtered:0 Invalid Tag:0

Table 3 Command output

Field	Description
Total received	Total number of received Ethernet frames.
Filtered	Number of frames filtered out by 802.1Q Tagged VLAN inbound filtering rules.
STP discarded	Number of Ethernet frames dropped on the ingress ports blocked by STP.
Broadcast	Number of received broadcast frames.
Multicast	Number of received multicast frames.
Unknown unicast	Number of received unknown unicast frames.
Invalid Tag	Number of Ethernet frames dropped because of invalid tags. At present, Ethernet frames with the VLAN ID as 0 or 0xFFF are dropped.
Total deliver to up	Number of Ethernet frames delivered to upper layer protocols.
L2 protocol	Number of Layer 2 protocol frames delivered to the upper layer.
Local MAC address	Number of Ethernet frames with the destination being the MAC addresses of local Layer 3 interfaces.
Blackhole dropped	Number of frames dropped as they are destined to blackhole MAC addresses.
Total sent	Total number of sent Ethernet frames.
Filtered	Number of frames filtered out by the VLAN egress traffic filtering rule.
STP discarded	Number of Ethernet frames dropped on egress ports blocked by STP.
Input frames	Number of received Ethernet frames on the interface.
Output frames	Number of Ethernet frames sent from the interface.
Input bytes	Number of received bytes on the interface.
Output bytes	Number of bytes sent out of the interface.
Filtered	Number of Ethernet frames filtered out because they are from other VLANs.

reset mac-forwarding statistics

Use **reset mac-forwarding statistics** to clear all Layer 2 forwarding statistics.

Syntax

reset mac-forwarding statistics

Views

User view

Default command level

1: Monitor level

Examples

Clear all Layer 2 forwarding statistics.

```
<Sysname> reset mac-forwarding statistics
```

VLAN configuration commands

Basic VLAN configuration commands

bandwidth

Use **bandwidth** to set the expected bandwidth for a VLAN-interface.

Use **undo bandwidth** to cancel the configuration.

Syntax

bandwidth *bandwidth-value*

undo bandwidth

Views

VLAN-interface view

Default command level

2: System level

Parameters

bandwidth-value: Sets the expected bandwidth in the range of 1 to 4,294,967,295 kbps.

Usage guidelines

You can obtain the expected bandwidth of an interface by querying the ifspeed value of the MIB node with third-party software.

The expected bandwidth is used by network management systems for monitoring bandwidth, but does not affect the actual bandwidth of the interface.

Examples

```
# Set the expected bandwidth to 10,000 kbps for interface VLAN-interface 1.
```

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

```
[Sysname] interface vlan-interface 1
```

```
[Sysname-Vlan-interface1] bandwidth 10000
```

default

Use **default** to restore the default settings for a VLAN-interface.

Syntax

default

Views

VLAN-interface view

Default command level

2: System level

Usage guidelines

CAUTION:

The **default** command might interrupt ongoing network services. Make sure you are fully aware of the impacts of this command when you use it in 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 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

Use **description** to change the description of the VLAN or VLAN-interface.

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

Syntax

description *text*

undo description

Default

The description for a VLAN is **VLAN** *vlan-id*, which is the ID of the VLAN. For example, the default description of VLAN 100 is **VLAN 0100**. The default description for a VLAN-interface is the name of the interface. For example, the default description of VLAN-interface 1 is **Vlan-interface1 Interface**.

Views

VLAN view, VLAN-interface view

Default command level

2: System level

Parameters

text: Description for 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 and creating garbled characters at the end of a line.

Usage guidelines

Configure a description to describe the function or connection of a VLAN or VLAN-interface for easy management.

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
```

Related commands

- **display interface vlan-interface**
- **display vlan**

display interface vlan-interface

Use **display interface vlan-interface** to display information about a specified or all VLAN-interfaces.

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 ]
```

Views

Any view

Default command 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.

Usage guidelines

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.

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 4 Command output

Field	Description
Vlan-interface2 current state	Physical state of a VLAN-interface: <ul style="list-style-type: none">• DOWN (Administratively)—The administrative state of the VLAN-interface is down, because it has been shut down with the shutdown command.• DOWN—The administrative state of the VLAN-interface is up, but its physical state 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

Field	Description
	<p>have failed).</p> <ul style="list-style-type: none"> • UP—Both the administrative state and the physical state of the VLAN-interface are up.
Line protocol current state	<p>Link layer protocol state of a VLAN-interface:</p> <ul style="list-style-type: none"> • 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.
Last clearing of counters	<p>Time when the reset counters interface vlan-interface command was last used to clear the interface statistics.</p> <p>Never indicates the reset counters interface vlan-interface command has never been used on the interface after the device's startup.</p>
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	<p>Link layer state of an interface:</p> <ul style="list-style-type: none"> • 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. To see the main interface, use the display standby state command.
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	<p>Physical link state of the interface:</p> <ul style="list-style-type: none"> • UP—The link is up. • ADM—The link has been administratively shut down. To

Field	Description
	recover its physical state, perform the undo shutdown command.
Protocol	Protocol connection state of the interface: 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.

Related commands

reset counters interface vlan-interface

display vlan

Use **display vlan** to display VLAN information.

Syntax

```
display vlan [ vlan-id1 [ to vlan-id2 ] ] | all | dynamic | reserved | static ] [ | { begin | exclude | include } regular-expression ]
```

Views

Any view

Default command 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. *vlan-id2* must be no smaller than *vlan-id1*.

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 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.

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:
  Ethernet1/1 Ethernet1/2 Ethernet1/3

```

Display VLAN 3 information.

```

<Sysname> display vlan 3
VLAN ID: 3
  VLAN Type: static
  Route Interface: configured
  IP Address: 1.1.1.1
  Subnet Mask: 255.255.255.0
  Description: VLAN 0003
  Name: VLAN 0003
Tagged   Ports: none
Untagged Ports: none

```

Table 5 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.
IP Address	Primary IP address of the VLAN-interface. This is available only when an IP 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.
Subnet Mask	Subnet mask of the primary IP address. This is available only when an IP 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.

Related commands

vlan

interface vlan-interface

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.

Syntax

interface vlan-interface *vlan-interface-id*

undo interface vlan-interface *vlan-interface-id*

Views

System view

Default command level

2: System level

Parameters

vlan-interface-id: Specifies a VLAN-interface number in the range of 1 to 4094.

Usage guidelines

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.

Examples

```
# Create VLAN-interface 2, and enter its view.  
<Sysname> system-view  
[Sysname] vlan 2  
[Sysname-vlan2] quit  
[Sysname] interface vlan-interface 2  
[Sysname-Vlan-interface2]
```

Related commands

display interface vlan-interface

ip address

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.

Syntax

ip address *ip-address* { *mask* | *mask-length* } [**sub**]

undo ip address [*ip-address* { *mask* | *mask-length* } [**sub**]]

Default

No IP address is assigned to any VLAN-interface.

Views

VLAN-interface view

Default command 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.

Usage guidelines

To connect a VLAN to multiple subnets, assign one primary IP address and multiple secondary IP addresses to a VLAN-interface. The maximum number of IP addresses that can be assigned to a VLAN-interface is 512.

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.

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
```

Related commands

display ip interface (*Layer 3—IP Services Command Reference*)

mac-address

Use **mac-address** to assign a MAC address to a VLAN-interface.

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

Syntax

mac-address *mac-address*

undo mac-address

Views

VLAN-interface view

Default command level

2: System level

Parameters

mac-address: Specifies a MAC address in the format of H-H-H.

Usage guidelines

VLAN-interfaces are virtual interfaces that are manually created and removed. Upon creation, a VLAN-interface borrows the MAC address of a physical interface on the device. For this reason, all VLAN-interfaces on a device share the same MAC address. In some applications, to avoid MAC address collisions, use this command to set different MAC addresses for different VLAN-interfaces.

Examples

```
# Assign MAC address 0001-0001-0001 to VLAN-interface 11.
<Sysname> system-view
[Sysname] interface vlan-interface 11
[Sysname-Vlan-interface11] mac-address 1-1-1
```

mtu

Use **mtu** to set the MTU for a VLAN-interface.

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

Syntax

mtu *size*

undo mtu

Default

The MTU of a VLAN-interface is 1500 bytes.

Views

VLAN-interface view

Default command level

2: System level

Parameters

size: Sets the MTU in the range of 46 to 1500 bytes.

Examples

```
# Set the MTU to 1492 bytes for VLAN-interface 1.
```

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

```
[Sysname] interface vlan-interface 1
```

```
[Sysname-Vlan-interface1] mtu 1492
```

Related commands

display interface vlan-interface

name

Use **name** to configure a name for the VLAN.

Use **undo name** to restore the default name of the VLAN.

Syntax

name *text*

undo name

Default

The name of a VLAN is VLAN *vlan-id*, which is its VLAN ID. For example, the default name of VLAN 100 is **VLAN 0100**.

Views

VLAN view

Default command 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 (:), semi-colon (;) quotation marks ("), apostrophe ('), comma (,), dot (.), and slash (/), spaces, and other Unicode characters and symbols.

Usage guidelines

When 802.1X or MAC address authentication is configured on a router, 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 router.

Use VLAN names, rather than VLAN IDs, to distinguish a large number of VLANs.

Examples

```
# Configure the name of VLAN 2 as Test VLAN.
```

```
<Sysname> system-view
[Sysname] vlan 2
[Sysname-vlan2] name Test VLAN
```

Related commands

display vlan

reset counters interface vlan-interface

Use **reset counters interface vlan-interface** to clear the statistics on a VLAN-interface.

Syntax

```
reset counters interface vlan-interface [ vlan-interface-id ]
```

Views

User view

Default command level

2: System level

Parameters

vlan-interface-id: Specifies a VLAN-interface number.

Usage guidelines

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.

Examples

```
# Clear the statistics on VLAN-interface 2.
<Sysname> reset counters interface vlan-interface 2
```

Related commands

display interface vlan-interface

shutdown

Use **shutdown** to manually shut down a VLAN-interface.

Use **undo shutdown** to cancel the action of shutting down a VLAN-interface.

Syntax

shutdown
undo shutdown

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.

Views

VLAN-interface view

Default command level

2: System level

Usage guidelines

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 cancel the action of shutting it down.  
<Sysname> system-view  
[Sysname] interface vlan-interface 2  
[Sysname-Vlan-interface2] shutdown  
[Sysname-Vlan-interface2] undo shutdown
```

vlan

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 *vlan-id1* through *vlan-id2*, except reserved VLANs.

Use **vlan all** to create VLANs 1 through 4094.

Use **undo vlan** to remove the specified VLANs.

Syntax

vlan { *vlan-id1* [**to** *vlan-id2*] | **all** }
undo vlan { *vlan-id1* [**to** *vlan-id2*] | **all** }

Default

Only the default VLAN (VLAN 1) exists in the system.

Views

System view

Default command 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. *vlan-id2* must be no smaller than *vlan-id1*.

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 router is less than 4094.

The following matrix shows the **all** keyword and hardware compatibility:

Hardware	Keyword compatibility
MSR800	No
MSR 900	No
MSR900-E	No
MSR 930	No
MSR 20-1X	No
MSR 20	No
MSR 30	Yes
MSR 50	Yes
MSR 2600	Yes
MSR3600-51F	Yes

Usage guidelines

You cannot create or remove the default VLAN (VLAN 1).

You cannot create or remove VLANs reserved for specific functions.

To remove the following VLANs, 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

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.
```

Related commands

display vlan

Port-based VLAN configuration commands

display port

Use **display port** to display information about the hybrid or trunk ports on the device, including the port names, PVIDs, and allowed VLAN IDs.

Syntax

```
display port { hybrid | trunk } [ | { begin | exclude | include } regular-expression ]
```

Views

Any view

Default command 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.

Examples

Display information about the hybrid ports in the system.

```
<Sysname> display port hybrid
Interface          PVID  VLAN passing
Eth1/4             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
Eth1/8             2     1-4, 6-100, 145, 177, 189-200, 244, 289, 400,
                555, 600-611, 1000, 2006-2008
```

Table 6 Command output

Field	Description
Interface	Port name.
PVID	Port VLAN ID.
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

Use **port** to assign the specified access ports to the VLAN.

Use **undo port** to remove the specified access ports from the VLAN.

Syntax

port *interface-list*

undo port *interface-list*

Default

All ports are in VLAN 1. All ports are access ports. However, you can manually configure the port type. For more information, see "[port link-type](#)."

Views

VLAN view

Default command level

2: System level

Parameters

interface-list: Specifies an interface list, in the format 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 ports or port ranges.

Usage guidelines

This command is only applicable on access ports.

You cannot assign Layer 2 aggregate interfaces to a VLAN.

Examples

```
# Assign Ethernet 1/1 through Ethernet 1/3 to VLAN 2.
<Sysname> system-view
[Sysname] vlan 2
[Sysname-vlan2] port ethernet 1/1 to ethernet 1/3
```

Related commands

display vlan

port access vlan

Use **port access vlan** to assign the access ports to the specified VLAN.

Use **undo port access vlan** to restore the default.

Syntax

port access vlan *vlan-id*

undo port access vlan

Default

All access ports belong to VLAN 1 and do not belong to any other VLAN.

Views

Ethernet interface view, Layer 2 aggregate interface view

Default command level

2: System level

Parameters

vlan-id: Specifies a VLAN ID in the range of 1 to 4094. Make sure that the VLAN specified by the VLAN ID already exists.

Usage guidelines

The following matrix shows the command and hardware compatibility in Layer 2 aggregate interface view:

Hardware	Command compatibility
MSR800	Yes
MSR 900	No
MSR900-E	Yes
MSR 930	Yes
MSR 20-1X	No
MSR 20	No
MSR 30	Yes
MSR 50	Yes
MSR 2600	Yes
MSR3600-51F	Yes

The configuration made in Ethernet interface view applies only to the port.

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 Ethernet 1/1 to VLAN 3.

```
<Sysname> system-view
[Sysname] vlan 3
[Sysname-vlan3] quit
[Sysname] interface ethernet 1/1
[Sysname-Ethernet1/1] 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

Use **port hybrid pvid** to configure the PVID of the hybrid port.

Use **undo port hybrid pvid** to restore the default.

Syntax

port hybrid pvid vlan *vlan-id*

undo port hybrid pvid

Default

The PVID of a hybrid port is VLAN 1.

Views

Ethernet interface view, Layer 2 aggregate interface view

Default command level

2: System level

Parameters

vlan-id: Specifies a VLAN ID in the range of 1 to 4094.

Usage guidelines

The following matrix shows the command and hardware compatibility in Layer 2 aggregate interface view:

Hardware	Command compatibility
MSR800	Yes
MSR 900	No
MSR900-E	Yes
MSR 930	Yes
MSR 20-1X	No
MSR 20	No
MSR 30	Yes
MSR 50	Yes
MSR 2600	Yes
MSR3600-51F	Yes

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.

H3C 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 permit the packets from the PVID to pass through.

The configuration made in Ethernet interface view applies only to the port.

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

Configure VLAN 100 as the PVID of the hybrid port Ethernet 1/1.

```
<Sysname> system-view
[Sysname] vlan 100
[Sysname-vlan100] quit
[Sysname] interface ethernet 1/1
[Sysname-Ethernet1/1] port link-type hybrid
[Sysname-Ethernet1/1] 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
```

Related commands

- **port link-type**
- **port hybrid vlan**

port hybrid vlan

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.

Syntax

port hybrid vlan *vlan-list* { **tagged** | **untagged** }

undo port hybrid vlan *vlan-list*

Default

A hybrid port only allows packets from VLAN 1 to pass through untagged.

Views

Ethernet interface view, Layer 2 aggregate interface view

Default command level

2: System level

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, *vlan-id2* must be no smaller than *vlan-id1*, and &<1-10> indicates that you can specify up to 10 VLAN IDs or VLAN ID ranges. Make sure that the specified VLANs already exist.

tagged: Configures the ports to send the tagged packets of the specified VLANs.

untagged: Configures the ports to send the untagged packets of the specified VLANs.

Usage guidelines

The following matrix shows the command and hardware compatibility in Layer 2 aggregate interface view:

Hardware	Command compatibility
MSR800	Yes
MSR 900	No
MSR900-E	Yes
MSR 930	Yes
MSR 20-1X	No
MSR 20	No
MSR 30	Yes
MSR 50	Yes
MSR 2600	Yes
MSR3600-51F	Yes

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 Ethernet interface view applies only to the port.

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 the hybrid port Ethernet 1/1 to VLAN 2, VLAN 4, and VLAN 50 through VLAN 100, and configure Ethernet 1/1 to send packets of these VLANs with tags kept.

