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# **ZebOS-XP®**

## **Network Platform**

**Version 1.4**

**Extended Performance**

**Layer 2 Command Reference**

**December 2015**

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# Preface

---

This document describes the ZebOS-XP commands for Layer 2 protocols.

---

## Audience

This document is intended for network administrators and other engineering professionals who configure and manage Layer 2 protocols.

---

## Conventions

Table P-1 shows the conventions used in this guide.

**Table P-1: Conventions**

Convention	Description
<i>Italics</i>	Emphasized terms; titles of books
Note:	Special instructions, suggestions, or warnings
<code>monospaced type</code>	Code elements such as commands, functions, parameters, files, and directories

---

## Contents

This document contains these chapters and appendices:

- [Chapter 1, Command Line Interface](#)
- [Chapter 2, Common Commands](#)
- [Chapter 3, Bridge Commands](#)
- [Chapter 4, Spanning Tree Protocol Commands](#)
- [Chapter 5, RPVST+ Commands](#)
- [Chapter 6, 802.1x Commands](#)
- [Chapter 7, Link Aggregation Control Protocol Commands](#)
- [Chapter 8, Multi-Chassis Link Aggregation Commands](#)
- [Chapter 9, GMRP Commands](#)
- [Chapter 10, GVRP Commands](#)
- [Chapter 11, MMRP Commands](#)
- [Chapter 12, MVRP Commands](#)
- [Chapter 13, VLAN and Private VLAN Commands](#)

- [Appendix A, spanning-tree Commands](#)

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## Related Documents

The following guides are related to this document:

- *Layer 2 Configuration Guide*
- *Layer 2 Developer Guide*
- *Installation Guide*

Note: All ZebOS-XP technical manuals are available to licensed customers at [http://www.ipinfusion.com/support/document\\_list](http://www.ipinfusion.com/support/document_list).

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# CHAPTER 1 Command Line Interface

---

This chapter introduces the ZebOS-XP Command Line Interface (CLI) and how to use its features.

---

## Overview

You use the CLI to configure, monitor, and maintain ZebOS-XP devices. The CLI is text-based and each command is usually associated with a specific task.

You can give the commands described in this manual locally from the console of a device running ZebOS-XP or remotely from a terminal emulator such as `putty` or `xterm`. You can also use the commands in scripts to automate configuration tasks.

---

## Starting the Command Line Interface

You must start daemons as described in this section before you can use the CLI. The general steps are listed below. For details about the ZebOS-XP daemons, see the *Installation Guide*.

1. Start your terminal emulator and connect to the device or go to the console of the device running ZebOS-XP.
2. Connect to the directory where you installed the ZebOS-XP executables.
3. Start the Network Services Module (NSM).

```
# ./nsm -d
```

4. Start the protocol module daemons that your organization uses, such as `mstpd`, `ospf6d`, or `ripd`.

```
# ./mstpd -d
```

5. Start the Integrated Management Interface (IMI) daemon.

```
# ./imi -d
```

6. Start the IMI shell.

```
# ./imish
```

**Note:** Your organization may use a ZebOS-XP build that does not include `imish`. If that is the case, you must connect to a port on which a protocol daemon is listening. For details, see the *Installation Guide*.

You can now begin using the CLI.

---

## Command Line Interface Help

You access the CLI help by entering a full or partial command string and a question mark “?”. The CLI displays the command keywords or parameters along with a short description. For example, at the CLI command prompt, type:

```
> show ?
```

The CLI displays this keyword list with short descriptions for each keyword:

```
show ?
  application-priority      Application Priority
```

arp	Internet Protocol (IP)
bfd	Bidirectional Forwarding Detection (BFD)
bgp	Border Gateway Protocol (BGP)
bi-lsp	Bi-directional lsp status and configuration
bridge	Bridge group commands
ce-vlan	COS Preservation for Customer Edge VLAN
class-map	Class map entry
cli	Show CLI tree of current mode
clns	Connectionless-Mode Network Service (CLNS)
control-adjacency	Control Adjacency status and configuration
control-channel	Control Channel status and configuration
cspf	CSPF Information
customer	Display Customer spanning-tree
cvlan	Display CVLAN information
debugging	Debugging functions (see also 'undebug')
dot1x	IEEE 802.1X Port-Based Access Control
etherchannel	LACP etherchannel
ethernet	Layer-2
...	

If you type the ? in the middle of a keyword, the CLI displays help for that keyword only.

```
> show de?
debugging  Debugging functions (see also 'undebug')
```

If you type the ? in the middle of a keyword, but the incomplete keyword matches several other keywords, ZebOS-XP displays help for all matching keywords.

```
> show i? (CLI does not display the question mark).
interface  Interface status and configuration
ip          IP information
isis       ISIS information
```

---

## Command Completion

The CLI can complete the spelling of a command or a parameter. Begin typing the command or parameter and then press the tab key. For example, at the CLI command prompt type `sh`:

```
> sh
```

Press the tab key. The CLI displays:

```
> show
```

If the spelling of a command or parameter is ambiguous, the CLI displays the choices that match the abbreviation. Type `show i` and press the tab key. The CLI displays:

```
> show i
interface  ip          ipv6      isis
> show i
```

The CLI displays the `interface` and `ip` keywords. Type `n` to select `interface` and press the tab key. The CLI displays:

```
> show in
> show interface
```

Type `?` and the CLI displays the list of parameters for the `show interface` command.

```
> show interface
IFNAME  Interface name
|       Output modifiers
```

```
>          Output redirection
<cr>
```

The CLI displays the only parameter associated with this command, the `IFNAME` parameter.

---

## Command Abbreviations

The CLI accepts abbreviations that uniquely identify a keyword in commands. For example:

```
> sh in eth0
```

is an abbreviation for:

```
> show interface eth0
```

---

## Command Line Errors

Any unknown spelling causes the CLI to display the error `Unrecognized command` in response to the `?`. The CLI displays the command again as last entered.

```
> show dd?
% Unrecognized command
> show dd
```

When you press the Enter key after typing an invalid command, the CLI displays:

```
(config)#router ospf here
                        ^
% Invalid input detected at '^' marker.
```

where the `^` points to the first character in error in the command.

If a command is incomplete, the CLI displays the following message:

```
> show
% Incomplete command.
```

Some commands are too long for the display line and can wrap mid-parameter or mid-keyword, as shown below. This does *not* cause an error and the command performs as expected:

```
area 10.10.0.18 virtual-link 10.10.0.19 authent
ication-key 57393
```

---

## Command Negation

Many commands have a `no` form that resets a feature to its default value or disables the feature. For example:

- The `ip address` command assigns an IPv4 address to an interface
- The `no ip address` command removes an IPv4 address from an interface

## Syntax Conventions

Table 1-1 describes the conventions used to represent command syntax in this reference.

**Table 1-1: Syntax conventions**

Convention	Description	Example
monospaced font	Command strings entered on a command line	<code>show spanning-tree</code>
lowercase	Keywords that you enter exactly as shown in the command syntax.	<code>show spanning-tree</code>
UPPERCASE	See <a href="#">Variable Placeholders</a>	<code>IFNAME</code>
( )	Optional parameters, from which you must select one. Vertical bars delimit the selections. Do not enter the parentheses or vertical bars as part of the command.	<code>(A.B.C.D &lt;0-4294967295&gt;)</code>
( )	Optional parameters, from which you select one or none. Vertical bars delimit the selections. Do not enter the parentheses or vertical bars as part of the command.	<code>(A.B.C.D &lt;0-4294967295&gt; )</code>
( )	Optional parameter which you can specify or omit. Do not enter the parentheses or vertical bar as part of the command.	<code>(IFNAME )</code>
{ }	Optional parameters, from which you must select one or more. Vertical bars delimit the selections. Do not enter the braces or vertical bars as part of the command.	<code>{intra-area &lt;1-255&gt; inter-area &lt;1-255&gt; external &lt;1-255&gt;}</code>
[ ]	Optional parameters, from which you select zero or more. Vertical bars delimit the selections. Do not enter the brackets or vertical bars as part of the command. A '?' before a parameter in square brackets limits that parameter to one occurrence in a command string.	<code>[&lt;1-65535&gt; AA:NN internet local-AS no-advertise no-export]</code>
.	Repeatable parameter. The parameter that follows a period can be repeated more than once. Do not enter the period as part of the command.	<code>set as-path prepend .&lt;1-65535&gt;</code>



---

## Variable Placeholders

Table 1-2 shows the tokens used in command syntax use to represent variables for which you supply a value.