```
<Sysname> system-view
[Sysname] interface ethernet 1/1
[Sysname-Ethernet1/1] port link-type hybrid
[Sysname-Ethernet1/1] 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 ethernet 1/1 to ethernet 1/6
[Sysname-port-group-manual-2] port link-type hybrid
[Sysname-port-group-manual-2] port hybrid vlan 2 untagged

Configuring Ethernet1/1... Done.
Configuring Ethernet1/2... Done.
Configuring Ethernet1/3... Done.
Configuring Ethernet1/4... Done.
Configuring Ethernet1/5... Done.
Configuring Ethernet1/6... 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 Ethernet1/1... Done.
Configuring Ethernet1/2... Done.
Configuring Ethernet1/3... Done.

```

The output shows that Ethernet 1/1, Ethernet 1/2, and Ethernet 1/3 are the member ports of the aggregation group corresponding to Bridge-Aggregation 1.

Related commands

port link-type

port link-type

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.

Syntax

port link-type { **access** | **hybrid** | **trunk** }

undo port link-type

Default

Any port is an access port.

Views

Ethernet interface view, Layer 2 aggregate interface view

Default command 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.

Usage guidelines

The following matrix shows the command and hardware compatibility in Layer 2 aggregate interface view:

Hardware	Command compatibility
MSR800	Yes
MSR 900	No
MSR900-E	Yes
MSR 930	Yes
MSR 20-1X	No
MSR 20	No
MSR 30	Yes

Hardware	Command compatibility
MSR 50	Yes
MSR 2600	Yes
MSR3600-51F	Yes

To change the link type of a port from trunk to hybrid or vice versa, you must first set the link type to access.

If an access port on an MSR 2600-10 router is configured with the IP source guard binding feature, you cannot configure the link type of this port as trunk or hybrid. For more information about IP source guard binding, see "Configuring IP source guard."

The configuration made in Ethernet interface view applies only to the port.

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

Configure Ethernet 1/1 as a trunk port.

```
<Sysname> system-view
[Sysname] interface ethernet 1/1
[Sysname-Ethernet1/1] 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 ethernet 1/1
[Sysname-port-group manual group1] group-member ethernet 1/2
[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

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.

Syntax

```
port trunk permit vlan { vlan-list | all }
```

```
undo port trunk permit vlan { vlan-list | all }
```

Default

A trunk port allows only packets from VLAN 1 to pass through.

Views

Ethernet interface view, Layer 2 aggregate interface view

Default command 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, *vlan-id2* must be no smaller than *vlan-id1*, and <1-10> indicates that you can specify up to 10 VLAN IDs or VLAN ID ranges. Make sure that the specified VLANs already exist.

all: Permits all VLANs to pass through the trunk ports.

Usage guidelines

The following matrix shows the command and hardware compatibility in Layer 2 aggregate interface view:

Hardware	Command compatibility
MSR800	Yes
MSR 900	No
MSR900-E	Yes
MSR 930	Yes
MSR 20-1X	No
MSR 20	No
MSR 30	Yes
MSR 50	Yes
MSR 2600	Yes
MSR3600-51F	Yes

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 on super VLANs or 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.

To prevent unauthorized VLAN users from accessing restricted resources, use the **port trunk permit vlan all** command with caution.

The configuration made in Ethernet interface view applies only to the port.

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 the trunk port Ethernet 1/1 to VLAN 2, VLAN 4, and VLAN 50 through VLAN 100.

```
<Sysname> system-view
[Sysname] interface ethernet 1/1
[Sysname-Ethernet1/1] port link-type trunk
```

```
[Sysname-Ethernet1/1] 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 Ethernet1/1... Done.
Configuring Ethernet1/2... Done.
Configuring Ethernet1/3... Done.
```

The output shows that Ethernet 1/1, Ethernet 1/2, and Ethernet 1/3 are the member ports of the aggregation group corresponding to Bridge-Aggregation 1.

Related commands

port link-type

port trunk pvid

Use **port trunk pvid** to configure the PVID for the trunk port.

Use **undo port trunk pvid** to restore the default.

Syntax

port trunk pvid vlan *vlan-id*

undo port trunk pvid

Default

The PVID of a trunk port is VLAN 1.

Views

Ethernet interface view, Layer 2 aggregate interface view

Default command level

2: System level

Parameters

vlan-id: Specifies a VLAN ID in the range of 1 to 4094.

Usage guidelines

The following matrix shows the command and hardware compatibility in Layer 2 aggregate interface view:

Hardware	Command compatibility
MSR800	Yes
MSR 900	No
MSR900-E	Yes
MSR 930	Yes
MSR 20-1X	No
MSR 20	No

Hardware	Command compatibility
MSR 30	Yes
MSR 50	Yes
MSR 2600	Yes
MSR3600-51F	Yes

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 trunk port, it does not affect the setting of the PVID on the port.

The local and remote trunk ports must use the same PVID for the traffic of the PVID to be transmitted correctly.

You must use the **port trunk permit vlan** command to configure the trunk port to allow and forward packets from the PVID.

The configuration made in Ethernet interface view applies only to the port.

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

Configure VLAN 100 as the PVID of the trunk port Ethernet 1/1, and assign Ethernet 1/1 to VLAN 100.

```
<Sysname> system-view
[Sysname] interface ethernet 1/1
[Sysname-Ethernet1/1] port link-type trunk
[Sysname-Ethernet1/1] port trunk pvid vlan 100
[Sysname-Ethernet1/1] port trunk permit vlan 100
```

Configure VLAN 100 as the PVID of the trunk Layer 2 aggregate interface Bridge-Aggregation 1, and assign Bridge-Aggregation 1 to VLAN 100.

```
<Sysname> system-view
[Sysname] interface bridge-aggregation 1
[Sysname-Bridge-Aggregation1] port link-type trunk
[Sysname-Bridge-Aggregation1] port trunk pvid vlan 100
[Sysname-Bridge-Aggregation1] port trunk permit vlan 100
```

Related commands

- **port link-type**
- **port trunk permit vlan**

Super VLAN configuration commands

The following matrix shows the super VLAN configuration commands and hardware compatibility:

Hardware	Super VLAN compatibility
MSR800	No
MSR 900	No
MSR900-E	No
MSR 930	No
MSR 20-1X	No
MSR 20	No
MSR 30	Available only on fixed Layer 2 Ethernet interfaces of MSR 30-11E and MSR 30-11F routers and on MSR 30-10 and MSR 30-11 routers installed with XMIM Layer 2 switching modules.
MSR 50	No
MSR 2600	No
MSR3600-51F	Yes

display supervlan

Use **display supervlan** to display the mapping between a super VLAN and sub-VLANs, and to display information about these VLANs.

Syntax

```
display supervlan [ supervlan-id ] [ [ { begin | exclude | include } regular-expression ]
```

Views

Any view

Default command level

1: Monitor level

Parameters

supervlan-id: Specifies a super 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.

Examples

Display the mapping between a super VLAN and sub-VLANs.

```
<Sysname> display supervlan 2
Supervlan ID : 2
```

Subvlan ID : 3-5

VLAN ID: 2
VLAN Type: static
It is a Super VLAN.
Route Interface: configured
IP Address: 10.153.17.41
Subnet Mask: 255.255.252.0
Description: VLAN 0002
Name: VLAN 0002
Tagged Ports: none
Untagged Ports: none

VLAN ID: 3
VLAN Type: static
It is a Sub VLAN.
Route Interface: not configured
Description: VLAN 0003
Name: VLAN 0003
Tagged Ports: none
Untagged Ports:
 Ethernet1/3

VLAN ID: 4
VLAN Type: static
It is a Sub VLAN.
Route Interface: not configured
Description: VLAN 0004
Name: VLAN 0004
Tagged Ports: none
Untagged Ports:
 Ethernet1/4

VLAN ID: 5
VLAN Type: static
It is a Sub VLAN.
Route Interface: not configured
Description: VLAN 0005
Name: VLAN 0005
Tagged Ports: none
Untagged Ports:
 Ethernet1/5

Table 7 Command output

Field	Description
Supervlan ID	Super VLAN ID.
Subvlan ID	Sub-VLAN ID.
VLAN Type	VLAN type (static or dynamic).

Field	Description
Route Interface	Indicates whether a VLAN-interface is configured or not for the sub-VLAN or super VLAN.
IP Address	IP address of the VLAN-interface configured for the sub-VLAN or super VLAN.
Subnet Mask	Subnet mask of the VLAN-interface configured for the sub-VLAN or super VLAN.
Description	VLAN description.
Name	VLAN name.
Tagged Ports	Ports through which VLAN packets are sent tagged.
Untagged Ports	Ports through which VLAN packets are sent untagged.

Related commands

- **supervlan**
- **subvlan**

subvlan

Use **subvlan** to associate the super VLAN with sub-VLANs specified by *vlan-list*.

Use **undo subvlan** to remove the association.

Syntax

subvlan *vlan-list*

undo subvlan [*vlan-list*]

Views

VLAN view

Default command level

2: System level

Parameters

vlan-list: Specifies a sub-VLAN list, in the format of *vlan-list* = { *vlan-id1* [**to** *vlan-id2*] }&<1-10>, where *vlan-id* represents the sub-VLAN ID in the range of 1 to 4094 and &<1-10> indicates that you can specify up to 10 sub-VLAN IDs or sub-VLAN ID ranges.

Usage guidelines

Verify that the sub-VLANs already exist before associating them with a super VLAN.

You can add/remove a port to/from a sub-VLAN already associated with a super VLAN.

If you use the **undo subvlan** command without *vlan-list* specified, you will remove the association between the specified super VLAN and all its sub-VLANs.

If you use the **undo subvlan** command with *vlan-list* specified, you will remove only the association between the super VLAN and the sub-VLANs specified by *vlan-list*.

Examples

```
# Associate VLAN 10 (the super VLAN) with VLAN 3, VLAN 4, VLAN 5, and VLAN 9 (the sub-VLANs).
```

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

```
[Sysname] vlan 10
```

```
[Sysname-vlan10] subvlan 3 to 5 9
```

Related commands

display supervlan

supervlan

Use **supervlan** to configure the VLAN as a super VLAN.

Use **undo supervlan** to remove the super VLAN configuration for the VLAN.

Syntax

supervlan

undo supervlan

Views

VLAN view

Default command level

2: System level

Usage guidelines

You cannot configure a super VLAN as the guest VLAN for a port, and vice versa. For more information about guest VLANs, see *Security Configuration Guide*.

You can configure Layer 2 multicast for a super VLAN. However, the configuration cannot take effect.

You can configure DHCP, Layer 3 multicast, dynamic routing, and NAT for the VLAN-interface of a super VLAN. However, only DHCP can take effect.

H3C recommends not configuring VRRP for the VLAN-interface of a super VLAN, because the configuration affects network performance.

Examples

Configure VLAN 2 as a super VLAN.

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

```
[Sysname] vlan 2
```

```
[Sysname-vlan2] supervlan
```

Related commands

display supervlan

Voice VLAN configuration commands

The following matrix shows the voice VLAN configuration commands and hardware compatibility:

Hardware	Voice VLAN compatibility
MSR800	No
MSR 900	No
MSR900-E	No
MSR 930	No
MSR 20-1X	No
MSR 20	No
MSR 30	Available only on fixed Layer 2 Ethernet interfaces of MSR 30-11E and MSR 30-11F routers and on routers installed with MIM and XMIM Layer 2 switching modules.
MSR 50	Available only on routers installed with FIC Layer 2 Ethernet switching modules.
MSR 2600	Yes
MSR3600-51F	Yes

display voice vlan oui

Use **display voice vlan oui** to display the supported organizationally unique identifier (OUI) addresses, the OUI address masks, and the description strings.

Syntax

```
display voice vlan oui [ | { begin | exclude | include } regular-expression ]
```

Views

Any view

Default command 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.

Usage guidelines

OUI addresses in this document 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.

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
0060-b900-0000   ffff-ff00-0000   Philips/NEC phone
00d0-1e00-0000   ffff-ff00-0000   Pingtel phone
00e0-7500-0000   ffff-ff00-0000   Polycom phone
00e0-bb00-0000   ffff-ff00-0000   3com phone
```

Table 8 Command output

Field	Description
Oui Address	OUI addresses supported.
Mask	Masks of the OUI addresses supported.
Description	Description strings of the OUI addresses supported.

Related commands

voice vlan mac-address

display voice vlan state

Use **display voice vlan state** to display voice VLAN configuration.

Syntax

```
display voice vlan state [ | { begin | exclude | include } regular-expression ]
```

Views

Any view

Default command 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.

Examples

```
# Display voice VLAN configurations.
```

```
<Sysname> display voice vlan state
Maximum of Voice VLANs: 128
Current Voice VLANs: 2
Voice VLAN security mode: Security
Voice VLAN aging time: 1440 minutes
```

```

Voice VLAN enabled port and its mode:
PORT                VLAN        MODE
-----
Ethernet1/1         2          AUTO
Ethernet1/2         3          AUTO

```

Table 9 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.
Voice VLAN security mode	Security mode of the voice VLAN: Security for security mode; Normal for 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.

Related commands

- **voice vlan enable**
- **voice vlan qos**
- **voice vlan qos trust**

voice vlan aging

Use **voice vlan aging** to configure the voice VLAN aging time.

Use **undo voice vlan aging** to restore the default.

Syntax

voice vlan aging *minutes*

undo voice vlan aging

Default

The voice VLAN aging time is 1440 minutes.

Views

System view

Default command level

2: System level

Parameters

minutes: Sets the voice VLAN aging time in the range of 5 to 43200 minutes.

Usage guidelines

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.

Examples

```
# Configure the voice VLAN aging time as 100 minutes.
<Sysname> system-view
[Sysname] voice vlan aging 100
```

Related commands

display voice vlan state

voice vlan enable

Use **voice vlan enable** to enable the voice VLAN feature and to 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.

Syntax

```
voice vlan vlan-id enable
undo voice vlan [vlan-id] enable
```

Default

The voice VLAN feature is disabled on ports.

Views

Ethernet interface view

Default command level

2: System level

Parameters

vlan-id: Specifies a VLAN ID in the range of 2 to 4096.

Usage guidelines

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 Ethernet 1/1.
<Sysname> system-view
[Sysname] interface ethernet 1/1
[Sysname-Ethernet1/1] voice vlan 2 enable
```

voice vlan mac-address

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.

Syntax

```
voice vlan mac-address mac-address mask oui-mask [description text]
undo voice vlan mac-address oui
```

Default

The system is configured with the default OUI addresses. You can remove the default OUI addresses, and then add recognizable OUI addresses manually.

Table 10 Default OUI addresses

Number	OUI address	Vendor
1	0001-E300-0000	Siemens phone
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

Views

System view

Default command 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.

Usage guidelines

The system supports up to 16 OUI addresses.

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
```

Related commands

display voice vlan oui

voice vlan mode auto

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.

Syntax

voice vlan mode auto
undo voice vlan mode auto

Default

A port operates in automatic voice VLAN assignment mode.

Views

Ethernet interface view

Default command level

2: System level

Usage guidelines

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, manually assign the port to the voice VLAN.

Examples

```
# Configure Ethernet 1/1 to operate in manual voice VLAN assignment mode.  
<Sysname> system-view  
[Sysname] interface ethernet 1/1  
[Sysname-Ethernet1/1] undo voice vlan mode auto
```

voice vlan security enable

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.

Syntax

voice vlan security enable
undo voice vlan security enable

Default

The voice VLAN security mode is enabled.

Views

System view

Default command level

2: System level

Usage guidelines

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
```

Spanning tree configuration commands

active region-configuration

Use **active region-configuration** to activate your MST region configuration.

Syntax

active region-configuration

Views

MST region view

Default command level

2: System level

Usage guidelines

When you configure MST region-related parameters, MSTP launches a new spanning tree calculation process that might cause network topology instability. This is most likely to occur when you configure the VLAN-to-instance mapping table. The launch will occur only after you activate the MST region-related parameters by using the **active region-configuration** command or enable the spanning tree feature by using the **stp enable** command.

H3C 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.

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
```

Related commands

- **instance**
- **region-name**
- **revision-level**
- **vlan-mapping modulo**
- **check region-configuration**

check region-configuration

Use **check region-configuration** to display MST region pre-configuration information, including the region name, revision level, and VLAN-to-instance mapping settings.

Syntax

check region-configuration

Views

MST region view

Default command level

2: System level

Usage guidelines

Two or more spanning tree devices belong to the same MST region only if they are configured with the same format selector (0 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 through a physical link.

H3C 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.

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 :0x41b5018aca57daa8dcfdbba2984d99d06

Instance  Vlans Mapped
  0        1 to 9, 11 to 4094
  15       10
```

Table 11 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.

Related commands

- **instance**
- **region-name**
- **revision-level**
- **vlan-mapping modulo**
- **active region-configuration**

display stp

Use **display stp** to display the spanning tree status and statistics information.

Syntax

```
display stp [ instance instance-id ] [ interface interface-list ] [ brief ] [ [ { begin | exclude | include } regular-expression ]
```

Views

Any view

Default command level

1: Monitor level

Parameters

instance *instance-id*: Displays the status and statistics information of a specific MSTI. The minimum value of *instance-id* is 0, representing the CIST, and the maximum value of *instance-id* is 15.

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.

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.

Usage guidelines

Based on the spanning tree status and statistics information, you can analyze and maintain the network topology or check whether spanning tree is operating correctly.

In STP or RSTP mode:

- 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:

- 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.

Examples

In MSTP mode, display the brief spanning tree status and statistics information of MSTI 0 on ports Ethernet 1/1 through Ethernet 1/4.

```
<Sysname> display stp instance 0 interface ethernet 1/1 to ethernet 1/4 brief
```

MSTID	Port	Role	STP State	Protection
0	Ethernet1/1	ALTE	DISCARDING	LOOP
0	Ethernet1/2	DESI	FORWARDING	NONE
0	Ethernet1/3	DESI	FORWARDING	NONE

Table 12 Command output

Field	Description
MSTID	MSTI ID in the MST region.
Port	Port name, corresponding to each MSTI.
Role	Port role: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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 information 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(Ethernet1/1)][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

```

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 13 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 Times	Major parameters for the bridge: <ul style="list-style-type: none"> • 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).

Field	Description
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.
Time since last TC	Time after the latest topology change in the MSTI.
[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. <ul style="list-style-type: none"> • 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. <ul style="list-style-type: none"> • Config—Configured value. • Active—Actual value.
Point-to-point	The port is connected to a point-to-point link or not. <ul style="list-style-type: none"> • Config—Configured value. • Active—Actual value.
Transmit Limit	Maximum number of packets sent within each hello time.
Protection Type	Protection type on the port: <ul style="list-style-type: none"> • 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. <ul style="list-style-type: none"> • 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.
Num of Vlans Mapped	Number of VLANs mapped to the MSTI.

Field	Description
PortTimes	Major parameters for the port: <ul style="list-style-type: none"> • 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, 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.
Max age(s)	Aging timer (in seconds) for BPDUs.
Forward delay(s)	Port state transition delay (in seconds).
Hello time(s)	Interval (in seconds) for the root bridge to send BPDUs.
Max hops	Maximum hops in the MSTI.

Related commands

reset stp

display stp abnormal-port

Use **display stp abnormal-port** to display information about ports blocked by spanning tree protection functions.

Syntax

```
display stp abnormal-port [ | { begin | exclude | include } regular-expression ]
```

Views

Any view

Default command 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.

Examples

In MSTP mode, display information about ports blocked by spanning tree protection functions.

```
<Sysname> display stp abnormal-port
```

MSTID	Blocked Port	Reason
1	Ethernet1/1	ROOT-Protected
2	Ethernet1/2	LOOP-Protected
2	Ethernet1/3	Formatcompatibility-Protected

Table 14 Command output

Field	Description
Blocked Port	Name of a blocked port, which corresponds to the related MSTI.
Reason	Reason the port was blocked: <ul style="list-style-type: none">• ROOT-Protected—Root guard function.• LOOP-Protected—Loop guard function.• Formatcompatibility-Protected—MSTP BPDU format incompatibility protection function.

display stp bpdu-statistics

Use **display stp bpdu-statistics** to display the BPDU statistics on ports.

Syntax

```
display stp bpdu-statistics [ interface interface-type interface-number [ instance instance-id ] ] [ { begin | exclude | include } regular-expression ]
```

Views

Any view

Default command 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 minimum value of *instance-id* is 0, representing the CIST, and the maximum value is 15.

]: 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.

Usage guidelines

In MSTP mode:

- 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 or RSTP mode:

- 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 Ethernet 1/1.

```
<Sysname> display stp bpdu-statistics interface ethernet 1/1
Port: Ethernet1/1
```

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

```

Table 15 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.
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

Use **display stp down-port** to display information about ports shut down by spanning tree protection functions.

Syntax

```
display stp down-port [ | { begin | exclude | include } regular-expression ]
```

Views

Any view

Default command 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.

Examples

Display information about ports shut down by spanning tree protection functions.

```
<Sysname> display stp down-port
Down Port          Reason
Ethernet1/1       BPDU-Protected
Ethernet1/2       Formatfrequency-Protected
```

Table 16 Command output

Field	Description
Down Port	Name of a port shut down by the spanning tree protection functions.
Reason	Reason the port was shut down: <ul style="list-style-type: none">• BPDU-Protected—BPDU guard function.• Formatfrequency-Protected—MSTP BPDU format frequent change protection function.

display stp history

Use **display stp history** to display the historical port role calculation information for the specified MSTI or all MSTIs.

Syntax

```
display stp [ instance instance-id ] history [ | { begin | exclude | include } regular-expression ]
```

Views

Any view

Default command level

0: Visit level

Parameters

instance *instance-id*: Displays the historical port role calculation information for a specific MSTI. The minimum value of *instance-id* is 0, representing the CIST, and the maximum value of *instance-id* is 15.

|: 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.

Usage guidelines

In STP or RSTP mode, the displayed information is sorted by port role calculation time.

In MSTP mode:

- If you do not specify any MSTI, this command displays the historical port role calculation information for 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 for the specified MSTI by the sequence of port role calculation time.

Examples

In MSTP mode, display the historical port role calculation information for MSTI 2.

```
<Sysname> display stp instance 2 history
----- Instance 2 -----
Port Ethernet1/1
  Role change   : ROOT->DESI (Aged)
  Time          : 2010/02/08 00:22:56
  Port priority : 0.00e0-fc01-6510 0 0.00e0-fc01-6510 128.1
Port Ethernet1/2
  Role change   : ALTER->ROOT
  Time          : 2010/02/08 00:22:56
  Port priority : 0.00e0-fc01-6510 0 0.00e0-fc01-6510 128.2
```

Table 17 Command output

Field	Description
Port	Port name.
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

Use **display stp region-configuration** to display the effective configuration information of the MST region, including the region name, revision level, and user-configured VLAN-to-instance mappings.

Syntax

```
display stp region-configuration [ | { begin | exclude | include } regular-expression ]
```

Views

Any view

Default command 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.

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
```

Table 18 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.

Related commands

- **instance**
- **region-name**
- **revision-level**
- **vlan-mapping modulo**

display stp root

Use **display stp root** to display the root bridge information of all MSTIs.

Syntax

```
display stp root [ | { begin | exclude | include } regular-expression ]
```

Views

Any view

Default command 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.

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             Ethernet1/1
```

Table 19 Command output

Field	Description
ExtPathCost	External path cost. The device automatically calculates the default path cost of a port. Otherwise, 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. Otherwise, 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

Use **display stp tc** to display the statistics of TC/TCN BPDUs received and sent by all ports in an MSTI or all MSTIs.

Syntax

```
display stp [ instance instance-id ] tc [ | { begin | exclude | include } regular-expression ]
```

Views

Any view

Default command 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 minimum value of *instance-id* is 0, representing the CIST, and the maximum value of *instance-id* is 15.

|: 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.

Usage guidelines

In STP or 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.

Examples

In MSTP mode, display the statistics of TC/TCN BPDUs received and sent by all ports in MSTI 0.

```
<Sysname> display stp instance 0 tc
```

MSTID	Port	Receive	Send
0	Ethernet1/1	6	4
0	Ethernet1/2	0	2

Table 20 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

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).

Syntax

```
instance instance-id vlan vlan-list
```

```
undo instance instance-id [vlan vlan-list]
```

Default

All VLANs are mapped to the CIST.

Views

MST region view

Default command level

2: System level

Parameters

instance-id: Specifies an MSTI ID. The minimum value is 0, representing the CIST, and the maximum value is 15.

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.

Usage guidelines

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.

After configuring this command, run the **active region-configuration** command to activate the VLAN-to-instance mapping.

Examples

```
# Map VLAN 2 to MSTI 1.
<Sysname> system-view
[Sysname] stp region-configuration
[Sysname-mst-region] instance 1 vlan 2
```

Related commands

- **display stp region-configuration**
- **check region-configuration**
- **active region-configuration**

region-name

Use **region-name** to configure the MST region name.

Use **undo region-name** to restore the default MST region name.

Syntax

```
region-name name
undo region-name
```

Default

The MST region name of a device is its MAC address.

Views

MST region view

Default command level

2: System level

Parameters

name: Specifies the MST region name, a string of 1 to 32 characters.

Usage guidelines

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.

Examples

```
# Set the MST region name of the device to hello.
<Sysname> system-view
[Sysname] stp region-configuration
[Sysname-mst-region] region-name hello
```

Related commands

- **instance**
- **revision-level**
- **vlan-mapping modulo**
- **display stp region-configuration**
- **check region-configuration**
- **active region-configuration**

reset stp

Use **reset stp** to clear the MSTP statistics information.

Syntax

```
reset stp [ interface interface-list ]
```

Views

User view

Default command 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. If you don't specify this option, the command clears the spanning tree-related statistics on all ports.

Usage guidelines

The MSTP statistics information includes the numbers of TCN BPDUs, configuration BPDUs, RST BPDUs and MST BPDUs sent/received through the specified ports.

Examples

```
# Clear the spanning tree-related statistics on ports Ethernet 1/1 through Ethernet 1/3.  
<Sysname> reset stp interface ethernet 1/1 to ethernet 1/3
```

Related commands

display stp

revision-level

Use **revision-level** to configure the MSTP revision level.

Use **undo revision-level** to restore the default MSTP revision level.

Syntax

```
revision-level level  
undo revision-level
```

Default

The MSTP revision level is 0.

Views

MST region view

Default command level

2: System level

Parameters

level: Specifies an MSTP revision level in the range of 0 to 65535.

Usage guidelines

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.

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
```

Related commands

- **instance**
- **region-name**
- **vlan-mapping modulo**
- **display stp region-configuration**
- **check region-configuration**
- **active region-configuration**

stp bpdu-protection

Use **stp bpdu-protection** to enable the BPDU guard function.

Use **undo stp bpdu-protection** to disable the BPDU guard function.

Syntax

```
stp bpdu-protection
```

```
undo stp bpdu-protection
```

Default

The BPDU guard function is disabled.

Views

System view

Default command level

2: System level

Examples

```
# Enable the BPDU guard function.
```

```
<Sysname> system-view  
[Sysname] stp bpdu-protection
```

stp bridge-diameter

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.

Syntax

stp bridge-diameter *diameter*

undo stp bridge-diameter

Default

The network diameter of the switched network is 7.

Views

System view

Default command level

2: System level

Parameters

diameter: Specifies the switched network diameter in the range of 2 to 7.

Usage guidelines

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.

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), not on other MSTIs.

Examples

```
# In MSTP mode, set the network diameter of the switched network to 5.
```

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

```
[Sysname] stp bridge-diameter 5
```

Related commands

- **stp timer forward-delay**
- **stp timer hello**
- **stp timer max-age**

stp compliance

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.

Syntax

stp compliance { **auto** | **dot1s** | **legacy** }

undo stp compliance

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.

Views

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

Default command 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.

Usage guidelines

The following matrix shows the command and hardware compatibility:

Hardware	Command compatibility in Layer 2 aggregate interface view
MSR800	Yes
MSR 900	No
MSR900-E	Yes
MSR 930	Yes
MSR 20-1X	No
MSR 20	No
MSR 30	Yes
MSR 50	Yes
MSR 2600	Yes
MSR3600-51F	Yes

Configured in Ethernet interface view, the setting takes effect only on that 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.

Examples

Configure Ethernet 1/1 to receive and send only standard-format (802.1s) MSTP packets.

```
<Sysname> system-view
[Sysname] interface ethernet 1/1
[Sysname-Ethernet1/1] stp compliance dot1s
```

stp config-digest-snooping

Use **stp config-digest-snooping** to enable Digest Snooping.

Use **undo stp config-digest-snooping** to disable Digest Snooping.

Syntax

stp config-digest-snooping

undo stp config-digest-snooping

Default

The feature is disabled by default.

Views

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

Default command level

2: System level

Usage guidelines

The following matrix shows the command and hardware compatibility:

Hardware	Command compatibility in Layer 2 aggregate interface view
MSR800	Yes
MSR 900	No
MSR900-E	Yes
MSR 930	Yes
MSR 20-1X	No
MSR 20	No
MSR 30	Yes
MSR 50	Yes
MSR 2600	Yes
MSR3600-51F	Yes

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 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.

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.

When Digest Snooping is globally enabled, if you modify the VLAN-to-instance mapping or use the **undo stp region-configuration** command to restore the default MST region configuration, traffic might be interrupted because the local VLAN-to-instance mapping is different from that on a neighbor device. Perform these operations with caution.

Examples

```
# Enable Digest Snooping on Ethernet 1/1 and then globally.
<Sysname> system-view
[Sysname] interface ethernet 1/1
[Sysname-Ethernet1/1] stp config-digest-snooping
[Sysname-Ethernet1/1] quit
[Sysname] stp config-digest-snooping
```

Related commands

display stp

stp cost

Use **stp cost** to set the path cost of the port or ports.

Use **undo stp cost** to restore the default.

Syntax

stp [instance *instance-id*] cost *cost*

undo stp [instance *instance-id*] cost

Default

The device automatically calculates the path costs of ports in each spanning tree based on the corresponding standard.

Views

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

Default command level

2: System level

Parameters

instance *instance-id*: Sets the path cost of the ports in a particular MSTI. The minimum value of *instance-id* is 0, representing the CIST, and the maximum value of *instance-id* is 15.

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 value range for the *cost* argument is 1 to 65535.
- With the IEEE 802.1t standard selected for path cost calculation, the value range for the *cost* argument is 1 to 200000000.
- With the private standard selected for path cost calculation, the value range for the *cost* argument is 1 to 200000.

Usage guidelines

The following matrix shows the command and hardware compatibility:

Hardware	Command compatibility in Layer 2 aggregate interface view
MSR800	Yes
MSR 900	No
MSR900-E	Yes

Hardware	Command compatibility in Layer 2 aggregate interface view
MSR 930	Yes
MSR 20-1X	No
MSR 20	No
MSR 30	Yes
MSR 50	Yes
MSR 2600	Yes
MSR3600-51F	Yes

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.

To set the path cost of an MSTP port in a specific MSTI, use this command with the MSTI specified.

Path cost is an important factor in spanning tree calculation. Setting different path costs for a port in MSTIs allows different VLAN traffic flows to be forwarded along different physical links and enables 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 re-calculates the role of the port and initiates a state transition.

Examples

In MSTP mode, set the path cost of port Ethernet 1/3 in MSTI 2 to 200.

```
<Sysname> system-view
[Sysname] interface ethernet 1/3
[Sysname-Ethernet1/3] stp instance 2 cost 200
```

Related commands

- **display stp**
- **stp pathcost-standard**

stp edged-port

Use **stp edged-port enable** to configure one or more ports as edge ports.

Use **stp edged-port disable** to configure one or more ports as non-edge ports.

Use **undo stp edged-port** to restore the default.

Syntax

stp edged-port { enable | disable }

undo stp edged-port

Default

All ports are non-edge ports.

Views

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

Default command level

2: System level

Parameters

enable: Configures one or more ports as edge ports.

disable: Configures one or more ports as non-edge ports.

Usage guidelines

The following matrix shows the command and hardware compatibility:

Hardware	Command compatibility in Layer 2 aggregate interface view
MSR800	Yes
MSR 900	No
MSR900-E	Yes
MSR 930	Yes
MSR 20-1X	No
MSR 20	No
MSR 30	Yes
MSR 50	Yes
MSR 2600	Yes
MSR3600-51F	Yes

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.

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. H3C recommends that you 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. 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.

Examples

```
# Configure Ethernet 1/1 as an edge port.  
<Sysname> system-view  
[Sysname] interface ethernet 1/1  
[Sysname-Ethernet1/1] stp edged-port enable
```

Related commands

stp loop-protection

stp enable

Use **stp enable** to enable the spanning tree feature.

Use **undo stp enable** to disable the spanning tree feature.

Syntax

stp enable

undo stp enable

Default

The spanning tree feature is enabled on all ports and is globally disabled.

Views

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

Default command level

2: System level

Usage guidelines

The following matrix shows the command and hardware compatibility:

Hardware	Command compatibility in Layer 2 aggregate interface view
MSR800	Yes
MSR 900	No
MSR900-E	Yes
MSR 930	Yes
MSR 20-1X	No
MSR 20	No
MSR 30	Yes
MSR 50	Yes
MSR 2600	Yes
MSR3600-51F	Yes

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 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 you enable the spanning tree feature, the device operates in STP, RSTP, or MSTP mode, depending on the spanning tree mode setting.

When you enable the spanning tree feature, the device dynamically maintains the spanning tree status of VLANs based on received configuration BPDUs.

When you disable the spanning tree feature, the device stops maintaining the spanning tree status.

Examples

In MSTP mode, enable the spanning tree feature globally.