**Table 1-2: Variable placeholders**

Token	Description
WORD	A contiguous text string (excluding spaces)
LINE	A text string, including spaces; no other parameters can follow this parameter
IFNAME	Interface name whose format varies depending on the platform; examples are: <code>eth0</code> , <code>Ethernet0</code> , <code>ethernet0</code> , <code>xe0</code>
A.B.C.D	IPv4 address
A.B.C.D/M	IPv4 address and mask/prefix
X:X::X:X	IPv6 address
X:X::X:X/M	IPv6 address and mask/prefix
HH:MM:SS	Time format
AA:NN	BGP community value
XX:XX:XX:XX:XX:XX	MAC address
<1-5> <1-65535> <0-2147483647> <0-4294967295>	Numeric range

---

## Command Description Format

Table 1-3 explains the sections used to describe each command in this reference.

**Table 1-3: Command descriptions**

Section	Description
<b>Command Name</b>	The name of the command, followed by what the command does and when should it be used
<b>Command Syntax</b>	The syntax of the command
<b>Parameters</b>	Parameters and options for the command
<b>Default</b>	The state before the command is executed
<b>Command Mode</b>	The mode in which the command runs; see <a href="#">Command Modes</a>
<b>Example</b>	An example of the command being executed

---

## Keyboard Operations

Table 1-4 lists the operations you can perform from the keyboard.

**Table 1-4: Keyboard operations**

Key combination	Operation
Left arrow or Ctrl+b	Moves one character to the left. When a command extends beyond a single line, you can press left arrow or Ctrl+b repeatedly to scroll toward the beginning of the line, or you can press Ctrl+a to go directly to the beginning of the line.
Right arrow or Ctrl-f	Moves one character to the right. When a command extends beyond a single line, you can press right arrow or Ctrl+f repeatedly to scroll toward the end of the line, or you can press Ctrl+e to go directly to the end of the line.
Esc, b	Moves back one word
Esc, f	Moves forward one word
Ctrl+e	Moves to end of the line
Ctrl+a	Moves to the beginning of the line
Ctrl+u	Deletes the line
Ctrl+w	Deletes from the cursor to the previous whitespace
Alt+d	Deletes the current word
Ctrl+k	Deletes from the cursor to the end of line
Ctrl+y	Pastes text previously deleted with Ctrl+k, Alt+d, Ctrl+w, or Ctrl+u at the cursor

**Table 1-4: Keyboard operations (Continued)**

Key combination	Operation
Ctrl+t	Transposes the current character with the previous character
Ctrl+c	Ignores the current line and redisplay the command prompt
Ctrl+z	Ends configuration mode and returns to exec mode
Ctrl+l	Clears the screen
Up Arrow or Ctrl+p	Scroll backward through command history
Down Arrow or Ctrl+n	Scroll forward through command history

---

## Show Command Modifiers

You can use two tokens to modify the output of a `show` command. Enter a question mark to display these tokens:

```
# show users ?
  | Output modifiers
  > Output redirection
```

You can type the | (vertical bar character) to use output modifiers. For example:

```
> show rsvp | ?
begin      Begin with the line that matches
exclude    Exclude lines that match
include     Include lines that match
redirect   Redirect output
```

---

## Begin Modifier

The `begin` modifier displays the output beginning with the first line that contains the input string (everything typed after the `begin` keyword). For example:

```
# show run | begin eth1
...skipping
interface eth1
  ipv6 address fe80::204:75ff:fee6:5393/64
!
interface eth2
  ipv6 address fe80::20d:56ff:fe96:725a/64
!
line con 0
  login
!
end
```

You can specify a regular expression after the `begin` keyword. This example begins the output at a line with either “eth3” or “eth4”:

```
# show run | begin eth[3-4]

...skipping
interface eth3
```

```
shutdown
!
interface eth4
shutdown
!
interface svlan0.1
no shutdown
!
route-map myroute permit 3
!
route-map mymap1 permit 10
!
route-map rmap1 permit 3
!
line con 0
login
line vty 0 4
login
!
end
```

---

### Include Modifier

The `include` modifier includes only those lines of output that contain the input string. In the output below, all lines containing the word “input” are included:

```
# show interface eth1 | include input
input packets 80434552, bytes 2147483647, dropped 0, multicast packets 0
input errors 0, length 0, overrun 0, CRC 0, frame 0, fifo 1, missed 0
```

You can specify a regular expression after the `include` keyword. This examples includes all lines with “input” or “output”:

```
#show int eth0 | include (in|out)put
input packets 597058, bytes 338081476, dropped 0, multicast packets 0
input errors 0, length 0, overrun 0, CRC 0, frame 0, fifo 0, missed 0
output packets 613147, bytes 126055987, dropped 0
output errors 0, aborted 0, carrier 0, fifo 0, heartbeat 0, window 0
```

---

### Exclude Modifier

The `exclude` modifier excludes all lines of output that contain the input string. In the following output example, all lines containing the word “input” are excluded:

```
# show interface eth1 | exclude input
Interface eth1
Scope: both
Hardware is Ethernet, address is 0004.75e6.5393
index 3 metric 1 mtu 1500 <UP,BROADCAST,RUNNING,MULTICAST>
VRF Binding: Not bound
Administrative Group(s): None
DSTE Bandwidth Constraint Mode is MAM
inet6 fe80::204:75ff:fee6:5393/64
output packets 4438, bytes 394940, dropped 0
output errors 0, aborted 0, carrier 0, fifo 0, heartbeat 0, window 0
collisions 0
```

You can specify a regular expression after the `exclude` keyword. This example excludes lines with “output” or “input”:

```
# show interface eth0 | exclude (in|out)put
Interface eth0
  Scope: both
  Hardware is Ethernet Current HW addr: 001b.2139.6c4a
  Physical:001b.2139.6c4a Logical:(not set)
  index 2 metric 1 mtu 1500 duplex-full arp ageing timeout 3000
  <UP,BROADCAST,RUNNING,MULTICAST>
  VRF Binding: Not bound
  Bandwidth 100m
  DHCP client is disabled.
  inet 10.1.2.173/24 broadcast 10.1.2.255
  VRRP Master of : VRRP is not configured on this interface.
  inet6 fe80::21b:21ff:fe39:6c4a/64
  collisions 0
```

---

## Redirect Modifier

The `redirect` modifier writes the output into a file. The output is not displayed.

```
# show history | redirect /var/frame.txt
```

The output redirection token (`>`) does the same thing:

```
# show history >/var/frame.txt
```

---

## Command Modes

Commands are grouped into modes arranged in a hierarchy. Each mode has its own set of commands. [Table 1-5](#) lists the command modes common to all protocols.

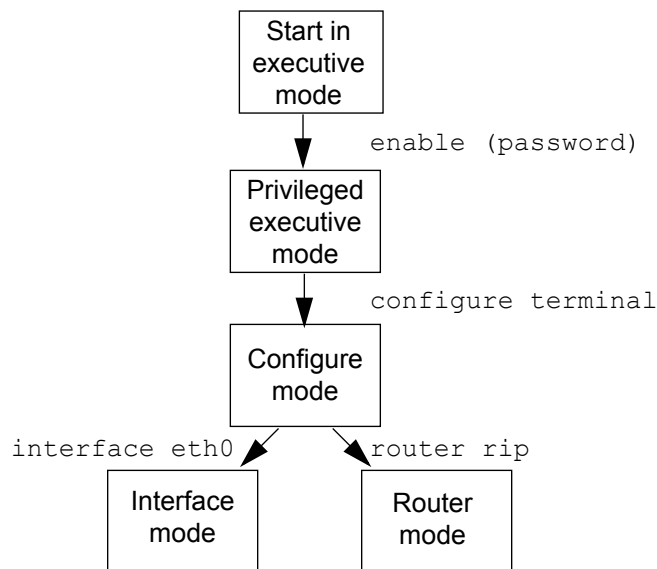
**Table 1-5: Common command modes**

Name	Description
Executive mode	Also called <i>view</i> mode, this is the first mode to appear after you start the CLI. It is a base mode from where you can perform basic commands such as <code>show</code> , <code>exit</code> , <code>quit</code> , <code>help</code> , <code>list</code> , and <code>enable</code> .
Privileged executive mode	Also called <i>enable</i> mode, in this mode you can run additional basic commands such as <code>debug</code> , <code>write</code> , and <code>show</code> .
Configure mode	Also called <i>configure terminal</i> mode, in this mode you can run configuration commands and go into other modes such as <code>interface</code> , <code>router</code> , <code>route map</code> , <code>key chain</code> , and <code>address family</code> .
Interface mode	In this mode you can configure protocol-specific settings for a particular interface. Any setting you configure in this mode overrides a setting configured in router mode.
Router mode	This mode is used to configure router-specific settings for a protocol such as RIP or OSPF.