```
<Sysname> system-view  
[Sysname] stp enable
```

In MSTP mode, disable the spanning tree feature on port Ethernet 1/1.

```
<Sysname> system-view  
[Sysname] interface ethernet 1/1  
[Sysname-Ethernet1/1] undo stp enable
```

Related commands

stp mode

stp loop-protection

Use **stp loop-protection** to enable the loop guard function on the ports.

Use **undo stp loop-protection** to disable the loop guard function on the ports.

Syntax

stp loop-protection

undo stp loop-protection

Default

The loop guard function is disabled.

Views

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

Default command level

2: System level

Usage guidelines

The following matrix shows the command and hardware compatibility:

Hardware	Command compatibility in Layer 2 aggregate interface view
MSR800	Yes
MSR 900	No
MSR900-E	Yes
MSR 930	Yes
MSR 20-1X	No
MSR 20	No
MSR 30	Yes
MSR 50	Yes
MSR 2600	Yes
MSR3600-51F	Yes

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.

You cannot configure edge port settings and loop guard, or configure root guard and loop guard on a port at the same time.

Examples

```
# Enable the loop guard function on Ethernet 1/1.
<Sysname> system-view
[Sysname] interface ethernet 1/1
[Sysname-Ethernet1/1] stp loop-protection
```

Related commands

- **stp edged-port**
- **stp root-protection**

stp max-hops

Use **stp max-hops** to set the maximum hops of the MST region.

Use **undo stp max-hops** to restore the default.

Syntax

```
stp max-hops hops
undo stp max-hops
```

Default

The maximum number of hops of an MST region is 20.

Views

System view

Default command level

2: System level

Parameters

hops: Sets the maximum hops in the range of 1 to 40.

Usage guidelines

The maximum hops limit the size of the MST region.

Examples

```
# Set the maximum hops of the MST region to 35.
<Sysname> system-view
[Sysname] stp max-hops 35
```

Related commands

```
display stp
```

stp mcheck

Use **stp mcheck** to perform the mCheck operation globally or on a port.

Syntax

stp mcheck

Views

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

Default command level

2: System level

Usage guidelines

The following matrix shows the command and hardware compatibility:

Hardware	Command compatibility in Layer 2 aggregate interface view
MSR800	Yes
MSR 900	No
MSR900-E	Yes
MSR 930	Yes
MSR 20-1X	No
MSR 20	No
MSR 30	Yes
MSR 50	Yes
MSR 2600	Yes
MSR3600-51F	Yes

If a port on a device that runs MSTP or RSTP mode connects to an STP device, the port will automatically transit to the STP mode. It cannot automatically transit back to the original mode when:

- The STP device is shut down or removed.
- The STP device transits to the MSTP or RSTP mode.

Then, you can perform an mCheck operation to forcibly transit the port to operation in the original mode.

Suppose Device A running STP, Device B with no spanning tree feature enabled, and Device C running RSTP or MSTP are connected in order. Device B will transparently transmit STP BPDUs, and the port on Device C connecting to Device B will transit to the STP mode. After you enable the spanning tree feature on Device B, to run RSTP or MSTP 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 RSTP or MSTP mode on Device B.

The device operates in STP, RSTP, or MSTP mode depending on the spanning tree mode setting.

The **stp mcheck** command is effective only when the device operates in MSTP or RSTP mode.

Configured in system view, the setting takes effect globally.

Configured in Ethernet interface view, the setting takes effect only 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.

Examples

```
# Perform mCheck on Ethernet 1/1.
<Sysname> system-view
[Sysname] interface ethernet 1/1
[Sysname-Ethernet1/1] stp mcheck
```

Related commands

stp mode

stp mode

Use **stp mode** to configure the spanning tree operating mode.

Use **undo stp mode** to restore the default.

Syntax

```
stp mode { mstp | rstp | stp }
```

```
undo stp mode
```

Default

A spanning tree device operates in MSTP mode.

Views

System view

Default command level

2: System level

Parameters

mstp: Configures the spanning tree device to operate in MSTP mode.

rstp: Configures the spanning tree device to operate in RSTP mode.

stp: Configures the spanning tree device to operate in STP mode.

Usage guidelines

MSTP mode is compatible with RSTP mode, and RSTP mode is compatible with STP mode.

Examples

```
# Configure the spanning tree device to operate in STP mode.
<Sysname> system-view
[Sysname] stp mode stp
```

Related commands

- **stp mcheck**
- **stp enable**

stp no-agreement-check

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.

Syntax

```
stp no-agreement-check
```

undo stp no-agreement-check

Default

No Agreement Check is disabled.

Views

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

Default command level

2: System level

Usage guidelines

The following matrix shows the command and hardware compatibility:

Hardware	Command compatibility in Layer 2 aggregate interface view
MSR800	Yes
MSR 900	No
MSR900-E	Yes
MSR 930	Yes
MSR 20-1X	No
MSR 20	No
MSR 30	Yes
MSR 50	Yes
MSR 2600	Yes
MSR3600-51F	Yes

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 Ethernet 1/1.
```

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

```
[Sysname] interface ethernet 1/1
```

```
[Sysname-Ethernet1/1] stp no-agreement-check
```

stp pathcost-standard

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.

Syntax

```
stp pathcost-standard { dot1d-1998 | dot1t | legacy }  
undo stp pathcost-standard
```

Default

The default standard used by the device is **legacy**.

Views

System view

Default command 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.

Usage guidelines

If you change the standard that the device uses in calculating the default path costs, you restore the path costs to the default.

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
```

Related commands

- **stp cost**
- **display stp**

stp point-to-point

Use **stp point-to-point** to configure the link type of the ports.

Use **undo stp point-to-point** to restore the default.

Syntax

```
stp point-to-point { auto | force-false | force-true }  
undo stp point-to-point
```

Default

The default setting is **auto** and the spanning tree device automatically detects whether a port connects to a point-to-point link.

Views

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

Default command 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.

Usage guidelines

The following matrix shows the command and hardware compatibility:

Hardware	Command compatibility in Layer 2 aggregate interface view
MSR800	Yes
MSR 900	No
MSR900-E	Yes
MSR 930	Yes
MSR 20-1X	No
MSR 20	No
MSR 30	Yes
MSR 50	Yes
MSR 2600	Yes
MSR3600-51F	Yes

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. H3C recommends that you use the default setting to let 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 mode is effective on all MSTIs.

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 might bring a temporary loop.

Examples

```
# Configure the link connecting Ethernet 1/3 as a point-to-point link.
```

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

```
[Sysname] interface ethernet 1/3
```

```
[Sysname-Ethernet1/3] stp point-to-point force-true
```

Related commands

display stp

stp port priority

Use **stp port priority** to set the priority of the ports.

Use **undo stp port priority** to restore the default.

Syntax

stp [**instance** *instance-id*] **port priority** *priority*

undo stp [**instance** *instance-id*] **port priority**

Default

The port priority is 128.

Views

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

Default command level

2: System level

Parameters

instance *instance-id*: Sets the priority of the ports in a particular MSTI. The minimum value of *instance-id* is 0, representing the CIST, and the maximum value of *instance-id* is 15.

priority: Specifies the port priority. The value range is 0 to 240 in increments of 16 (as indicated by 0, 16, 32).

Usage guidelines

The following matrix shows the command and hardware compatibility:

Hardware	Command compatibility in Layer 2 aggregate interface view
MSR800	Yes
MSR 900	No
MSR900-E	Yes
MSR 930	Yes
MSR 20-1X	No
MSR 20	No
MSR 30	Yes
MSR 50	Yes
MSR 2600	Yes
MSR3600-51F	Yes

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.

To set the priority of an MSTP port in a specific MSTI, use this command with the MSTI specified.

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.

Examples

```
# In MSTP mode, set the priority of port Ethernet 1/3 to 16 in MSTI 2.
```

```
<Sysname> system-view
[Sysname] interface ethernet 1/3
[Sysname-Ethernet1/3] stp instance 2 port priority 16
```

Related commands

display stp

stp port-log

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.

Syntax

```
stp port-log { instance instance-id | all }
undo stp port-log { instance instance-id | all }
```

Default

This function is disabled.

Views

System view

Default command level

2: System level

Parameters

instance *instance-id*: Specifies an MSTI. The minimum value of *instance-id* is 0, representing the CIST, and the maximum value of *instance-id* is 15. To enable or disable outputting port state transition information in STP or RSTP mode, specify **instance 0**.

all: Specifies all MSTIs.

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 Ethernet1/1 has
been set to discarding state!
%Aug 16 00:49:41:856 2006 Sysname MSTP/3/MSTP_DISCARDING: Instance 2's Ethernet1/2 has
been set to forwarding state!
```

The output shows that Ethernet 1/1 in MSTI 2 transited to the discarding state and Ethernet 1/2 in MSTI 2 transited to the forwarding state.

stp priority

Use **stp priority** to set the priority of the device.

Use **undo stp priority** to restore the default priority.

Syntax

stp [**instance** *instance-id*] **priority** *priority*

undo stp [**instance** *instance-id*] **priority**

Default

The device priority is 32768.

Views

System view

Default command level

2: System level

Parameters

instance *instance-id*: Sets the priority of the device in a MSTI. The minimum value of *instance-id* is 0, representing the CIST, and the maximum value of *instance-id* is 15.

priority: Specifies the device priority. The value range is 0 to 61440 in increments of 4096 (as indicated by 0, 4096, 8192). You can set up to 16 priority values on the device. The smaller the value, the higher the device priority.

Usage guidelines

To set the priority of an MSTP device in a specific MSTI, use this command with the MSTI specified.

Examples

```
# In MSTP mode, set the device priority to 4096 in MSTI 1.
```

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

```
[Sysname] stp instance 1 priority 4096
```

stp region-configuration

Use **stp region-configuration** to enter MST region view.

Use **undo stp region-configuration** to restore the default MST region configurations.

Syntax

stp region-configuration

undo stp region-configuration

Views

System view

Default command level

2: System level

Usage guidelines

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

Use **stp root primary** to configure the device as the root bridge.

Use **undo stp root** to restore the default.

Syntax

```
stp [ instance instance-id ] root primary
undo stp [ instance instance-id ] root
```

Default

A device is not a root bridge.

Views

System view

Default command level

2: System level

Parameters

instance *instance-id*: Configures the device as the root bridge in a particular MSTI. The minimum value of *instance-id* is 0, representing the CIST, and the maximum value of *instance-id* is 15.

Usage guidelines

To set an MSTP device as the root bridge in a specific MSTI, use this command with the MSTI specified.

Once you specify the device as the root bridge, you cannot change the priority of the device.

Examples

```
# In MSTP mode, specify the device as the root bridge of MSTI 1.
<Sysname> system-view
[Sysname] stp instance 1 root primary
```

Related commands

- **stp priority**
- **stp root secondary**

stp root secondary

Use **stp root secondary** to configure the device as a secondary root bridge.

Use **undo stp root** to restore the default.

Syntax

```
stp [ instance instance-id ] root secondary
undo stp [ instance instance-id ] root
```

Default

A device is not a secondary root bridge.

Views

System view

Default command level

2: System level

Parameters

instance *instance-id*: Configures the device as a secondary root bridge in a particular MSTI. The minimum value of *instance-id* is 0, representing the CIST, and the maximum value of *instance-id* is 15.

Usage guidelines

To set an MSTP device as a secondary root bridge in a specific MSTI, use this command with the MSTI specified.

Once you specify the device as a secondary root bridge, you cannot change the priority of the device.

Examples

```
# In MSTP mode, specify the device as a secondary root bridge in MSTI 1.
<Sysname> system-view
[Sysname] stp instance 1 root secondary
```

Related commands

- **stp priority**
- **stp root primary**

stp root-protection

Use **stp root-protection** to enable the root guard function on the ports.

Use **undo stp root-protection** to disable the root guard function on the ports.

Syntax

```
stp root-protection
undo stp root-protection
```

Default

The root guard function is disabled.

Views

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

Default command level

2: System level

Usage guidelines

The following matrix shows the command and hardware compatibility:

Hardware	Command compatibility in Layer 2 aggregate interface view
MSR800	Yes
MSR 900	No
MSR900-E	Yes
MSR 930	Yes
MSR 20-1X	No
MSR 20	No
MSR 30	Yes
MSR 50	Yes
MSR 2600	Yes
MSR3600-51F	Yes

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.

You cannot configure root guard and loop guard on a port at the same time.

Examples

Enable the root guard function for Ethernet 1/1.

```
<Sysname> system-view
[Sysname] interface ethernet 1/1
[Sysname-Ethernet1/1] stp root-protection
```

Related commands

stp loop-protection

stp tc-protection

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.

Syntax

stp tc-protection enable
stp tc-protection disable

Default

The TC-BPDU attack guard function is enabled.

Views

System view

Default command level

2: System level

Usage guidelines

With the TC-BPDU guard function, you can set the maximum number of immediate forwarding address entry flushes that the device can perform every a certain period of time (10 seconds). For TC-BPDUs received in excess of the limit, the device performs a forwarding address entry flush when the time period expires. This prevents frequent flushing of forwarding address entries.

Examples

```
# Disable the TC-BPDU attack guard function for the device.
<Sysname> system-view
[Sysname] stp tc-protection disable
```

Related commands

stp tc-protection threshold

stp tc-protection threshold

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.

Syntax

```
stp tc-protection threshold number
undo stp tc-protection threshold
```

Default

The device can perform a maximum of 6 forwarding address entry flushes every 10 seconds.

Views

System view

Default command 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 range is 1 to 255.

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
```

Related commands

stp tc-protection

stp timer forward-delay

Use **stp timer forward-delay** to set the forward delay timer of the device.

Use **undo stp timer forward-delay** to restore the default.

Syntax

```
stp timer forward-delay time
undo stp timer forward-delay
```

Default

The forward delay timer is 15 seconds.

Views

System view

Default command level

2: System level

Parameters

time: Sets the forward delay (in 0.01 seconds). The value range is 400 to 3000 in increments of 100 (as indicated by 400, 500, 600).

Usage guidelines

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.

H3C recommends not setting 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.

Examples

In MSTP mode, set the forward delay timer to 20 seconds.

```
<Sysname> system-view  
[Sysname] stp timer forward-delay 2000
```

Related commands

- **stp timer hello**
- **stp timer max-age**
- **stp bridge-diameter**

stp timer hello

Use **stp timer hello** to set the hello time of the device.

Use **undo stp timer hello** to restore the default.

Syntax

stp timer hello *time*

undo stp timer hello

Default

The hello time is 2 seconds.

Views

System view

Default command level

2: System level

Parameters

time: Sets the hello time (in 0.01 seconds). The value range is 100 to 1000 in increments of 100 (as indicated by 100, 200, 300).

Usage guidelines

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.

H3C recommends not setting 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.

Examples

```
# In MSTP mode, set the hello time to 4 seconds.
```

```
<Sysname> system-view  
[Sysname] stp timer hello 400
```

Related commands

- **stp timer forward-delay**
- **stp timer max-age**
- **stp bridge-diameter**

stp timer max-age

Use **stp timer max-age** to set the max age timer of the device.

Use **undo stp timer max-age** to restore the default.

Syntax

```
stp timer max-age time
```

```
undo stp timer max-age
```

Default

The max age is 20 seconds.

Views

System view

Default command level

2: System level

Parameters

time: Sets the max age (in 0.01 seconds). The value range is 600 to 4000 in increments of 100 (as indicated by 600, 700, 800).

Usage guidelines

In the CIST of an MSTP 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 takes effect only on the CIST.

H3C recommends not setting 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.

Examples

```
# In MSTP mode, set the max age timer to 10 seconds.
```

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

```
[Sysname] stp timer max-age 1000
```

Related commands

- **stp timer forward-delay**
- **stp timer hello**
- **stp bridge-diameter**

stp timer-factor

Use **stp timer-factor** to configure the timeout time by setting the timeout factor.

Use **undo stp timer-factor** to restore the default.

Syntax

```
stp timer-factor factor
```

```
undo stp timer-factor
```

Default

The timeout factor of the device is set to 3.

Views

System view

Default command level

2: System level

Parameters

factor: Sets the timeout factor in the range of 1 to 20.

Usage guidelines

Timeout time = timeout factor × 3 × hello time.

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 might 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. H3C recommends that you set the timeout factor to 5, 6, or 7, for a stable network.

Examples

```
# Set the timeout factor of the device to 7.
```

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

```
[Sysname] stp timer-factor 7
```

Related commands

```
stp timer hello
```

stp transmit-limit

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.

Syntax

```
stp transmit-limit limit  
undo stp transmit-limit
```

Default

The maximum transmission rate of all ports is 10. Each port can send up to 10 BPDUs within each hello time.

Views

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

Default command level

2: System level

Parameters

limit: Sets the maximum number of BPDUs the ports can send within each hello time. The value range is 1 to 255.

Usage guidelines

The following matrix shows the command and hardware compatibility:

Hardware	Command compatibility in Layer 2 aggregate interface view
MSR800	Yes
MSR 900	No
MSR900-E	Yes
MSR 930	Yes
MSR 20-1X	No
MSR 20	No
MSR 30	Yes
MSR 50	Yes
MSR 2600	Yes
MSR3600-51F	Yes

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. H3C recommends that you use the default value.

Examples

```
# Set the maximum transmission rate of port Ethernet 1/1 to 5.
```

```
<Sysname> system-view  
[Sysname] interface ethernet 1/1
```

```
[Sysname-Ethernet1/1] stp transmit-limit 5
```

vlan-mapping modulo

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.

Syntax

```
vlan-mapping modulo modulo
```

Default

All VLANs are mapped to the CIST (MSTI 0).

Views

MST region view

Default command level

2: System level

Parameters

modulo: Sets the modulo value in the range of 1 to 15.

Usage guidelines

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 $(\text{VLAN ID} - 1) \% \text{modulo} + 1$, where $(\text{VLAN ID} - 1) \% \text{modulo}$ is the modulo operation for $(\text{VLAN ID} - 1)$. 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.

Examples

```
# Map VLANs to MSTIs as per modulo 8.
```

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

```
[Sysname] stp region-configuration
```

```
[Sysname-mst-region] vlan-mapping modulo 8
```

Related commands

- **region-name**
- **revision-level**
- **display stp region-configuration**
- **check region-configuration**
- **active region-configuration**

Ethernet link aggregation configuration commands

bandwidth

Use **bandwidth** to set the expected bandwidth for an aggregate interface or subinterface.

Use **undo bandwidth** to cancel the configuration.

Syntax

bandwidth *bandwidth-value*

undo bandwidth

Views

Layer 2 aggregate interface view, Layer 3 aggregate interface view, Layer 3 aggregate subinterface view

Default command level

2: System level

Parameters

bandwidth-value: Specifies the expected bandwidth in the range of 1 to 4294967295 kbps.

Usage guidelines

The following matrix shows the command and hardware compatibility in Layer 2 aggregate interface view:

Hardware	Command compatibility
MSR800	Yes
MSR 900	No
MSR900-E	Yes
MSR 930	Yes
MSR 20-1X	No
MSR 20	No
MSR 30	Yes
MSR 50	Yes
MSR 2600	Yes
MSR3600-51F	Yes

You can get the expected bandwidth of an interface by querying the ifspeed value of the MIB node with third-party software.

The expected bandwidth is used by network management systems for monitoring bandwidth, but does not affect the actual bandwidth of the interface.

Examples

```
# Set the expected bandwidth to 10,000 kbps for Layer 2 aggregate interface Bridge-Aggregation 1.  
<Sysname> system-view
```

```
[Sysname] interface bridge-aggregation 1
[Sysname-Bridge-Aggregation1] bandwidth 10000
```

default

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

Syntax

default

Views

Layer 2 aggregate interface view, Layer 3 aggregate interface view, Layer 3 aggregate subinterface view

Default command level

2: System level

Usage guidelines



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.

The following matrix shows the command and hardware compatibility in Layer 2 aggregate interface view:

Hardware	Command compatibility
MSR800	Yes
MSR 900	No
MSR900-E	Yes
MSR 930	Yes
MSR 20-1X	No
MSR 20	No
MSR 30	Yes
MSR 50	Yes
MSR 2600	Yes
MSR3600-51F	Yes

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

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.

Syntax

description *text*

undo description

Default

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

Views

Layer 2 aggregate interface view, Layer 3 aggregate interface view, Layer 3 aggregate subinterface view

Default command level

2: System level

Usage guidelines

The following matrix shows the command and hardware compatibility in Layer 2 aggregate interface view:

Hardware	Command compatibility
MSR800	Yes
MSR 900	No
MSR900-E	Yes
MSR 930	Yes
MSR 20-1X	No
MSR 20	No
MSR 30	Yes
MSR 50	Yes
MSR 2600	Yes
MSR3600-51F	Yes

Parameters

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

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

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

Syntax

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

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

Views

Any view

Default command level

1: Monitor level

Parameters

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

The following matrix shows the **bridge-aggregation** keyword and hardware compatibility:

Hardware	keyword compatibility
MSR800	Yes
MSR 900	No
MSR900-E	Yes
MSR 930	Yes
MSR 20-1X	No
MSR 20	No
MSR 30	Yes
MSR 50	Yes
MSR 2600	Yes
MSR3600-51F	Yes

route-aggregation: Displays information about Layer 3 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 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.

Usage guidelines

The following matrix shows the command and hardware compatibility:

Hardware	Command compatibility
MSR800	Yes
MSR 900	No
MSR900-E	Yes
MSR 930	Yes
MSR 20-1X	No
MSR 20	No
MSR 30	Yes
MSR 50	Yes
MSR 2600	Yes
MSR3600-51F	Yes

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

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

If **bridge-aggregation** *interface-number* or **route-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
```

Display information about Layer 3 aggregate interface Route-Aggregation 1.

```
<Sysname> display interface route-aggregation 1
Route-Aggregation1 current state: DOWN
Line protocol current state: DOWN
Description: Route-Aggregation1 Interface
The Maximum Transmit Unit is 1500
Internet protocol processing : disabled
IP Packet Frame Type: PKTFMT_ETHNT_2, Hardware Address: 000f-2368-6668
IPv6 Packet Frame Type: PKTFMT_ETHNT_2, Hardware Address: 000f-2368-6668
Output queue : (Urgent queuing : Size/Length/Discards)  0/100/0
Output queue : (Protocol queuing : Size/Length/Discards)  0/500/0
```

```
Output queue : (FIFO queuing : Size/Length/Discards) 0/75/0
Last clearing of counters: Never
  Last 5 seconds input rate 0.00 bytes/sec, 0 bits/sec, 0.00 packets/sec
  Last 5 seconds output rate 0.00 bytes/sec, 0 bits/sec, 0.00 packets/sec
  0 packets input, 0 bytes, 0 drops
  0 packets output, 0 bytes, 0 drops
```

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
```

Display brief information about Layer 3 aggregate interface Route-Aggregation 1.

```
<Sysname> display interface route-aggregation 1 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
RAGG1              DOWN DOWN    --
```

Display information about all Layer 2 aggregate interfaces in DOWN state.

```
<Sysname> display interface bridge-aggregation brief down
The brief information of interface(s) under bridge mode:
Link: ADM - administratively down; Stby - standby
Interface          Link Cause
BAGG1              DOWN Not connected
```

Display information about all Layer 3 aggregate interfaces in DOWN state.

```
<Sysname> display interface route-aggregation brief down
The brief information of interface(s) under route mode:
Link: ADM - administratively down; Stby - standby
Interface          Link Cause
RAGG1              DOWN Not connected
```

Table 21 Command output

Field	Description
Bridge-Aggregation1/Route-Aggregation1 current state	Layer 2/Layer 3 interface status: <ul style="list-style-type: none"> • 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 VLAN ID.
Last clearing of counters	Time when the reset counters interface command was last used to clear the interface statistics.

Field	Description
	Never indicates the reset counters interface command has never been used on the interface since the device's startup.
Output queue : (Urgent queuing : Size/Length/Discards)	Output queue (current message number in the urgent queue/ maximum number of messages allowed in the urgent queue/number of discarded messages).
Output queue : (Protocol queuing : Size/Length/Discards)	Output queue (current message number in the protocol queue/ maximum number of messages allowed in the protocol queue/number of discarded messages).
Output queue : (FIFO queuing : Size/Length/Discards)	Output queue (current message number in the FIFO queue/ maximum number of messages allowed in the FIFO queue/number of discarded messages).
The brief information of interface(s) under route mode	Brief information about Layer 3 interfaces.
The brief information of interface(s) under bridge mode	Brief information about Layer 2 interfaces.
Link: ADM - administratively down; Stby - standby	Link status: <ul style="list-style-type: none"> • 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. To see the primary interface, use the display standby state command (see <i>High Availability Command Reference</i>).
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, its protocol attribute includes the spoofing flag (an s in parentheses).
Interface	Abbreviated interface name.
Link	Physical link state of the interface.
Speed	Interface speed, in bps.
Cause	Cause of a DOWN physical link.

display lacp system-id

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

Syntax

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

Views

Any view

Default command 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.

Usage guidelines

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

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.

Examples

```
# Display the local system ID.
```

```
<Sysname> display lacp system-id
```

```
Actor System ID: 0x8000, 0000-fc00-6504
```

Table 22 Command output

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

Related commands

lacp system-priority

display link-aggregation member-port

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.

Syntax

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

Views

Any view

Default command level

1: Monitor level

Parameters

interface-list: Specifies a list of link aggregation member ports, in the format *interface-type interface-number1* [**to** *interface-type interface-number2*], where *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.

Usage guidelines

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 Ethernet 1/1, a member port of a static aggregation group.

```
<Sysname> display link-aggregation member-port ethernet 1/1
```

```
Flags: A -- LACP_Activity, B -- LACP_Timeout, C -- Aggregation,  
       D -- Synchronization, E -- Collecting, F -- Distributing,  
       G -- Defaulted, H -- Expired
```

```
Ethernet1/1:
```

```
Aggregation Interface: Bridge-Aggregation1
```

```
Port Number: 1
```

```
Port Priority: 32768
```

```
Oper-Key: 1
```

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

```
<Sysname> display link-aggregation member-port ethernet 1/2
```

```
Flags: A -- LACP_Activity, B -- LACP_Timeout, C -- Aggregation,  
       D -- Synchronization, E -- Collecting, F -- Distributing,  
       G -- Defaulted, H -- Expired
```

```
Ethernet1/2:
```

```
Aggregation Interface: Bridge-Aggregation10
```

```
Local:
```

```
    Port Number: 2
```

```
    Port Priority: 32768
```

```
    Oper-Key: 2
```

```
    Flag: {ACDEF}
```

```
Remote:
```

```
    System ID: 0x8000, 000f-e267-6c6a
```

```
    Port Number: 26
```

```
    Port Priority: 32768
```

```
    Oper-Key: 2
```

```
    Flag: {ACDEF}
```

```
Received LACP Packets: 5 packet(s)
```

```
Illegal: 0 packet(s)
```

```
Sent LACP Packets: 7 packet(s)
```

Table 23 Command output

Field	Description
Flags	LACP state flags: <ul style="list-style-type: none">• A—LACP is enabled.• B—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.

Field	Description
	<ul style="list-style-type: none"> G—The sending system receives frames in default state. H—The sending system receives frames in 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.
System ID	Remote end system ID, containing 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

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

Syntax

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

Views

Any view

Default command 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.

Usage guidelines

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

Table 24 Command output

Field	Description
Aggregation Interface Type	Aggregate interface type: <ul style="list-style-type: none"> BAGG—Layer 2 aggregate interface. RAGG—Layer 3 aggregate interface.
Aggregation Mode	Aggregation group type: <ul style="list-style-type: none"> S—Static link aggregation. D—Dynamic aggregation.
Loadsharing Type	Load sharing type: <ul style="list-style-type: none"> Shar—Load sharing. NonS—Non-load sharing.
Actor System ID	Local system ID, which contains 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 contains 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: Only NonS is supported.

display link-aggregation verbose

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

Syntax

```

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

```

Views

Any view

Default command level

1: Monitor level

Parameters

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

The following matrix shows the **bridge-aggregation** keyword and hardware compatibility:

Hardware	keyword compatibility
MSR800	Yes
MSR 900	No
MSR900-E	Yes
MSR 930	Yes
MSR 20-1X	No
MSR 20	No
MSR 30	Yes
MSR 50	Yes
MSR 2600	Yes
MSR3600-51F	Yes

route-aggregation: Displays detailed information about the Layer 3 aggregation groups corresponding to Layer 3 aggregate interfaces.

interface-number. Specifies an existing aggregate interface by its 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.

Usage guidelines

The following matrix shows the command and hardware compatibility:

Hardware	Command compatibility
MSR800	Yes
MSR 900	No
MSR900-E	Yes
MSR 930	Yes
MSR 20-1X	No
MSR 20	No
MSR 30	Yes
MSR 50	Yes
MSR 2600	Yes
MSR3600-51F	Yes

To display the information about a specific Layer 2 or Layer 3 aggregation group, use the **display link-aggregation verbose bridge-aggregation** *interface-number* or **display link-aggregation verbose route-aggregation** *interface-number* command.

To display the information about all Layer 2 or Layer 3 aggregation groups, use the **display link-aggregation verbose bridge-aggregation** or **display link-aggregation verbose route-aggregation** command.

To display the information about all aggregation groups, use the **display link-aggregation verbose** command.

The **bridge-aggregation** or **route-aggregation** keyword is available only when you create Layer 2 or Layer 3 aggregate interfaces on the device.

Examples

Display detailed information about the aggregation group corresponding to Layer 2 aggregate interface Bridge-Aggregation 10, which is a dynamic aggregation group.

```
<Sysname> display link-aggregation verbose bridge-aggregation 10
```

```
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-Aggregation10
```

```
Aggregation Mode: Dynamic
```

```
Loadsharing Type: NonS
```

```
System ID: 0x8000, 000f-e267-6c6a
```

```
Local:
```

Port	Status	Priority	Oper-Key	Flag
Eth0/1	S	32768	2	{ACDEF}
Eth0/2	S	32768	2	{ACDEF}

```
Remote:
```

Actor	Partner	Priority	Oper-Key	SystemID	Flag
Eth0/1	32	32768	2	0x8000, 000f-e267-57ad	{ACDEF}
Eth0/2	26	32768	2	0x8000, 000f-e267-57ad	{ACDEF}

Display detailed information about the aggregation group corresponding to Layer 2 aggregate interface Bridge-Aggregation 20, which is a static aggregation group.

```
<Sysname> display link-aggregation verbose bridge-aggregation 20
```

```
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-Aggregation20
```

```
Aggregation Mode: Static
```

```
Loadsharing Type: NonS
```

Port	Status	Priority	Oper-Key
Eth0/1	U	32768	1

```

Eth0/2          U          32768      1
Eth0/3          U           63         1

```

Table 25 Command output

Field	Description
Loadsharing Type	Load sharing type: <ul style="list-style-type: none"> • Shar—Load sharing. • NonS—Non-load sharing.
Port Status	Port state: Selected or unselected.
Flags	LACP state flags: <ul style="list-style-type: none"> • A—LACP is enabled. • B—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 default state. • H—The sending system receives frames in expired state.
Aggregation Interface	Name of the aggregate interface.
Aggregation Mode	Mode of the aggregation group: <ul style="list-style-type: none"> • Static for static aggregation. • Dynamic for dynamic aggregation.
System ID	Local system ID, containing 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

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.

Syntax

enable snmp trap updown

undo enable snmp trap updown

Default

LinkUp/linkDown trap generation is enabled for an aggregate interface.

Views

Layer 2 aggregate interface view, Layer 3 aggregate interface view, Layer 3 aggregate subinterface view

Default command level

2: System level

Usage guidelines

The following matrix shows the command and hardware compatibility in Layer 2 aggregate interface view:

Hardware	Command compatibility
MSR800	Yes
MSR 900	No
MSR900-E	Yes
MSR 930	Yes
MSR 20-1X	No
MSR 20	No
MSR 30	Yes
MSR 50	Yes
MSR 2600	Yes
MSR3600-51F	Yes

For an aggregate interface to generate linkUp/linkDown traps when its link state changes, you must 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

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.

Syntax

interface bridge-aggregation *interface-number*

undo interface bridge-aggregation *interface-number*

Views

System view

Default command level

2: System level

Parameters

interface-number: Specifies a Layer 2 aggregate interface by its number in the range of 1 to 1024.

Usage guidelines

The following matrix shows the command and hardware compatibility:

Hardware	Command compatibility
MSR800	Yes
MSR 900	No
MSR900-E	Yes
MSR 930	Yes
MSR 20-1X	No
MSR 20	No
MSR 30	Yes
MSR 50	Yes
MSR 2600	Yes
MSR3600-51F	Yes

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]
```

interface route-aggregation

Use **interface route-aggregation** to create a Layer 3 aggregate interface or subinterface and enter the Layer 3 aggregate interface or subinterface view.