---

## Command Mode Tree

The diagram below shows the common command mode hierarchy.



**Figure 1-1: Common command modes**

To change modes:

1. Enter privileged executive mode by entering `enable` in Executive mode.
2. Enter configure mode by entering `configure terminal` in Privileged Executive mode.

The example below shows starting `imish` and then moving from executive mode to privileged executive mode to configure mode and finally to router mode:

```
# ./imish
> enable mypassword
# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
(config)# router rip
(config-router)#
```

**Note:** Each protocol can have modes in addition to the common command modes. See the command reference for the respective protocol for details.

---

## Debug Command

Whether the settings you make for a `debug` command persist between sessions depends on the mode where you make the settings:

- When you make settings for a `debug` command in executive mode, the configuration is valid for the current session only and is not saved in the `ZebOS.conf` file.
- When you make settings for a `debug` command in configuration mode, the configuration is retained and saved in `ZebOS.conf` and used even after the session restarts.

## CHAPTER 2 Common Commands

---

This chapter provides a description, syntax, and examples of common Layer 2 commands.

- [flowcontrol](#) on page 24
- [hardware register get](#) on page 26
- [mirror](#) on page 28
- [show flowcontrol](#) on page 29
- [show mirror](#) on page 30
- [snmp restart mstp](#) on page 31

---

## flowcontrol

Use this command to enable or disable flow control.

Flow control enables connected Ethernet ports to control traffic rates during periods of congestion by allowing congested nodes to pause link operations at the other end. If one port experiences congestion and cannot receive any more traffic, it notifies the other port to stop sending until the condition clears. When a local device detects congestion at its end, it notifies the remote device by sending a pause frame. On receiving a pause frame, the remote device stops sending data packets, which prevents loss of data packets during the period of congestion.

Use the `no` parameter with this command to disable flow control.

### Command Syntax

```
flowcontrol both
flowcontrol send on
flowcontrol send off
flowcontrol receive on
flowcontrol receive off
flowcontrol wmpause <0-255> wmcancel <0-255>
no flowcontrol
```

### Parameters

<code>both</code>	Specify flow control mode for sending or receiving.
<code>send</code>	Specify flow control mode for sending.
<code>receive</code>	Specify the flow control mode for receiving.
<code>off</code>	Turn off flow control.
<code>on</code>	Turn on flow control.
<code>wmpause</code>	Specify the Watermark pause command.
<code>&lt;0-255&gt;</code>	Watermark pause value.
<code>wmcancel</code>	Specify the Watermark cancel command.
<code>&lt;0-255&gt;</code>	Watermark cancel value.

### Command Mode

Interface mode

### Examples

```
#configure terminal
(config)#interface eth1
(config-if)#flowcontrol receive off

#configure terminal
(config)#interface eth1
(config-if)#flowcontrol receive on

(config)#interface eth1
(config-if)#no flowcontrol
```



```
#configure terminal  
(config)#interface eth1  
(config-if)#flowcontrol wpause 75 wcancel 25
```

---

## hardware register get

Use this command to get the value of a chip register.

### Command Syntax

```
hardware register get ADDR
```

### Parameters

ADDR	Register address in 0xhhhh format
------	-----------------------------------

### Command Mode

Exec mode and Privileged Exec mode

### Example

```
#hardware register get 0x3000
```

---

## hardware register set

Use this command to set the value of a chip register.

### Command Syntax

```
hardware register set ADDR VALUE
```

### Parameters

ADDR	Register address in 0xhhhh format
VALUE	Value

### Command Mode

Exec mode and Privileged Exec mode

### Example

```
#hardware register set 0x3000 10
```

---

## mirror

Use this command to define a mirror source port and its direction. This command run must separately for each source port. In addition, users can only perform port mirroring on the same type of interfaces. That is, only a switchport interface can mirror a switchport interface.

If a user issues a switchport command on a port where mirroring is enabled on an interface, then port mirroring on that interface is removed. If users require port mirroring that interface, then they must explicitly configure port mirroring on that interface. Conversely, when a user enables port mirroring on a switchport interface and then issues a no switchport command, then port mirroring is removed from that interface. Thus, if users require port mirroring a switchport interface, then they need to enable an interface as switchport first and then enable port mirroring on that interface.

Use the `no` parameter with this command to disable port mirroring by the destination port on the specified source port.

### Command Syntax

```
mirror interface IFNAME direction both
mirror interface IFNAME direction receive
mirror interface IFNAME direction transmit
no mirror interface IFNAME
no mirror interface IFNAME direction receive
no mirror interface IFNAME direction transmit
```

### Parameters

<code>interface IFNAME</code>	Specify the name of the interface to be used.
<code>direction</code>	Specify a mirroring direction, including one of the following:
<code>both</code>	Specify a mirroring of traffic in both directions.
<code>receive</code>	Specify a mirroring of received traffic.
<code>transmit</code>	Specify a mirroring of transmitted traffic.

### Command Mode

Interface mode

### Examples

```
#configure terminal
(config)#interface eth0
(config-if)#mirror interface eth1 direction both

(config)#interface eth0
(config-if)#no mirror interface eth1 direction receive
```

---

## show flowcontrol

Use this command to display flow control information.

### Command Syntax

```
show flowcontrol
show flowcontrol interface IFNAME
```

### Parameters

```
interface IFNAME
```

Specify the name of the interface to be displayed.

### Command Mode

Exec mode and Privileged Exec mode

### Example

The following is a sample output of the `show flowcontrol interface` command displaying flow control information:

```
#show flowcontrol interface ge1
Port      Send FlowControl    Receive FlowControl RxPause TxPause
          admin    oper      admin    oper
-----
ge1       on      on      on      on      0      0
#
```

---

## show mirror

Use this command to display the status of all mirrored ports or those from a specified interface.

### Command Syntax

```
show mirror
show mirror interface IFNAME
```

### Parameters

```
interface IFNAME
```

Name of the source interface.

### Command Mode

Exec mode and Privileged Exec mode

### Examples

The following is a sample output of the `show mirror` command displaying the status of all mirrored ports:

```
#show mirror
Mirror Test Port Name: ge1
Mirror option: Enabled
Mirror direction: both
Monitored Port Name: ge2
Mirror Test Port Name: ge3
Mirror option: Enabled
Mirror direction: receive
Monitored Port Name: ge4
Mirror Test Port Name: ge3
Mirror option: Enabled
Mirror direction: receive
Monitored Port Name: ge1
Mirror Test Port Name: ge1
```

Following is a sample output of the `show mirror interface` command displaying mirroring information.

```
(config)#interface ge1
(config-if)#mirror interface ge2 direction both
(config-if)#end
#show mirror interface ge2
Mirror Test Port Name: ge1
Mirror option: Enabled
Mirror direction: both
Monitored Port Name: ge2
```

---

## snmp restart mstp

Use this command to restart SNMP in Multiple Spanning Tree Protocol (MSTP).

### Command Syntax

```
snmp restart mstp
```

### Parameters

None

### Command Mode

Configure mode

### Examples

```
#snmp restart mstp
```





## CHAPTER 3 Bridge Commands

---

This chapter provides a description, syntax, and examples of the bridge commands. It includes the following commands:

- [bridge acquire](#) on page 34
- [bridge address](#) on page 35
- [bridge ageing-time](#) on page 36
- [bridge forward-time](#) on page 37
- [bridge hello-time](#) on page 38
- [bridge mac-priority-override](#) on page 39
- [bridge max-age](#) on page 40
- [bridge max-hops](#) on page 41
- [bridge priority](#) on page 42
- [bridge shutdown](#) on page 43
- [bridge transmit-holdcount](#) on page 44
- [bridge-group](#) on page 45
- [bridge-group path-cost](#) on page 46
- [bridge-group priority](#) on page 47
- [clear mac address-table](#) on page 48
- [Static mac address table](#) on page 50
- [show bridge](#) on page 51
- [show interface switchport](#) on page 52
- [switchport](#) on page 53

---

## bridge acquire

Use this command to enable a bridge to learn station location information for an instance. This helps in making forwarding decisions.

Use the `no` parameter with this command to disable learning.

### Command Syntax

```
bridge <1-32> acquire
no bridge <1-32> acquire
```

### Parameter

<1-32>	Specify the bridge group ID.
--------	------------------------------

### Default

Learning is enabled by default for all instances.

### Command Mode

Configure mode

### Example

```
#configure terminal
(config)#bridge 3 acquire
```

---

## bridge address

Use this command to statically configure a bridge entry to forward or discard matching frames.

Use the `no` parameter with this command to disable this command.

### Command Syntax

```
bridge <1-32> address MAC discard IFNAME
bridge <1-32> address MAC discard IFNAME vlan <2-4094>
bridge <1-32> address MAC discard IFNAME vlan <2-4094> svlan <2-4094>
bridge <1-32> address MAC forward IFNAME
bridge <1-32> address MAC forward IFNAME vlan <2-4094>
bridge <1-32> address MAC forward IFNAME vlan <2-4094> svlan <2-4094>
no bridge <1-32> address MAC discard IFNAME
no bridge <1-32> address MAC discard IFNAME vlan <2-4094>
no bridge <1-32> address MAC discard IFNAME vlan <2-4094> svlan <2-4094>
no bridge <1-32> address MAC forward IFNAME
no bridge <1-32> address MAC forward IFNAME vlan <2-4094>
no bridge <1-32> address MAC forward IFNAME vlan <2-4094> svlan <2-4094>
```

### Parameters

<1-32>	Specify the bridge group ID.
MAC	A Media Access Control (MAC) address in the HHHH.HHHH.HHHH format.
forward	Configure the bridge to forward matching frames.
discard	Configure the bridge to discard matching frames.
IFNAME	Interface on which the frame are sent.
vlan	Identity of the VLAN in the range of <2-4094>.
svlan	Identity of the SVLAN in the range of <2-4094>.

### Command Mode

Configure mode

### Example

```
#configure terminal
(config)#bridge 2 address 2222.2222.2222 forward eth0
```

---

## bridge ageing-time

Use this command to specify the aging-out time for a learned MAC address. The learned MAC address persists until this specified time.

Use the `no` parameter with this command to disable this command.

### Command Syntax

```
bridge <1-32> ageing-time <10-1000000>
no bridge <1-32> ageing-time
```

### Parameters

<1-32>	Specify the bridge group ID.
<10-1000000>	Specify the aging time in seconds.

### Default

Default aging time is 300 seconds.

### Command Mode

Configure mode

### Example

```
#configure terminal
(config)#bridge 3 ageing-time 1000
```

---

## bridge forward-time

Use this command to set the time (in seconds) after which (if this bridge is the root bridge) each port changes states to learning and forwarding. This value is used by all instances.

Use the `no` parameter with this command to restore the default value of 15 seconds.

### Command Syntax

```
bridge <1-32> forward-time <4-30>
no bridge <1-32> forward-time
```

### Parameters

<1-32>	Specify the bridge group ID.
<4-30>	Specify the forwarding time delay in seconds.

Note: Care should be exercised if the value is to be made below 7 seconds.

### Default

The default value is 15 seconds.

### Command Mode

Configure mode

### Example

```
#configure terminal
(config)#bridge 3 forward-time 6
```

---

## bridge hello-time

Use this command to set the hello-time, the time in seconds after which (if this bridge is the root bridge) all the bridges in a bridged LAN exchange Bridge Protocol Data Units (BPDUs). A very low value of this parameter leads to excessive traffic on the network, while a higher value delays the detection of topology change. This value is used by all instances.

Configure the bridge instance name before using this command. The allowable range of values is 1-10 seconds. However, make sure that the value of hello time is always greater than the value of hold time (2 seconds by default).

Use the `no` parameter to restore the default value of the hello time.

Note: A Bridge shall enforce the following relationships for Hello-time, Max-age and Forward-delay.

- $2 \times (\text{Bridge\_Forward\_Delay} - 1.0 \text{ seconds}) \geq \text{Bridge\_Max\_Age}$
- $\text{Bridge\_Max\_Age} \geq 2 \times (\text{Bridge\_Hello\_Time} + 1.0 \text{ seconds})$

### Command Syntax

```
bridge <1-32> hello-time <1-10>
no bridge <1-32> hello-time
```

### Parameters

- |        |   |
|--------|---|
| <1-32> | Specify the bridge group ID.                |
| <1-10> | Specify the hello BPDU interval in seconds. |

### Default

Default value is 2 seconds.

### Command Mode

Configure mode

### Examples

```
#configure terminal
(config)#bridge 3 hello-time 3

(config)#no bridge 3 hello-time
```

## bridge mac-priority-override

Use this command to set a MAC priority override.

Use the `no` parameter with this command to unset a MAC priority override.

### Command Syntax

```
bridge <1-32> mac-priority-override mac-address MAC interface IFNAME vlan VLANID
    (static|static-priority-override|static-mgmt|static-mgmt-priority-override)
    priority <0-7>

no bridge <1-32> mac-priority-override mac-address MAC interface IFNAME vlan VLANID
```

### Parameters

<code>&lt;1-32&gt;</code>	Specify the bridge group ID.
<code>mac-address</code>	Enter a MAC address in HHHH.HHHH.HHHH format.
<code>interface</code>	Interface information
<code>vlan</code>	Add the values associated with a single VLAN
<code>static</code>	The MAC is a static entry
<code>static-mgmt</code>	The MAC is a Static Management
<code>static-mgmt-priority-override</code>	The MAC is a Static Management with priority override
<code>static-priority-override</code>	The MAC is a static with priority override
<code>priority</code>	priority <0-7> priority value

### Command Mode

Configuration Mode

### Examples

```
#configure terminal
(config)#bridge 1 mac-priority-override mac-address 1111.1111.1111 interface
eth1 vlan 2 static priority 2

(config)#no bridge 1 mac-priority-override mac-address 1111.1111.1111
interface eth1 vlan 2
```

---

## bridge max-age

Use this command to set the maximum age for a bridge. This value is used by all instances.

Maximum age is the maximum time in seconds for which (if a bridge is the root bridge) a message is considered valid. This prevents the frames from looping indefinitely. The value of maximum age should be greater than twice the value of hello time plus 1, but less than twice the value of forward delay minus 1. The allowable range for max-age is 6-40 seconds. Configure this value sufficiently high, so that a frame generated by root can be propagated to the leaf nodes without exceeding the maximum age.

Use the `no` parameter with this command to restore the default value of the maximum age.

Note: A Bridge shall enforce the following relationships for Hello-time, Max-age and Forward-delay.

- $2 \times (\text{Bridge\_Forward\_Delay} - 1.0 \text{ seconds}) \geq \text{Bridge\_Max\_Age}$
- $\text{Bridge\_Max\_Age} \geq 2 \times (\text{Bridge\_Hello\_Time} + 1.0 \text{ seconds})$

### Command Syntax

```
bridge <1-32> max-age <6-40>
no bridge <1-32> max-age
```

### Parameters

- |        |   |
|--------|---|
| <1-32> | Specify the bridge group ID.  |
| <6-40> | Specify the maximum time, in seconds, to listen for the root bridge <6-40>. |

### Default

The default value of bridge maximum age is 20 seconds.

### Command Mode

Configure Mode

### Examples

```
#configure terminal
(config)#bridge 2 max-age 12

(config)#no bridge 2 max-age
```



---

## bridge max-hops

Use this command to specify the maximum allowed hops for a BPDU in an MST region. This parameter is used by all the instances of the MST. Specifying the maximum hops for a BPDU prevents the messages from looping indefinitely in the network. When a bridge receives an MST BPDU that has exceeded the allowed maximum hops, it discards the BPDU.