Use **undo interface route-aggregation** to remove a Layer 3 aggregate interface or subinterface.

Syntax

```
interface route-aggregation { interface-number | interface-number.subnumber }  
undo interface route-aggregation { interface-number | interface-number.subnumber }
```

Views

System view

Default command level

2: System level

Parameters

interface-number: Specifies a Layer 3 aggregate interface by its number in the range of 1 to 16.

interface-number.subnumber: Specifies a subinterface of a Layer 3 aggregate interface. The *interface-number* argument specifies the main interface number. The *subnumber* argument specifies the subinterface number and is separated from the main interface number by a dot (.). The value range for the *subnumber* argument is 1 to 4094.

Usage guidelines

When you create a Layer 3 aggregate interface, a Layer 3 aggregation group with the same number is automatically created. Removing the Layer 3 aggregate interface also removes the Layer 3 aggregation group. At the same time, the member ports of the aggregation group, if any, leave the aggregation group.

Removing a Layer 3 aggregate subinterface does not affect the state of the main interface and the corresponding aggregation group.

Examples

Create Layer 3 aggregate interface Route-Aggregation 1 and enter its view.

```
<Sysname> system-view
[Sysname] interface route-aggregation 1
[Sysname-Route-Aggregation1]
```

lacp period short

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.

Syntax

lacp period short

undo lacp period

Default

The LACP timeout interval is the long timeout interval (30 seconds).

Views

Ethernet interface view

Default command level

2: System level

Examples

Set the LACP timeout interval on Ethernet 1/1 to the short timeout interval (1 second).

```
<Sysname> system-view
[Sysname] interface ethernet 1/1
[Sysname-Ethernet1/1] lacp period short
```

lacp system-priority

Use **lacp system-priority** to set the LACP priority of the local system.

Use **undo lacp system-priority** to restore the default setting.

Syntax

lacp system-priority *system-priority*

undo lacp system-priority

Default

The system LACP priority is 32768.

Views

System view

Default command 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.

Examples

```
# Set the system LACP priority to 64.  
<Sysname> system-view  
[Sysname] lacp system-priority 64
```

link-aggregation mode

Use **link-aggregation mode dynamic** to configure an aggregation group to operate in dynamic aggregation mode.

Use **undo link-aggregation mode** to restore the default setting.

Syntax

link-aggregation mode dynamic

undo link-aggregation mode

Default

An aggregation group operates in static aggregation mode.

Views

Layer 2 aggregate interface view, Layer 3 aggregate interface view

Default command level

2: System level

Usage guidelines

The following matrix shows the command and hardware compatibility in Layer 2 aggregate interface view:

Hardware	Command compatibility
MSR800	Yes
MSR 900	No
MSR900-E	Yes
MSR 930	Yes
MSR 20-1X	No

Hardware	Command compatibility
MSR 20	No
MSR 30	Yes
MSR 50	Yes
MSR 2600	Yes
MSR3600-51F	Yes

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

Use **link-aggregation port-priority** to set the aggregation priority of a port.

Use **undo link-aggregation port-priority** to restore the default setting.

Syntax

link-aggregation port-priority *port-priority*

undo link-aggregation port-priority

Default

The aggregation priority of a port is 32768.

Views

Ethernet interface view

Default command 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.

Usage guidelines

The following matrix shows the command and hardware compatibility:

Hardware	Command compatibility
MSR800	Yes
MSR 900	No
MSR900-E	Yes
MSR 930	Yes
MSR 20-1X	No

Hardware	Command compatibility
MSR 20	No
MSR 30	Yes
MSR 50	Yes
MSR 2600	Yes
MSR3600-51F	Yes

When the number of ports eligible for becoming Selected ports exceeds the maximum number of Selected ports allowed in an aggregation group, changing the aggregation priority of a port might affect the aggregation state of the ports in the aggregation group.

Examples

Set the aggregation priority of port Ethernet 1/1 to 64.

```
<Sysname> system-view
[Sysname] interface ethernet 1/1
[Sysname-Ethernet1/1] link-aggregation port-priority 64
```

mtu

Use **mtu** to set the MTU of a Layer 3 aggregate interface or subinterface.

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

Syntax

mtu *size*

undo mtu

Default

The MTU for Layer 3 aggregate interfaces and subinterfaces is 1500 bytes.

Views

Layer 3 aggregate interface view, Layer 3 aggregate subinterface view

Default command level

2: System level

Parameters

size: Specifies the MTU in the range of 46 to 1560 bytes.

Examples

Set the MTU of Layer 3 aggregate interface Route-Aggregation 1 to 1430 bytes.

```
<Sysname> system-view
[Sysname] interface route-aggregation 1
[Sysname-Route-Aggregation1] mtu 1430
```

Related commands

display interface

port link-aggregation group

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.

Syntax

port link-aggregation group *number*

undo port link-aggregation group

Views

Ethernet interface view

Default command level

2: System level

Parameters

number: Specifies the number of the aggregate interface corresponding to an aggregation group. The value range for this argument is 1 to 1024 for Layer 2 aggregate interfaces and 1 to 16 for Layer 3 aggregate interfaces.

The following matrix shows the *number* argument for Layer 2 aggregate interfaces and hardware compatibility:

Hardware	Argument compatibility
MSR800	Yes
MSR 900	No
MSR900-E	Yes
MSR 930	Yes
MSR 20-1X	No
MSR 20	No
MSR 30	Yes
MSR 50	Yes
MSR 2600	Yes
MSR3600-51F	Yes

Usage guidelines

The following matrix shows the command and hardware compatibility:

Hardware	Command compatibility
MSR800	Yes
MSR 900	No
MSR900-E	Yes
MSR 930	Yes
MSR 20-1X	No
MSR 20	No
MSR 30	Yes
MSR 50	Yes
MSR 2600	Yes

Hardware	Command compatibility
MSR3600-51F	Yes

A Layer 2 Ethernet interface can be assigned to a Layer 2 aggregation group only, and a Layer 3 Ethernet interface can be assigned to a Layer 3 aggregation group only.

An Ethernet interface can belong to only one aggregation group.

Examples

Assign Layer 2 Ethernet interface Ethernet 1/1 to Layer 2 aggregation group 1.

```
<Sysname> system-view
[Sysname] interface ethernet 1/1
[Sysname-Ethernet1/1] port link-aggregation group 1
```

Assign Layer 3 Ethernet interface Ethernet 1/2 to Layer 3 aggregation group 2.

```
<Sysname> system-view
[Sysname] interface ethernet 1/2
[Sysname-Ethernet1/2] port link-aggregation group 2
```

reset counters interface

Use **reset counters interface** to clear the statistics of the specified aggregate interface or interfaces.

Syntax

```
reset counters interface [ { bridge-aggregation | route-aggregation } [ interface-number ] ]
```

Views

User view

Default command level

2: System level

Parameters

bridge-aggregation: Clears statistics for Layer 2 aggregate interfaces.

The following matrix shows the **bridge-aggregation** keyword and hardware compatibility:

Hardware	keyword compatibility
MSR800	Yes
MSR 900	No
MSR900-E	Yes
MSR 930	Yes
MSR 20-1X	No
MSR 20	No
MSR 30	Yes
MSR 50	Yes
MSR 2600	Yes
MSR3600-51F	Yes

route-aggregation: Clears statistics for Layer 3 aggregate interfaces.

interface-number: Specifies an aggregate interface by its number in the range of 1 to 1024 for Layer 2 aggregate interfaces and 1 to 16 for Layer 3 aggregate interfaces.

Usage guidelines

Before collecting statistics for a Layer 2 aggregate interface within a specific period, clear the existing statistics of the interface.

- If no keyword or argument is specified, the command clears the statistics of all interfaces in the system.
- If only the **bridge-aggregation** or **route-aggregation** keyword is specified, the command clears the statistics of all Layer 2 or Layer 3 aggregate interfaces.
- If the **bridge-aggregation** *interface-number* or **route-aggregation** *interface-number* option is specified, the command clears the statistics of the specified Layer 2 or Layer 3 aggregate interface.
- The **bridge-aggregation** or **route-aggregation** keyword becomes available only after you create Layer 2 or Layer 3 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

Use **reset lacp statistics** to clear the LACP statistics on the specified member ports or all member ports, if no member ports are specified.

Syntax

```
reset lacp statistics [ interface interface-list ]
```

Views

User view

Default command level

1: Monitor level

Parameters

interface-list: Specifies a list of link aggregation member ports, in the format *interface-type interface-number1* [**to** *interface-type interface-number2*], where *interface-type interface-number* specifies an interface by its type and number.

Examples

```
# Clear the LACP statistics on all link aggregation member ports.
```

```
<Sysname> reset lacp statistics
```

Related commands

```
display link-aggregation member-port
```

shutdown

Use **shutdown** to shut down the aggregate interface or subinterface.

Use **undo shutdown** to bring up the aggregate interface or subinterface.

Syntax

shutdown

undo shutdown

Default

Aggregate interfaces and subinterfaces are up.

Views

Layer 2 aggregate interface view, Layer 3 aggregate interface view, Layer 3 aggregate subinterface view

Default command level

2: System level

Usage guidelines

The following matrix shows the command and hardware compatibility in Layer 2 aggregate interface view:

Hardware	Command compatibility
MSR800	Yes
MSR 900	No
MSR900-E	Yes
MSR 930	Yes
MSR 20-1X	No
MSR 20	No
MSR 30	Yes
MSR 50	Yes
MSR 2600	Yes
MSR3600-51F	Yes

Shutting down or bringing up a Layer 3 aggregate interface also shuts down or brings up its subinterfaces. Shutting down or bringing up a Layer 3 aggregate subinterface does not affect its main interface.

Examples

Shut down Layer 2 aggregate interface Bridge-Aggregation 1.

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

```
[Sysname] interface bridge-aggregation 1
```

```
[Sysname-Bridge-Aggregation1] shutdown
```

GVRP configuration commands

display garp statistics

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.

Syntax

```
display garp statistics [ interface interface-list ] [ | { begin | exclude | include }  
regular-expression ]
```

Views

Any view

Default command 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. By using each port list, you can specify a single port in the form of *interface-type interface-number*, or 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.

Usage guidelines

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 determine whether a GVRP-enabled port is operating correctly.

- 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 correctly 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.

Examples

Display GARP statistics on ports Ethernet 1/1 and Ethernet 1/2.

```
<Sysname> display garp statistics interface ethernet 1/1 to ethernet 1/2
```

```
GARP statistics on port Ethernet1/1
```

```
Number of GVRP Frames Received      : 5  
Number of GVRP Frames Transmitted   : 2
```

```
Number of Frames Discarded          : 1
```

```
GARP statistics on port Ethernet1/2
```

```
Number of GVRP Frames Received      : 3
```

```
Number of GVRP Frames Transmitted   : 4
```

```
Number of Frames Discarded          : 2
```

Related commands

reset garp statistics

display garp timer

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.

Syntax

```
display garp timer [ interface interface-list ] [ [ { begin | exclude | include } regular-expression ]
```

Views

Any view

Default command 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. By using each port list, you can specify a single port in the form of *interface-type interface-number*, or 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.

Examples

```
# Display GARP timers on port Ethernet 1/1.
```

```
<Sysname> display garp timer interface ethernet 1/1
```

```
GARP timers on port Ethernet1/1
```

```
Garp Join Time          : 20 centiseconds
```

```
Garp Leave Time         : 60 centiseconds
```

```
Garp LeaveAll Time      : 1000 centiseconds
```

```
Garp Hold Time          : 10 centiseconds
```

Related commands

- **garp timer hold**
- **garp timer join**

- **garp timer leave**
- **garp timer leaveall**

display gvrp local-vlan

Use **display gvrp local-vlan** to display the local VLAN information maintained by GVRP on the specified port.

Syntax

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

Views

Any view

Default command 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.

Examples

Display the local VLAN information maintained by GVRP on Ethernet 1/1.

```
<Sysname> display gvrp local-vlan interface ethernet 1/1
Following VLANs exist in GVRP local database:
 1(default),2-500
```

display gvrp state

Use **display gvrp state** to display GVRP state machines in a specified VLAN on a port.

Syntax

display gvrp state interface *interface-type interface-number* **vlan** *vlan-id* [| { **begin** | **exclude** | **include** } *regular-expression*]

Views

Any view

Default command 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 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.

Examples

Display GVRP state machines in VLAN 2 on port Ethernet 1/1.

```
<Sysname> display gvrp state interface ethernet 1/1 vlan 2
      GVRP state of VLAN 2 on port Ethernet1/1

      Applicant state machine      : VP
      Registrar state machine     : MTR
```

Table 26 Command output

Field	Description
GVRP state of VLAN 2 on port Ethernet1/1	Information about the GVRP state machines in VLAN 2 on port Ethernet 1/1.
Applicant state machine	The 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: <ul style="list-style-type: none">• 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."
Registrar state machine	The 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: <ul style="list-style-type: none">• 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

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.

Syntax

```
display gvrp statistics [ interface interface-list ] [ | { begin | exclude | include } regular-expression ]
```

Views

Any view

Default command level

1: Monitor level

Parameters

interface *interface-list*: Displays the GVRP statistics of one or multiple Ethernet ports. You can specify up to 10 Ethernet port lists, by each of which you can specify an individual port in the form of *interface-type interface-number*, or 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.

Examples

Display GVRP statistics for trunk port Ethernet 1/1.

```
<Sysname> display gvrp statistics interface ethernet 1/1
      GVRP statistics on port Ethernet1/1
```

```
      GVRP Status           : Enabled
      GVRP Running          : YES
      GVRP Failed Registrations : 0
      GVRP Last Pdu Origin   : 0000-0000-0000
      GVRP Registration Type : Normal
```

Table 27 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

Use **display gvrp status** to display the global GVRP state.

Syntax

```
display gvrp status [ | { begin | exclude | include } regular-expression ]
```

Views

Any view

Default command 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.

Examples

```
# Display the global GVRP state.
```

```
<Sysname> display gvrp status
```

```
GVRP is enabled
```

display gvrp vlan-operation

Use **display gvrp vlan-operation** to display information about dynamic VLAN operations on a port.

Syntax

```
display gvrp vlan-operation interface interface-type interface-number [ | { begin | exclude | include } regular-expression ]
```

Views

Any view

Default command 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.

Examples

```
# Display information about dynamic VLAN operations on Ethernet 1/1.
```

```
<Sysname> display gvrp vlan-operation interface ethernet 1/1
```

```
Dynamic VLAN operations on port Ethernet1/1
```

```
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

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 might fail if the default is beyond the valid value range for the Hold timer.

Syntax

garp timer hold *timer-value*

undo garp timer hold

Default

The Hold timer is 10 centiseconds.

Views

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

Default command level

2: System level

Parameters

timer-value: Specifies the Hold timer (in centiseconds), which must be a multiple of 5 and range from 10 (inclusive) to half the Join timer (inclusive).

Usage guidelines

The following matrix shows the command and hardware compatibility:

Hardware	Command compatibility
MSR800	No
MSR 900	No
MSR900-E	No
MSR 930	No
MSR 20-1X	No
MSR 20	No
MSR 30	Yes
MSR 50	Yes
MSR 2600	Yes
MSR3600-51F	Yes

Examples

Set the GARP Hold timer to 15 centiseconds, assuming that the Join timer is 30 centiseconds.

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

```
[Sysname] interface ethernet 1/1
```

```
[Sysname-Ethernet1/1] garp timer hold 15
```

Related commands

- **display garp timer**
- **garp timer join**

garp timer join

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 might fail if the default is beyond the valid value range for the Join timer.

Syntax

garp timer join *timer-value*

undo garp timer join

Default

The Join timer is set to 20 centiseconds.

Views

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

Default command level

2: System level

Parameters

timer-value: Specifies the 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).

Usage guidelines

The following matrix shows the command and hardware compatibility:

Hardware	Command compatibility
MSR800	No
MSR 900	No
MSR900-E	No
MSR 930	No
MSR 20-1X	No
MSR 20	No
MSR 30	Yes
MSR 50	Yes
MSR 2600	Yes
MSR3600-51F	Yes

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 ethernet 1/1  
[Sysname-Ethernet1/1] garp timer join 25
```

Related commands

- **display garp timer**
- **garp timer hold**

- **garp timer leave**

garp timer leave

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 might fail if the default is beyond the valid value range for the Leave timer.

Syntax

garp timer leave *timer-value*

undo garp timer leave

Default

The Leave timer is set to 60 centiseconds.

Views

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

Default command level

2: System level

Parameters

timer-value: Specifies the Leave timer (in centiseconds), which must be a multiple of 5 and range from twice the Join timer (exclusive) to the LeaveAll timer (exclusive).

Usage guidelines

The following matrix shows the command and hardware compatibility:

Hardware	Command compatibility
MSR800	No
MSR 900	No
MSR900-E	No
MSR 930	No
MSR 20-1X	No
MSR 20	No
MSR 30	Yes
MSR 50	Yes
MSR 2600	Yes
MSR3600-51F	Yes

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 ethernet 1/1
[Sysname-Ethernet1/1] garp timer leave 100
```

Related commands

- **display garp timer**
- **garp timer join**
- **garp timer leaveall**

garp timer leaveall

Use **garp timer leaveall** to set the GARP LeaveAll timer.

Use **undo garp timer leaveall** to restore the default. This might fail if the default is beyond the valid value range for the LeaveAll timer.

Syntax

garp timer leaveall *timer-value*

undo garp timer leaveall

Default

The LeaveAll timer is 1000 centiseconds.

Views

System view

Default command level

2: System level

Parameters

timer-value: Specifies the 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).

Usage guidelines

To keep the dynamic VLANs learned through GVRP stable, do not set the LeaveAll timer smaller than its default value.

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
```

Related commands

- **display garp timer**
- **garp timer leave**

gvrp

Use **gvrp** to enable GVRP.

Use **undo gvrp** to disable GVRP.

Syntax

gvrp

undo gvrp

Default

GVRP is disabled.

Views

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

Default command level

2: System level

Usage guidelines

The following matrix shows the command and hardware compatibility:

Hardware	Command compatibility
MSR800	No
MSR 900	No
MSR900-E	No
MSR 930	No
MSR 20-1X	No
MSR 20	No
MSR 30	Yes
MSR 50	Yes
MSR 2600	Yes
MSR3600-51F	Yes

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.

Examples

```
# Enable GVRP globally.  
<Sysname> system-view  
[Sysname] gvrp  
GVRP is enabled globally.
```

Related commands

display gvrp status

gvrp registration

Use **gvrp registration** to configure the GVRP registration mode.

Use **undo gvrp registration** to restore the default.

Syntax

```
gvrp registration { fixed | forbidden | normal }  
undo gvrp registration
```

Default

The GVRP registration mode is normal.

Views

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

Default command 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.

Usage guidelines

The following matrix shows the command and hardware compatibility:

Hardware	Command compatibility
MSR800	No
MSR 900	No
MSR900-E	No
MSR 930	No
MSR 20-1X	No
MSR 20	No
MSR 30	Yes
MSR 50	Yes
MSR 2600	Yes
MSR3600-51F	Yes

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.

Examples

```
# Set the GVRP registration mode to fixed on port Ethernet 1/1.
```

```
<Sysname> system-view  
[Sysname] interface ethernet 1/1  
[Sysname-Ethernet1/1] port link-type trunk  
[Sysname-Ethernet1/1] gvrp registration fixed
```

Related commands

display garp statistics

reset garp statistics

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.

Syntax

reset garp statistics [**interface** *interface-list*]

Views

User view

Default command level

2: System level

Parameters

interface *interface-list*: Clears the GARP statistics of one or multiple ports. You can specify up to 10 port lists, by each of which you can specify a single port in the form of *interface-type interface-number*, or 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*.

Usage guidelines

The cleared statistics include the statistics about GVRP PDUs sent, received, and dropped.

Examples

```
# Clear the GARP statistics on all ports.  
<Sysname> reset garp statistics
```

Related commands

display garp statistics

LLDP configuration commands

display lldp local-information

Use **display lldp local-information** to display the LLDP information to be sent. This information, contained in the LLDP TLVs, is sent to neighbor devices.

Syntax

```
display lldp local-information [ global | interface interface-type interface-number ] [ | { begin | exclude | include } regular-expression ]
```

Views

Any view

Default command 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.

Usage guidelines

If no keyword or argument is specified, this command displays all LLDP information to be sent. This information includes 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   : H3C Comware Platform Software
H3C Comware Platform Software
Comware Software Version 5.20, Demo 2304L01, Standard
Copyright(c) 2004-2017 New H3C Technologies Co., Ltd.

  System capabilities supported : Bridge,Router
  System capabilities enabled   : Bridge,Router

MED information
Device class: Connectivity device
```

```

HardwareRev          : REV.A
FirmwareRev         : 109
SoftwareRev         : 5.20 Alpha 2101
SerialNum           : NONE
Manufacturer name    : H3C
Model name          : H3C Comware
Asset tracking identifier : Unknown
LLDP local-information of port 1[Ethernet1/1]:
  Port ID subtype   : Interface name
  Port ID           : Ethernet1/1
  Port description  : Ethernet1/1 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

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

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         : Critical
Port available power value: 30.0(w)

```

Table 28 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: <ul style="list-style-type: none"> • Bridge—Switching is supported. • Router—Routing is supported.
System capabilities enabled	Enabled capabilities: <ul style="list-style-type: none"> • Bridge—Switching is enabled. • Router—Routing is enabled.
Device class	MED device class: <ul style="list-style-type: none"> • 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.
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: MAC address or Interface name .
Port ID	Port ID, the value of which depends on the port ID subtype.
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.
Auto-negotiation supported	Indicates whether auto-negotiation is supported on the port.
Auto-negotiation enabled	Indicates whether auto-negotiation is enabled on the port.
OperMau	Speed and duplex state of the port.
PoE supported	Indicates whether PoE is supported on the port.
Link aggregation supported	Indicates whether link aggregation is supported.
Link aggregation enabled	Indicates whether 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: <ul style="list-style-type: none"> • unknown.

Field	Description
	<ul style="list-style-type: none"> • voice. • voiceSignaling. • guestVoice. • guestVoiceSignaling. • softPhoneVoice. • videoconferencing. • streamingVideo. • videoSignaling.
Unknown Policy	Indicates whether the media policy is unknown.
VLAN tagged	Indicates whether 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	Location information format: <ul style="list-style-type: none"> • 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.
PoE PSE power source	PSE power type: <ul style="list-style-type: none"> • Unknown—Unknown power supply. • Primary—Primary power supply. • Backup—Backup power supply.
PoE PD power source	PD power type: <ul style="list-style-type: none"> • 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 PSE ports: <ul style="list-style-type: none"> • Unknown. • Critical. • High. • Low.
Port PD Priority	PoE power receiving priority of PD ports: <ul style="list-style-type: none"> • Unknown. • Critical. • High. • Low.
Port available power value	Available PoE power on PSE ports or power needed on PD ports, in watts.

display lldp neighbor-information

Use **display lldp neighbor-information** to display the LLDP information carried in LLDP TLVs sent from the neighboring devices.

Syntax

```
display lldp neighbor-information [ brief | interface interface-type interface-number [ brief ] | list  
[ system-name system-name ] ] [ { begin | exclude | include } regular-expression ]
```

Views

Any view

Default command 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.

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[Ethernet1/1]:
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            : Ethernet1/1
Port description   : Ethernet1/1 Interface
System name        : H3C
System description : H3C Comware Platform Software
System capabilities supported : Bridge,Router
System capabilities enabled   : 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

Link aggregation supported       : Yes
Link aggregation enabled        : No
Aggregation port ID             : 0

```

Maximum frame Size: 1536

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              Eth1/1           000f-e25d-ee91 Ethernet1/5
System2              Eth1/2           000f-e25d-ee92 Ethernet1/6
System3              Eth1/3           000f-e25d-ee93 Ethernet1/7

```

Table 29 Command output

Field	Description
LLDP neighbor-information of port 1	LLDP information received through port 1.
Update time	Time when LLDP information about a neighboring device was last updated.
Chassis type	Chassis ID representation: <ul style="list-style-type: none"> • Chassis component. • Interface alias. • Port component. • MAC address. • Network address(ipv4). • Interface name.

Field	Description
	<ul style="list-style-type: none"> • Locally assigned—Locally-defined chassis type other than those listed above.
Chassis ID	ID that identifies the LLDP sending device, which can be a MAC address, a network address, an interface or some other value depending on the chassis type.
Port ID type	Port ID representation: <ul style="list-style-type: none"> • Interface alias. • Port component. • MAC address. • Network address(ipv4). • Interface name. • Agent circuit ID. • Locally assigned—Locally-defined port ID type other than those listed above.
Port ID	Value of the port ID type.
System name	System name of the neighboring device.
System description	System description of the neighboring device.
System capabilities supported	Capabilities supported on the neighboring device: <ul style="list-style-type: none"> • Bridge—Switching is supported. • Router—Routing is supported.
System capabilities enabled	Capabilities enabled on the neighboring device: <ul style="list-style-type: none"> • Bridge—Switching is enabled. • Router—Routing is enabled.
Management address OID	Management address object ID.
Port and protocol VLAN ID(PPVID)	Port protocol VLAN ID.
Port and protocol VLAN supported	Indicates whether protocol VLAN is supported on the port.
Port and protocol VLAN enabled	Indicates whether protocol VLAN is enabled on the port.
VLAN name of VLAN 1	Name of VLAN 1.
Auto-negotiation supported	Indicates whether auto-negotiation is supported on the port.
Auto-negotiation enabled	Indicates whether auto-negotiation is enabled on the port.
OperMau	Speed and duplex state on the port.
Power port class	PoE device type: <ul style="list-style-type: none"> • PSE—Power sourcing equipment. • PD—Powered device.
PSE power supported	Indicates whether the device can operate as a PSE.
PSE power enabled	Indicates whether the device is operating as a PSE.
PSE pairs control ability	Indicates whether the PSE-PD pair control is available.
Power pairs	PoE mode: <ul style="list-style-type: none"> • Signal—PoE via signal lines. • Spare—PoE via spare lines.
Port power classification	Port power classification of the PD: <ul style="list-style-type: none"> • Class 0. • Class 1.

Field	Description
	<ul style="list-style-type: none"> • Class 2. • Class 3. • Class 4.
Link aggregation supported	Indicates whether link aggregation is supported.
Link aggregation enabled	Indicates whether link aggregation is enabled.
Aggregation port ID	Aggregation group ID, which is 0 when link aggregation is disabled.
Location format	Location information format: <ul style="list-style-type: none"> • 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.
PoE PSE power source	PSE power type: <ul style="list-style-type: none"> • Unknown—Unknown power supply. • Primary—Primary power supply. • Backup—Backup power supply.
PoE PD power source	PD power type: <ul style="list-style-type: none"> • 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 PSE ports: <ul style="list-style-type: none"> • Unknown. • Critical. • High. • Low.
Port PD Priority	PoE power receiving priority of PD ports: <ul style="list-style-type: none"> • Unknown. • Critical. • High. • Low.
Port available power value	Available PoE power on PSE ports, or power needed on PD ports, in watts.
TLV type	Unknown basic TLV type.
TLV information	Information contained in the unknown basic TLV type.
Unknown organizationally-defined TLV	Unknown organizationally specific TLV.
TLV OUI	OUI of the unknown organizationally specific TLV.
TLV subtype	Unknown organizationally specific TLV subtype.
Index	Unknown organization index.
TLV information	Information contained in unknown organizationally specific TLV.
Local Interface	Local port that receives the LLDP information.

display lldp statistics

Use **display lldp statistics** to display the global LLDP statistics or the LLDP statistics of a port.

Syntax

```
display lldp statistics [ global | interface interface-type interface-number ] [ | { begin | exclude | include } regular-expression ]
```

Views

Any view

Default command 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.

Usage guidelines

If no keyword or argument is specified, this command displays the global LLDP statistics and the LLDP statistics of all ports.

Examples

```
# Display the global LLDP statistics and 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 [Ethernet1/1]:
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
```

Table 30 Command output

Field	Description
LLDP statistics global information	Global LLDP statistics.

Field	Description
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

Use **display lldp status** to display LLDP status information of a port.

Syntax

```
display lldp status [ interface interface-type interface-number ] [ [ { begin | exclude | include } regular-expression ]
```

Views

Any view

Default command 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.

Usage guidelines

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 and 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,4 minutes,40 seconds
Transmit interval           : 30s
Hold multiplier             : 4
Reinit delay                : 2s
Transmit delay              : 2s
Trap interval               : 5s
Fast start times            : 3
Port 1 [Ethernet1/1]:
Port status of LLDP        : Enable
```

```

Admin status           : Tx_Rx
Trap flag             : No
Polling interval      : 0s

Number of neighbors   : 5
Number of MED neighbors : 2
Number of sent optional TLV : 12
Number of received unknown TLV : 5

```

Table 31 Command output

Field	Description
Global status of LLDP	Indicates whether 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 LLDP is enabled on the port.
Admin status	LLDP mode of the port: <ul style="list-style-type: none"> • TxRx—The port can send and receive LLDPDUs. • Rx_Only—The port can only receive LLDPDUs. • Tx_Only—The port can only send LLDPDUs. • Disable—The port cannot send or receive LLDPDUs.
Trap Flag	Indicates whether 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 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

Use **display lldp tlv-config** to display the types of advertisable optional LLDP TLVs of a port.

Syntax

```

display lldp tlv-config [ interface interface-type interface-number ] [ { begin | exclude | include }
regular-expression ]

```

Views

Any view

Default command 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.

Usage guidelines

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 Ethernet 1/1.

```
<Sysname> display lldp tlv-config interface ethernet 1/1
```

```
LLDP tlv-config of port 1[Ethernet1/1]:
```

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 32 Command output

Field	Description
LLDP tlv-config of port 1	Advertisable optional TLVs of port 1.
NAME	TLV type.
STATUS	Indicates whether a specific type of TLV is sent through a port.
DEFAULT	Indicates whether a specific type of TLV is sent through a port by default.
Basic optional TLV	Basic TLVs: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • Port VLAN ID TLV. • Port and protocol VLAN ID TLV. • VLAN name TLV.
IEEE 802.3 extended TLV	IEEE 802.3 organizationally specific TLVs: <ul style="list-style-type: none"> • MAC-Physic TLV. • Power via MDI TLV. • Link aggregation TLV. • Maximum frame size TLV.
LLDP-MED extend TLV	LLDP-MED TLVs: <ul style="list-style-type: none"> • 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.

Ildp admin-status

Use **Ildp admin-status** to specify the LLDP operating mode for a port or all ports in a port group.

Use **undo Ildp admin-status** to restore the default LLDP operating mode.

Syntax

```
Ildp admin-status { disable | rx | tx | txrx }
```

```
undo Ildp admin-status
```

Default

The LLDP operating mode is **TxRx**.

Views

Layer 2 Ethernet interface view, Layer 3 Ethernet interface view, port group view

Default command 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.

Examples

```
# Configure the LLDP operating mode as Rx for Ethernet 1/1.
```

```
<Sysname> system-view
[Sysname] interface ethernet 1/1
[Sysname-Ethernet1/1] lldp admin-status rx
```

Ildp check-change-interval

Use **lldp check-change-interval** to enable LLDP polling and to set the polling interval.

Use **undo lldp check-change-interval** to restore the default.

Syntax

lldp check-change-interval *interval*

undo lldp check-change-interval

Default

LLDP polling is disabled.

Views

Layer 2 Ethernet interface view, Layer 3 Ethernet interface view, port group view

Default command level

2: System level

Parameters

interval: Sets the LLDP polling interval in the range of 1 to 30 seconds.