Use the `no` parameter with this command to restore the default value.

### Command Syntax

```
bridge <1-32> max-hops <1-40>
no bridge <1-32> max-hops
```

### Parameters

<1-32>	Specify the bridge-group ID.
<1-40>	Specify the maximum hops for which the BPDU will be valid <1-40>.

### Default

The default maximum hops in an MST region are 20.

### Command Mode

Configure mode

### Examples

```
#configure terminal
(config)#bridge 3 max-hops 25

#configure terminal
(config)#no bridge 3 max-hops
```

---

## bridge priority

Use this command to set the bridge priority for the common instance. Using a lower priority indicates a greater likelihood of the bridge becoming root. The priority values can be set only in increments of 4096.

Use the `no` form of the command to reset it to the default value.

### Command Syntax

```
bridge (<1-32> | ) priority <0-61440>
no bridge (<1-32> | )priority
```

### Parameters

<1-32>	Specify the bridge group ID.
<0-61440>	Specify the bridge priority in the range of <0-61440>.

### Default

The default priority is 32768 (or hex 0x8000).

### Command Mode

Configure mode

### Examples

```
#configure terminal
(config)#bridge 2 priority 4096

(config)#no bridge 2 priority
```

---

## bridge shutdown

Use this command to disable a bridge.

Use the `no` parameter to reset the bridge.

### Command Syntax

```
bridge shutdown <1-32>
bridge shutdown <1-32> bridge-forward
no bridge shutdown <1-32>
```

### Parameters

<1-32>	Specify the bridge group ID.
bridge-forward	Put all ports of the bridge into forwarding state

### Command Mode

Configure mode

### Example

```
#configure terminal
(config)#bridge shutdown 4
```

---

## bridge transmit-holdcount

Use this command to set the maximum number of transmissions of BPDUs by the transmit state machine.

Use the `no` parameter with this command to restore the default transmit hold-count value.

### Command Syntax

```
bridge <1-32> transmit-holdcount <1-10>
no bridge <1-32> transmit-holdcount
```

### Parameters

<1-32>	Specify the bridge group ID.
<1-10>	Transmit hold-count value.

### Default

Transmit hold-count default value is six (6).

### Command Mode

Configure mode

### Examples

```
#configure terminal
(config)#bridge 1 transmit-holdcount 5

(config)#no bridge 1 transmit-holdcount
```

---

## bridge-group

Use this command to bind an interface with a bridge specified by the parameter.

Use the `no` parameter with this command to disable this command.

### Command Syntax

```
bridge-group (<1-32>)  
no bridge-group (<1-32>)
```

### Parameters

`<1-32>` Specify the bridge group ID.

### Command Mode

Interface mode

### Examples

```
#configure terminal  
(config)#interface eth1  
(config-if)#bridge-group 2  
  
(config)#interface eth1  
(config-if)#no bridge-group 2
```

---

## bridge-group path-cost

Use this command to set the cost of a path associated with a bridge group. The lower the path cost, the greater the likelihood of the bridge becoming root.

Use the `no` parameter with this command to restore the default priority value.

### Command Syntax

```
bridge-group <1-32> path-cost <1-200000000>
no bridge-group <1-32> path-cost
```

### Parameters

<code>&lt;1-32&gt;</code>	Specify the bridge group ID.
<code>path-cost</code>	Specify the path-cost of a port.
<code>&lt;1-200000000&gt;</code>	Specify the cost to be assigned to the group.

### Command Mode

Interface mode

### Example

```
#configure terminal
(config)#interface eth1
(config-if)#bridge-group 3 path-cost 123

(config-if)#no bridge-group 3 path-cost
```

---

## bridge-group priority

Use this command to set the port priority for a bridge. A lower priority indicates a greater likelihood of the bridge becoming root.

### Command Syntax

```
bridge-group <1-32> priority <0-240>
no bridge-group <1-32> priority
```

### Parameters

<1-32>	Specify the bridge group ID.
<0-240>	Specify the port priority range (a lower priority indicates greater likelihood of the interface becoming a root). The priority values can only be set in increments of 16.

### Default

The default priority is 1.

### Command Mode

Interface mode

### Example

```
#configure terminal
(config)#interface eth1
(config-if)#bridge-group 4 priority 96

(config)#interface eth1
(config-if)#no bridge-group 4 priority
```

---

## clear mac address-table

Use this command to clear the filtering database for the default bridge. This command can be issued to do the following:

- clear the filtering database
- clear all filtering database entries configured through CLI (static)
- clear all multicast filtering database entries
- clear all multicast filtering database entries for a given VLAN or interface
- clear all static or multicast database entries based on a mac address

### Command Syntax

```
clear mac address-table dynamic
clear mac address-table dynamic bridge <1-32>
clear mac address-table dynamic (address MACADDR | interface IFNAME (instance
INST|) | vlan VID)
clear mac address-table dynamic (address MACADDR | interface IFNAME (instance
INST|) | vlan VID) bridge <1-32>
clear mac address-table (dynamic|static|multicast) cvlan VID
clear mac address-table (dynamic|static|multicast) cvlan VID svlan VID
clear mac address-table (dynamic|static|multicast) cvlan VID svlan VID bridge <1-
32>
clear mac address-table (static|multicast)
clear mac address-table (static|multicast) bridge <1-32>
clear mac address-table (static|multicast) (address MACADDR | interface IFNAME |
vlan VID)
clear mac address-table (static|multicast) (address MACADDR | interface IFNAME |
vlan VID) bridge <1-32>
```

### Parameters

dynamic	Clears all dynamic entries.
multicast	Clears all multicast filtering database entries.
static	Clears all entries configured through management.
address	Clear the specified MAC Address.
MACADDR	When filtering database, entries are cleared based on the MAC address.
bridge	Clears the bridge group ID. Value range is 1-32.
bridge	Clears the bridge group ID. Value range is 1-32.
cvlan	Clears all MAC address for the specified CVLAN. Value range is 1-4094.
svlan	Clears all mac address for the specified SVLAN. Value range is 1-4094.
interface	Clears all MAC address for the specified interface.
bridge	Clears the bridge group ID. Value range is 1-32.
instance	Clears MSTP instance ID. Value range is <1-63>.



---

vlan	Clears all MAC address for the specified VLAN. Value range is 1-4094.
bridge	Clears the bridge group ID. Value range is 1-32.

## Command Mode

Privileged Exec mode

## Examples

This example shows how to clear all filtering database entries configured through the CLI:

```
#clear mac address-table static
```

This example shows how to clear multicast filtering database entries:

```
#clear mac address-table multicast
```

This example shows how to clear all filtering database entries for a given interface:

```
#clear mac address-table static interface eth0
```

This example shows how to clear multicast filtering database entries for a given VLAN:

```
#clear mac address-table multicast vlan 2
```

This example shows how to clear static filtering database entries for a given MAC address:

```
#clear mac address-table static address 0202.0202.0202
```

This example shows how to clear all filtering database entries configured through CLI:

```
#clear mac address-table static bridge 1
```

This example shows how to clear multicast filtering database entries:

```
#clear mac address-table multicast bridge 1
```

This example shows how to clear all filtering database entries for a given interface:

```
#clear mac address-table static interface eth0 bridge 1
```

This example shows how to clear multicast filtering database entries for a given VLAN.

```
#clear mac address-table multicast vlan 2 bridge 1
```

This example shows how to clear static filtering database entries for a given MAC address:

```
#clear mac address-table static address 0202.0202.0202 bridge 1
```

This example shows how to clear all filtering database entries learned through bridge operation for a given MAC address.

```
#clear mac address-table dynamic address 0202.0202.0202
```

This example shows how to clear all filtering database entries learned through bridge operation for a given MAC address.

```
#clear mac address-table dynamic address 0202.0202.0202 bridge 1
```

---

## Static mac address table

Use this command to configure the static forwarding table entry for the bridge.

Use the no parameter with this command to remove the entry for the bridge

### Command Syntax

```
bridge <1-32> address XXXX.XXXX.XXXX (forward|discard) IFNAME
bridge <1-32> address XXXX.XXXX.XXXX (forward|discard) IFNAME vlan <2-4094>
bridge <1-32> address XXXX.XXXX.XXXX (forward|discard) IFNAME vlan <2-4094> svlan
<2-4094>
no bridge <1-32> address XXXX.XXXX.XXXX (forward|discard) IFNAME
no bridge <1-32> address XXXX.XXXX.XXXX (forward|discard) IFNAME vlan <2-4094>
no bridge <1-32> address XXXX.XXXX.XXXX (forward|discard) IFNAME vlan <2-4094>
svlan <2-4094>
```

### Parameters

<1-32>	Specify the bridge group ID
XXXX.XXXX.XXXX	A Media Access Control (MAC) address in the HHHH.HHHH.HHHH format.
forward	Configure the bridge to forward matching frames.
discard	Configure the bridge to discard matching frames.
IFNAME	Interface on which the frame comes out.
vlan	Identity of the VLAN in the range of <2-4094>.
svlan	Identity of the SVLAN in the range of <2-4094>.

### Command Mode

Configure mode

### Example

```
#configure terminal
(config)#bridge 1 address 0000.000a.0021 forward eth0
(config)#no bridge 1 address 0000.000a.0021 forward eth0
```

---

## show bridge

Use this command to display basic configuration information for a bridge.

### Command Syntax

```
show bridge
```

### Parameters

None

### Command Mode

Exec mode and Privileged Exec mode

### Example

The following is a sample of the output for the `show bridge` command for a bridge with a minimum configuration.

```
#show bridge
bridge      CVLAN  SVLAN  BVLAN  port      mac              fwd  timeout
2           1                eth2     0002.b328.5255 1      0
1           1                eth1     0002.b328.5254 1      0
```

---

## show interface switchport

Use this command to display the characteristics of the interface with the current VLAN.

### Command Syntax

```
show interface switchport bridge <1-32>
```

### Parameter

bridge	Displays the bridge group name used for bridging.
--------	---

### Command Mode

Exec mode and Privileged Exec mode

### Example

The following is an output of this command displaying the characteristics of this interface on bridge 2.

```
#show interface switchport bridge 2
Interface name      : eth5
Switchport mode    : access
Ingress filter     : disable
Acceptable frame types : all
Vid swap           : disable
Default vlan       : 2
Configured vlans   : 2
Interface name      : eth4
Switchport mode    : access
Ingress filter     : disable
Acceptable frame types : all
Vid swap           : disable
Default vlan       : 1
Configured vlans   : 1
```

### Example

```
#show interface switchport bridge 4
```

---

## switchport

Use this command to set the mode of the ZebOS-XP Hybrid Switch Router feature to switched only.

All interfaces are configured routed by default. To change the behavior of an interface from switched to routed, you must explicitly give the `no switchport` command.

Use the `no` parameter with this command to set the mode to routed.

### Command Syntax

```
switchport
no switchport
```

### Parameters

None

### Command Mode

Interface mode

### Examples

```
#configure terminal
(config)#interface eth0
(config-if)#switchport

(config)#interface eth0
(config-if)#no switchport
```



## CHAPTER 4    Spanning Tree Protocol Commands

---

This chapter provides a description, syntax, and examples of the Spanning Tree Protocol (STP), Rapid Spanning Tree Protocol (RSTP) and Multiple Spanning Tree Protocol (MSTP) commands. It includes the following commands:

- [bridge cisco-interoperability](#) on page 57
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- [bridge instance priority](#) on page 59
- [bridge instance vlan](#) on page 60
- [bridge multiple-spanning-tree](#) on page 61
- [bridge protocol ieee](#) on page 62
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- [bridge spanning-tree pathcost](#) on page 71
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- [spanning-tree te-msti configuration](#) on page 125
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- [user-priority-regen-table](#) on page 130



---

## bridge cisco-interoperability

Use this command to enable/disable Cisco interoperability for MSTP (Multiple Spanning Tree Protocol).

If Cisco interoperability is required, all ZebOS-XP devices in the switched LAN must be Cisco-interoperability enabled. When ZebOS-XP interoperates with Cisco, the only criteria used to classify a region are the region name and revision level. VLAN-to-instance mapping is not used to classify regions when interoperating with Cisco.

### Command Syntax

```
bridge <1-32> cisco-interoperability (enable | disable)
```

### Parameters

<1-32>	Specify the bridge group ID
enable	Enable Cisco interoperability for MSTP bridge
disable	Disable Cisco interoperability for MSTP bridge

### Default

Cisco interoperability is disabled.

### Command Mode

Configure mode

### Examples

To enable Cisco interoperability on a switch for a bridge:

```
#configure terminal
(config)#bridge 2 cisco-interoperability enable
```

To disable Cisco interoperability on a switch for a particular bridge:

```
#configure terminal
(config)#bridge 2 cisco-interoperability disable
```

---

## bridge instance

Use this command to add an MST instance to a bridge.

Use the `no` form of this command to delete an MST instance identifier from a bridge.

### Command Syntax

```
bridge (<1-32> | backbone) instance (<1-63> | spbm | spbv)
no bridge (<1-32> | backbone) instance (<1-63> | spbm | spbv)
```

### Parameters

<1-32>	Bridge identifier.
backbone	Backbone bridge.
<1-63>	MST instance identifier.
spbm	Shortest Path Bridging - MAC instance.
spbv	Shortest Path Bridging - VID instance.

### Command Mode

MST configure mode

### Examples

```
#configure terminal
(config)#bridge 4 protocol mstp
(config)#spanning-tree mst configuration
(config-mst)#bridge 4 instance 3
...
(config-mst)#no bridge 4 instance 3
```

---

## bridge instance priority

Use this command to set the bridge instance priority.

Use the `no` form of this command to reset the priority to its default.

### Command Syntax

```
bridge (<1-32> | backbone) instance <1-63> priority <0-61440>
no bridge (<1-32> | backbone) instance <1-63> priority
```

### Parameters

<code>&lt;1-32&gt;</code>	Specify the bridge identifier.
<code>backbone</code>	Specifies the backbone bridge.
<code>&lt;1-63&gt;</code>	Specify the instance identifier.
<code>priority</code>	Specify the bridge priority for the instance. The lower the priority of the bridge, the better the chances is of the bridge becoming a root bridge or a designated bridge for the LAN. The priority values can be set only in increments of 4096. The default value is 32768.
<code>&lt;0-61440&gt;</code>	Specify the bridge priority.

### Command Mode

Configure mode

### Examples

```
(config)#bridge 4 instance 3 priority 1
```

---

## bridge instance vlan

Use this command to simultaneously add multiple VLANs for the corresponding instance of a bridge. The VLANs must be created before being associated with an MST instance (MSTI). If the VLAN range is not specified, the MSTI will not be created.

Use the `no` form of this command to simultaneously remove multiple VLANs for the corresponding instance of a bridge.

### Command Syntax

```
bridge (<1-32> | backbone) instance (<1-63> | spbm | spbv) vlan VLANID
no bridge (<1-32> | backbone) instance (<1-63> | spbm | spbv) vlan VLANID
```

### Parameters

<1-32>	Bridge identifier.
backbone	Backbone bridge.
<1-63>	MST instance identifier.
spbm	Shortest Path Bridging - MAC instance.
spbv	Shortest Path Bridging - VID instance.
VLANID	VLAN identifier(s) <2-4094>. You can specify a single VLAN, a VLAN range, or a VLAN list.  For a VLAN range, specify two VLAN identifiers: the lowest and then the highest separated by a hyphen. For a VLAN list, specify the VLAN identifiers separated by commas. Do not enter spaces between the hyphens or commas.

### Command Mode

MST configure mode

### Examples

To associate multiple VLANs, in this case VLANs 10 and 20 to instance 1 of bridge 1:

```
#configure terminal
(config)#bridge 1 protocol mstp
(config)#spanning-tree mst configuration
(config-mst)#bridge 1 instance 1 vlan 10,20
```

To associate multiple VLANs, in this case, VLANs 10, 11, 12, 13, 14, and 15 to instance 1 of bridge 1:

```
#configure terminal
(config)#bridge 1 protocol mstp
(config)#spanning-tree mst configuration
(config-mst)#bridge 1 instance 1 vlan 10-15
```

To delete multiple VLANs, in this case, VLANs 10 and 11 from instance 1 of bridge 1:

```
#configure terminal
(config)#bridge 1 protocol mstp
(config)#spanning-tree mst configuration
(config-mst)#no bridge 1 instance 1 vlan 10,11
```

---

## bridge multiple-spanning-tree

Use this command to enable MSTP on a bridge.