Examples

```
# Enable LLDP polling on Ethernet 1/1, setting the polling interval to 30 seconds.
```

```
<Sysname> system-view
[Sysname] interface ethernet 1/1
[Sysname-Ethernet1/1] lldp check-change-interval 30
```

Ildp enable

Use **lldp enable** to enable LLDP.

Use **undo lldp enable** to disable LLDP.

Syntax

lldp enable

undo lldp enable

Default

LLDP is enabled on a port and is globally disabled.

Views

System view, Layer 2 Ethernet interface view, Layer 3 Ethernet interface view, port group view

Default command level

2: System level

Usage guidelines

LLDP takes effect on a port only when LLDP is enabled both globally and on the port.

Examples

```
# Disable LLDP on Ethernet 1/1.
<Sysname> system-view
[Sysname] interface ethernet 1/1
[Sysname-Ethernet1/1] undo lldp enable
```

Ildp encapsulation snap

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.

Syntax

lldp encapsulation snap

undo lldp encapsulation

Default

Ethernet II is the encapsulation format for LLDPDUs.

Views

Layer 2 Ethernet interface view, Layer 3 Ethernet interface view, port group view

Default command level

2: System level

Examples

```
# Configure the encapsulation format for LLDPDUs as SNAP on Ethernet 1/1.
<Sysname> system-view
[Sysname] interface ethernet 1/1
[Sysname-Ethernet1/1] lldp encapsulation snap
```

Ildp fast-count

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.

Syntax

lldp fast-count *count*

undo lldp fast-count

Default

The number is 3.

Views

System view

Default command level

2: System level

Parameters

count: Sets the number of the LLDPDUs sent each time fast LLDPDU transmission is triggered. The value range is 1 to 10.

Examples

```
# Configure the device to send four LLDPDUs each time fast LLDPDU transmission is triggered.
<Sysname> system-view
[Sysname] lldp fast-count 4
```

Ildp hold-multiplier

Use **lldp hold-multiplier** to set the TTL multiplier.

Use **undo lldp hold-multiplier** to restore the default.

Syntax

```
lldp hold-multiplier value
undo lldp hold-multiplier
```

Default

The TTL multiplier is 4.

Views

System view

Default command level

2: System level

Parameters

value: Sets the TTL multiplier in the range of 2 to 10.

Usage guidelines

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 expression:

TTL multiplier × LLDPDU transmit interval

The TTL can be up to 65535 seconds. Longer TTLs will be rounded off to 65535 seconds.

Examples

```
# Set the TTL multiplier to 6.
<Sysname> system-view
[Sysname] lldp hold-multiplier 6
```

Related commands

lldp timer tx-interval

Ildp management-address-format string

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.

Syntax

lldp management-address-format string

undo lldp management-address-format

Default

The management address is encapsulated in the form of numbers in TLVs.

Views

Layer 2 Ethernet interface view, Layer 3 Ethernet interface view, port group view

Default command level

2: System level

Examples

```
# Configure Ethernet 1/1 to encapsulate the management address in the form of strings in management address TLVs.
```

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

```
[Sysname] interface ethernet 1/1
```

```
[Sysname-Ethernet1/1] lldp management-address-format string
```

Ildp management-address-tlv

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.

Syntax

lldp management-address-tlv [*ip-address*]

undo lldp management-address-tlv

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. For a Layer 3 Ethernet port, the management address is its own IP address. If no IP address is configured for the Layer 3 Ethernet port, no management address will be advertised.

Views

Layer 2 Ethernet interface view, Layer 3 Ethernet interface view, port group view

Default command level

2: System level

Parameters

ip-address: Specifies a management address to be advertised in LLDPDUs.

Usage guidelines

An LLDPDU carries only one management address TLV. If you set the management address multiple times, the most recent configuration 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.

In Layer 3 Ethernet interface view, if you run the **lldp management-address-tlv** command without specifying the *ip-address* argument, the advertised management address is the IP address of the Layer 3 Ethernet port. If no IP address is configured for the port, no management address will be advertised.

Examples

```
# Set the management address to 192.6.0.1 for Ethernet 1/1.
<Sysname> system-view
[Sysname] interface ethernet 1/1
[Sysname-Ethernet1/1] lldp management-address-tlv 192.6.0.1
```

Ildp notification remote-change enable

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.

Syntax

```
lldp notification remote-change enable
undo lldp notification remote-change enable
```

Default

LLDP trapping is disabled on ports.

Views

Layer 2 Ethernet interface view, Layer 3 Ethernet interface view, port group view

Default command level

2: System level

Examples

```
# Enable LLDP trapping for Ethernet 1/1.
<Sysname> system-view
[Sysname] interface ethernet 1/1
[Sysname-Ethernet1/1] lldp notification remote-change enable
```

Ildp timer notification-interval

Use **lldp timer notification-interval** to set the LLDP trap transmit interval.

Use **undo lldp timer notification-interval** to restore the default.

Syntax

```
lldp timer notification-interval interval
undo lldp timer notification-interval
```

Default

The LLDP trap transmit interval is 5 seconds.

Views

System view

Default command level

2: System level

Parameters

interval: Sets the LLDP trap transmit interval in the range of 5 to 3600 seconds.

Examples

```
# Set the LLDP trap transmit interval to 8 seconds.
<Sysname> system-view
[Sysname] lldp timer notification-interval 8
```

Ildp timer reinit-delay

Use **lldp timer reinit-delay** to set the LLDP re-initialization delay.

Use **undo lldp timer reinit-delay** to restore the default.

Syntax

```
lldp timer reinit-delay delay
undo lldp timer reinit-delay
```

Default

The LLDP re-initialization delay is 2 seconds.

Views

System view

Default command level

2: System level

Parameters

delay: Sets the LLDP re-initialization delay in the range of 1 to 10 seconds.

Examples

```
# Set the LLDP re-initialization delay to 4 seconds.
<Sysname> system-view
[Sysname] lldp timer reinit-delay 4
```

Ildp timer tx-delay

Use **lldp timer tx-delay** to set the LLDPDU transmit delay.

Use **undo lldp timer tx-delay** to restore the default.

Syntax

```
lldp timer tx-delay delay
undo lldp timer tx-delay
```

Default

The LLDPDU transmit delay is 2 seconds.

Views

System view

Default command level

2: System level

Parameters

delay: Sets the LLDPDU transmit delay in the range of 1 to 8192 seconds.

Usage guidelines

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 LLDPDU transmit delay as the transmit interval.

Examples

```
# Set the LLDPDU transmit delay to 4 seconds.
```

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

```
[Sysname] lldp timer tx-delay 4
```

Related commands

lldp timer tx-interval

lldp timer tx-interval

Use **lldp timer tx-interval** to set the LLDPDU transmit interval.

Use **undo lldp timer tx-interval** to restore the default.

Syntax

```
lldp timer tx-interval interval
```

```
undo lldp timer tx-interval
```

Default

The LLDPDU transmit interval is 30 seconds.

Views

System view

Default command level

2: System level

Parameters

interval: Sets the LLDPDU transmit interval in the range of 5 to 32768 seconds.

Usage guidelines

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 LLDPDU transmit delay as the transmit interval.

Examples

```
# Set the LLDPDU transmit interval to 20 seconds.
<Sysname> system-view
[Sysname] lldp timer tx-interval 20
```

Related commands

lldp timer tx-delay

lldp tlv-enable

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.

Syntax

In Layer 2 Ethernet interface view or port group view:

```
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 } }
```

In Layer 3 Ethernet interface view:

```
lldp tlv-enable { basic-tlv { all | port-description | system-capability | system-description | system-name } } | 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 } } | power-over-ethernet } }
```

```
undo lldp tlv-enable { basic-tlv { all | port-description | system-capability | system-description | system-name } } | dot3-tlv { all | link-aggregation | mac-physic | max-frame-size | power } } | med-tlv { all | capability | inventory | location-id | power-over-ethernet } }
```

Default

The device can advertise on a Layer 2 Ethernet port all types of LLDP TLVs, except location identification TLVs, and advertise on a Layer 3 Ethernet port all types of LLDP TLVs, except IEEE 802.1 organizationally specific TLVs, network policy TLVs, and location identification TLVs.

Views

Layer 2 Ethernet interface view, Layer 3 Ethernet interface view, port group view

Default command 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** in Layer 2 Ethernet interface view; advertises all basic LLDP TLVs or IEEE 802.3 organizationally specific LLDP TLVs when the **all** keyword is specified for **basic-tlv** or **dot3-tlv** in Layer 3 Ethernet interface view; or advertises all LLDP-MED TLVs except location identification TLVs when the **all** keyword is specified for **med-tlv**, regardless of whether in Layer 2 or Layer 3 Ethernet interface view.

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 a VLAN ID in the TLVs to be advertised. The VLAN ID is in the range of 1 to 4094, and the default is the lowest VLAN ID on the port.

vlan-name [*vlan-id*]: Advertises VLAN name TLVs. The *vlan-id* argument specifies a VLAN ID in the TLVs to be advertised. The VLAN ID is in the range of 1 to 4094, and the default is the lowest 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 in the range of 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 value in the range of 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.

Usage guidelines

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 multiple times without the **all** keyword specified.

Examples

```
# Enable the device to advertise link aggregation TLVs of the IEEE 802.3 organizationally specific TLVs on Ethernet 1/1.
```

```
<Sysname> system-view
[Sysname] interface ethernet 1/1
[Sysname-Ethernet1/1] lldp tlv-enable dot3-tlv link-aggregation
```

Ildp voice-vlan

Use **lldp voice-vlan** to specify the VLAN ID that an interface sends to the IP phone in the LLDP-MED network policy TLV.

Use **undo lldp voice-vlan** to restore the default.

Syntax

```
lldp voice-vlan vlan-id
```

```
undo lldp voice-vlan
```

Default

The interface sends its voice VLAN ID in the LLDP-MED network policy TLV to the IP phone.

Views

Layer 2 Ethernet interface view, port group view

Default command level

2: System level

Parameters

vlan-id: Specifies a VLAN ID in the range of 1 to 4094.

Examples

```
# Specify the VLAN ID that the interface sends to the IP phone as 4094.
```

```
<Sysname> system-view
[Sysname] interface ethernet 0/1
[Sysname-Ethernet0/1] lldp voice-vlan 4094
```

Port isolation configuration commands

The H3C MSR series routers support only one isolation group that is created automatically as isolation group 1. You can neither remove the isolation group nor create other isolation groups.

display port-isolate group

Use **display port-isolate group** to display information about port isolation group 1.

Syntax

```
display port-isolate group [ | { begin | exclude | include } regular-expression ]
```

Views

Any view

Default command 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.

Examples

```
# Display port isolation group information.
```

```
<Sysname> display port-isolate group
```

```
Port-isolate group information:
```

```
Uplink port support: NO
```

```
Group ID: 1
```

```
Group members:
```

```
 Ethernet1/2
```

Table 33 Command output

Field	Description
Port-isolate group information	Displays port isolation group information.
Uplink port support	The isolation group does not support the uplink port. This field always displays NO .
Group ID	Isolation group number, which is always 1.
Group members	Isolated ports in the isolation group.

port-isolate enable

Use **port-isolate enable** to assign ports to the isolation group.

Use **undo port-isolate enable** to remove ports from the isolation group.

Syntax

port-isolate enable

undo port-isolate enable

Views

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

Default command level

2: System level

Usage guidelines

The following matrix shows the command and hardware compatibility in Layer 2 aggregate interface view:

Hardware	Command compatibility
MSR800	No
MSR 900	No
MSR900-E	No
MSR 930	No
MSR 20-1X	No
MSR 20	No
MSR 30	Yes
MSR 50	Yes
MSR 2600	Yes
MSR3600-51F	Yes

To assign Ethernet ports to the isolation group one by one, perform the command in Layer 2 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 device 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 device 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 Ethernet 1/1 and Ethernet 1/2 to the isolation group.

```
<Sysname> system-view
[Sysname] interface ethernet 1/1
[Sysname-Ethernet1/1] port-isolate enable
[Sysname-Ethernet1/1] quit
[Sysname] interface ethernet 1/2
[Sysname-Ethernet1/2] 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 ethernet 1/1
[Sysname-port-group-manual-aa] group-member ethernet 1/2
[Sysname-port-group-manual-aa] group-member ethernet 1/3
[Sysname-port-group-manual-aa] group-member ethernet 1/4
[Sysname-port-group-manual-aa] port-isolate enable
```

Assign Layer 2 aggregate interface Bridge-Aggregation 1 and its member ports to the isolation group.

```
<Sysname> system-view
[Sysname] interface bridge-aggregation 1
[Sysname-Bridge-Aggregation1] quit
[Sysname] interface Ethernet 1/1
[Sysname-Ethernet1/1] port link-aggregation group 1
[Sysname-Ethernet1/1] quit
[Sysname] interface Ethernet 1/2
[Sysname-Ethernet1/2] port link-aggregation group 1
[Sysname-Ethernet1/2] quit
[Sysname] interface bridge-aggregation 1
[Sysname-Bridge-Aggregation1] port-isolate enable
```

VLAN termination configuration commands

dot1q ethernet-type

Use **dot1q ethernet-type** to set the TPID value in the outermost VLAN tag of packets received and sent by the interface.

Use **undo dot1q ethernet-type** to restore the default.

Syntax

dot1q ethernet-type *hex-value*

undo dot1q ethernet-type

Default

The TPID value for the outmost VLAN tag of VLAN-tagged packets received and sent by the interface is 0x8100.

Views

Layer 3 Ethernet interface view, Layer 3 aggregate interface view, Layer 3 VE interface view, VE-L3VPN-Access interface view

Default command level

2: System level

Parameters

hex-value: Sets the hexadecimal tag protocol identifier (TPID) value, in the range of 0x1 to 0xFFFF and excluding the common protocol type values listed in [Table 34](#).

Table 34 Common protocol type values

Protocol	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 on the device	0xFFFFD/0xFFFFE/0xFFFF

Usage guidelines

After you execute the **dot1q ethernet-type** command, only packets whose TPID in the outermost VLAN tag is 0x8100 or the value you configured will be processed as VLAN-tagged packets. When sending a packet, the interface sets the TPID value in the outermost VLAN tag to the configured value, and sets the TPID values in the other VLAN tags to 0x8100 if the packet carries two or more layers of VLAN tags.

A Layer 3 Ethernet interface configured with this command cannot be added to an aggregation group.

Configurations made in interface view apply to all subinterfaces.

Executing this command on an up interface will quickly shut down and then bring up the interface.

Examples

Set the TPID value in the outermost VLAN tag of VLAN-tagged packets that can be received and sent by the subinterfaces of Ethernet 1/1 to 0x9100.

```
<Sysname> system-view
[Sysname] interface ethernet 1/1
[Sysname-Ethernet1/1] dot1q ethernet-type 9100
```

vlan-type dot1q vid

Use **vlan-type dot1q vid** to enable Dot1q termination on the interface, and specify the outermost VLAN ID in the VLAN-tagged packets that can be terminated by the subinterface.

Use **undo vlan-type dot1q vid** to disable Dot1q termination on the interface.

Syntax

```
vlan-type dot1q vid vlan-id
undo vlan-type dot1q vid vlan-id
```

Default

Dot1q termination is disabled on subinterfaces.

Views

Layer 3 Ethernet subinterface view, Layer 3 aggregate subinterface view, Layer 3 VE subinterface view, VE-L3VPN-Access subinterface view

Default command level

2: System level

Parameters

vlan-id: Specifies the VLAN ID in the range of 1 to 4094.

Usage guidelines

You cannot configure multiple subinterfaces under an Ethernet interface to terminate VLAN-tagged packets from the same VLAN. The VLAN IDs specified for different subinterfaces under the Ethernet interface cannot be the same.

After you use the **undo vlan-type dot1q vid** command to disable Dot1q termination on the subinterface, the subinterface will restart, and the ARP table entry corresponding to the subinterface will be removed.

Examples

Configure Ethernet 1/1.1 to terminate VLAN-tagged packets with VLAN ID 2.

```
<Sysname> system-view
[Sysname] interface ethernet 1/1.1
```

```
[Sysname-Ethernet1/1.1] vlan-type dot1q vid 2
# Configure Virtual-Ethernet 1.1 to terminate VLAN-tagged packets with VLAN ID 2.
<Sysname> system-view
[Sysname] interface virtual-ethernet 1.1
[Sysname-Virtual-Ethernet1.1] vlan-type dot1q vid 2
```

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