Use the `no` form of this command to disable MSTP on the bridge.

### Command Syntax

```
bridge <1-32> multiple-spanning-tree enable
no bridge <1-32> multiple-spanning-tree enable (bridge-forward|)
```

### Parameters

<code>&lt;1-32&gt;</code>	Specify the bridge-group ID.
<code>enable</code>	Enables the spanning tree protocol.
<code>bridge-forward</code>	Puts all ports of the specified bridge into forwarding state.

### Default

If the `bridge-forward` option is entered when using the `no` parameter, the default behavior is to put all bridge ports in blocking state.

### Command Mode

Configure mode

### Examples

```
#configure terminal
(config)#bridge 2 multiple-spanning-tree enable

#configure terminal
(config)#no bridge 2 multiple-spanning-tree enable bridge-forward
```

---

## bridge protocol ieee

Use this command to add a IEEE 802.1d Spanning Tree Protocol bridge.

After creating a bridge instance, add interfaces to the bridge using the `bridge-group` command. Bring the bridge instance into operation with the `no shutdown` command in interface mode.

Use the `no` parameter with this command to remove the bridge.

### Command Syntax

```
bridge <1-32> protocol ieee (vlan-bridge|)
no bridge <1-32> protocol ieee
```

### Parameters

<code>&lt;1-32&gt;</code>	Specify the bridge group ID.
<code>vlan-bridge</code>	Specify this as a VLAN-aware bridge.

### Command Mode

Configure mode

### Example

```
#configure terminal
(config)#bridge 3 protocol ieee

(config)#bridge 4 protocol ieee vlan-bridge
```

---

## bridge protocol mstp

Use this command to create a multiple spanning-tree protocol (MSTP) bridge of a specified parameter. This command creates an instance of the spanning tree and associates the VLANs specified with that instance.

The MSTP bridges can have different spanning-tree topologies for different VLANs inside a region of “similar” MSTP bridges. The multiple spanning tree protocol, like the rapid spanning tree protocol, provides rapid reconfiguration capability, while providing load balancing ability. A bridge created with this command forms its own separate region unless it is added explicitly to a region using the `region name` command.

Use the `no` parameter with this command to remove the bridge.

### Command Syntax

```
bridge <1-32> protocol mstp (ring|)
no bridge <1-32>
```

### Parameters

<1-32>	Specify the bridge group ID.
ring	(Optional) Enable rapid ring spanning-tree.

### Command Mode

Configure mode

### Examples

```
#configure terminal
(config)#bridge 2 protocol mstp

#configure terminal
(config)#bridge 2 protocol mstp ring
```

---

## bridge protocol rstp

Use this command to add an IEEE 802.1w Rapid Spanning Tree Protocol (RSTP) bridge.

After creating a bridge instance, add interfaces to the bridge using the `bridge-group` command. Bring the bridge instance into operation with the `no shutdown` command in Interface mode.

Use the `no` parameter with this command to remove the bridge.

### Command Syntax

```
bridge <1-32> protocol rstp (ring|)
bridge <1-32> protocol rstp (vlan-bridge|) (ring|)
no bridge <1-32>
```

### Parameters

<code>&lt;1-32&gt;</code>	Specify the bridge group ID.
<code>ring</code>	(Optional) Add an RSTP bridge for a ring topology.
<code>vlan-bridge</code>	(Optional) Adds a VLAN-aware bridge.

### Command Mode

Configure mode

### Examples

```
#configure terminal
(config)#bridge 2 protocol rstp

#configure terminal
(config)#bridge 3 protocol rstp vlan-bridge
```



---

## bridge rapid-spanning-tree

Use this command to enable or disable RSTP on a specific bridge. Use the `bridge-forward` option with the `no` form of the command to place all ports on the specified bridge into the forwarding state.

Use the `no` form of the command to disable the Rapid Spanning Tree protocol on a bridge.

### Command Syntax

```
bridge (<1-32>|backbone) rapid-spanning-tree enable
no bridge <1-32> rapid-spanning-tree enable (bridge-forward|)
```

### Parameters

<code>&lt;1-32&gt;</code>	Specify the bridge group ID.
<code>enable</code>	Enables the spanning tree protocol.
<code>bridge-forward</code>	(Optional) Puts all ports of the specified bridge into forwarding state.

### Default

When the `bridge-forward` option is used with the `no` parameter, the default behavior puts all bridge ports in the blocking state.

### Command Mode

Configure mode

### Examples

```
configure terminal
(config)#bridge 2 rapid-spanning-tree enable

configure terminal
(config)#no bridge 2 rapid-spanning-tree enable bridge-forward
```

---

## bridge region

Use this command to create an MST region and specify its name. MST bridges of a region form different spanning trees for different VLANs.

Use the `no` form of the command to disable the Rapid Spanning Tree protocol on a region.

### Command Syntax

```
bridge <1-32> region REGION_NAME
no bridge <1-32> region
```

### Parameters

<1-32>	Specify the bridge group ID.
REGION_NAME	Specify the name of the region.

### Default

By default, each MST bridge starts with the region name as its bridge address. This means each MST bridge is a region by itself, unless specifically added to one.

### Command Mode

MST configure mode

### Examples

```
#configure terminal
(config)#spanning-tree mst configuration
(config-mst)#bridge 3 region IPI

(config)#spanning-tree mst configuration
(config-mst)#no bridge 3 region
```

---

## bridge revision

Use this command to specify the number for configuration information.

### Command Syntax

```
bridge <1-32> revision <0-65535>
no bridge <1-32>
```

### Parameters

<1-32>	Specify the bridge group ID in the range of <1-32>.
<0-65535>	Specify a revision number in the range of <0-65535>.

### Default

The default value of revision number is 0.

### Command Mode

MST configure mode

### Example

```
#configure terminal
(config)#spanning-tree mst configuration
(config-mst)#bridge 3 revision 25
```

---

## bridge spanning-tree

Use this command to enable the Spanning Tree Protocol on a bridge.

Use the `no` parameter to disable the Spanning Tree Protocol on the bridge.

### Command Syntax

```
bridge <1-32> spanning-tree enable
no bridge <1-32> spanning-tree enable (bridge-forward|)
```

### Parameters

<code>&lt;1-32&gt;</code>	Specify the bridge group ID.
<code>enable</code>	Enables the spanning tree protocol on this bridge.
<code>bridge-forward</code>	Puts all ports of the specified bridge into the forwarding state.

### Default

If the `bridge-forward` option is entered when using the `no` parameter, the default behavior is to put all bridge ports in blocking state.

### Command Mode

Configure mode

### Examples

```
#configure terminal
(config)#bridge 2 spanning-tree enable

#configure terminal
(config)#no bridge 2 spanning-tree enable bridge-forward
```

---

## bridge spanning-tree errdisable-timeout

Use this command to enable the error-disable-timeout facility, which sets a timeout for ports that are disabled due to the BPDU guard feature.

The BPDU guard feature shuts down the port on receiving a BPDU on a BPDU-guard enabled port. This command associates a timer with the feature such that the port gets enabled back without manual intervention after a set interval.

Use the `no` parameter to disable the error-disable-timeout facility.

### Command Syntax

```
bridge <1-32> spanning-tree errdisable-timeout enable
bridge <1-32> spanning-tree errdisable-timeout interval <10-1000000>
no bridge <1-32> spanning-tree errdisable-timeout enable
no bridge <1-32> spanning-tree errdisable-timeout interval
```

### Parameters

<1-32>	Specify the bridge group ID.
enable	Enable the timeout mechanism for the port to be enabled back
interval	Specify the interval after which port shall be enabled.
<10-1000000>	Specify the error-disable-timeout interval in seconds.

### Default

By default, the port is enabled after 300 seconds.

### Command Mode

Configure mode

### Examples

```
#configure terminal
(config)#bridge 1 spanning-tree errdisable-timeout enable

#configure terminal
(config)#bridge 4 spanning-tree errdisable-timeout interval 34
```

---

## bridge spanning-tree force-version

Use this command to set the version for the bridge. A version identifier of less than a value of 2 enforces the spanning tree protocol. Although the command supports an input range of 0-4, for RSTP, the valid range is 0-2. When the force-version is set for a bridge, all ports of the bridge have the same spanning tree version set.

Use the `show spanning tree` command to display administratively configured and currently running values of the BPDU filter parameter for the bridge and port (see [show spanning-tree](#) on page 98).

Use the `no` parameter with this command to disable the version for the bridge.

### Command Syntax

```
bridge <1-32> spanning-tree force-version <0-4>
no bridge <1-32> spanning-tree force-version
```

### Parameters

<1-32>	Specify the bridge group ID.
force-version	Specify a force version identifier:
0	STP
1	Not supported
2	RSTP
3	MSTP
4	SPB

### Default

The default value of the version is 0.

### Command Mode

Configure mode

### Examples

Set the value to enforce the spanning tree protocol:

```
#configure terminal
(config)#bridge 1 spanning-tree force-version 0

(config)#no bridge 1 spanning-tree force-version
```

---

## bridge spanning-tree pathcost

Use this command to set a spanning-tree path cost method.

If the short parameter is used, the switch uses a value for the default path cost a number in the range 1 through 65,535. If the long parameter is used, the switch uses a value for the default path cost a number in the range 1 through 200,000,000. Refer to the [show spanning-tree](#) on page 98 to view the administratively configured and current running pathcost method running on a bridge.

Use the no option with this command to return the path cost method to the default setting.

### Command Syntax

```
bridge <1-32> spanning-tree pathcost method (short|long)
no bridge <1-32> spanning-tree pathcost method
```

### Parameters

<1-32>	Specify the bridge group ID.
method	Method used to calculate default port path cost.
long	Use 16-bit based values for default port path costs.
short	Use 32-bit based values for default port path costs.

### Default

The default path cost method for STP is short and for MSTP/RSTP is long.

### Command Mode

Configure mode

### Examples

```
#configure terminal
(config)#bridge 1 spanning-tree pathcost method short

(config)#no bridge 1 spanning-tree pathcost method
```

---

## bridge spanning-tree portfast

Use this command to set the portfast BPDU (Bridge Protocol Data Unit) guard or filter for the bridge.

Use the `show spanning tree` command to display administratively configured and currently running values of the BPDU filter parameter for the bridge and port (see [show spanning-tree](#) on page 98).

Use the `no` parameter with this command to disable the BPDU filter for the bridge.

### BPDU Filter

All ports that have their BPDU filter set to default take the same value of BPDU filter as that of the bridge. The Spanning Tree Protocol sends BPDUs from all ports. Enabling the BPDU Filter feature ensures that PortFast-enabled ports do not transmit or receive any BPDUs.

### BPDU Guard

When the BPDU guard feature is set for a bridge, all portfast-enabled ports of the bridge that have the BPDU guard set to default shut down the port on receiving a BPDU. In this case, the BPDU is not processed. You can either bring the port back up manually by using the `no shutdown` command, or configure the `errdisable-timeout` feature to enable the port after the specified time interval.

### Command Syntax

```
bridge <1-32> spanning-tree portfast bpdu-guard
bridge <1-32> spanning-tree portfast bpdu-filter
no bridge <1-32> spanning-tree portfast bpdu-guard
no bridge <1-32> spanning-tree portfast bpdu-filter
```

### Parameters

<1-32>	Specify the bridge group ID.
bpdu-filter	Specify to filter the BPDUs on portfast enabled ports.
bpdu-guard	Specify to guard the portfast ports against BPDU receive.

### Command Mode

Configure mode

### Example

```
#configure terminal
(config)#bridge 3 spanning-tree portfast bpdu-filter

#configure terminal
(config)#bridge 1 spanning-tree portfast bpdu-guard
```



---

## bridge te-msti

Use this command to enable or disable a Multiple Spanning Tree Instance (MSTI). When an MSTI is shutdown (disabled) each VLAN in the MSTI is set to the forwarding state on all bridge ports which the VLAN as a member of. When an MSTI is enabled (no shutdown), normal MSTP operation is started for the MSTI.

The `te-msti` always refers to the MST instance indexed by the pre-defined macro constant `MSTP_TE_MSTID` internally. This is the only MST instance which supports the disabling of spanning trees. All VLANs that do not want spanning tree topology computation need to be assigned to this `te-msti` instance.

This command is intended for supporting Traffic Engineering (TE) Ethernet tunnels. All VLANs allocated for traffic engineering should be assigned to one MSTI. That MSTI can in turn shutdown the spanning tree operation so that each VLAN path through the network can be manually provisioned.

Use the `no` form of this command to remove the configuration.

### Command Syntax

```
bridge (<1-32> | backbone) te-msti
bridge (<1-32> | backbone) te-msti vlan <1-4094>
no bridge (<1-32> | backbone) te-msti
no bridge (<1-32> | backbone) te-msti vlan <1-4094>
```

### Parameters

<code>&lt;1-32&gt;</code>	Specify the bridge group ID.
<code>backbone</code>	Identity of the backbone bridge group.
<code>vlan</code>	Specify a VLAN.
<code>&lt;1-4094&gt;</code>	Specify a VLAN identifier to be associated.

Note: This designated instance is defined in 802.1Qay clause 8.9 to be 0xFFE.

### Command Mode

TE-MSTI Configure mode

### Examples

```
#configure terminal
(config)#spanning-tree te-msti configuration
(config-te-msti)#bridge 2 te-msti vlan 10
(config-te-msti)#no bridge 2 te-msti vlan 10
```

---

## bridge vlan

Use this command to set the priority value for the spanning-tree on the bridge. The lower the priority of the VLAN on a bridge, the better the chances of the bridge becoming a root bridge, or a designated bridge for the VLAN. The permitted range of values is 0-61440. Priority values can only be set in increments of 4096.

Use the `no` form of this command to restore the default value of the bridge priority.

### Command Syntax

```
bridge <1-32> vlan <2-4094> priority <0-61440>
no bridge <1-32> vlan <2-4094> priority
```

### Parameters

<code>&lt;1-32&gt;</code>	Specify the bridge group ID.
<code>vlan</code>	Identity of the VLAN in the range of <code>&lt;2-4094&gt;</code> .
<code>priority</code>	Specify the bridge priority for the common instance.
<code>&lt;0-61440&gt;</code>	Set the bridge priority in increments of 4096 (Lower priority indicates greater likelihood of becoming root).

### Default

The default value of `PRIORITY` for each VLAN is 32768.

### Command Mode

Configure mode

### Examples

```
#configure terminal
(config)#bridge 1 vlan 2 priority 80
(config)#no bridge 1 vlan 10 priority
```

---

## bridge-group instance

Use this command to assign a Multiple Spanning Tree (MST) instance to a port.

Use the `no` form of this command to remove the interface from the MST instance.

### Command Syntax

```
bridge-group (<1-32> | backbone) instance (<1-63> | spbm | te-msti)
no bridge-group (<1-32> | backbone) instance (<1-63> | spbm | te-msti)
```

### Parameters

<code>&lt;1-32&gt;</code>	Bridge identifier.
<code>backbone</code>	Backbone bridge.
<code>&lt;1-63&gt;</code>	Multiple spanning tree instance identifier.
<code>spbm</code>	Shortest Path Bridging - MAC instance.
<code>te-msti</code>	Traffic engineering MSTI instance.
For Provider Backbone Bridging (PBB), bridge-group <1-32> refers to the I-component or PB bridge while the <backbone> bridge group refers to the B-component. Usually for a BEB (Backbone Edge Bridge) device, the backbone bridge-group is used for traffic engineering.	
For a PB (Provider Bridge) device used as BCB (Backbone Core Bridge), bridge group <1-32> is used for traffic engineering.	

### Command Mode

Interface mode

### Examples

```
#configure terminal
(config)#interface eth0
(config-if)#bridge-group 1
(config-if)#bridge-group 1 instance te-msti
```

---

## bridge-group instance path-cost

Use this command to set a path cost for a multiple spanning tree instance.

Before you can give this command, you must explicitly add an MST instance to a port using the `bridge-group instance` command.

Use the `no` form of this command to set the path cost to its default which varies depending on bandwidth.

### Command Syntax

```
bridge-group (<1-32> | backbone) instance <1-63> path-cost <1-200000000>
no bridge-group ( <1-32> | backbone) instance <1-63> path-cost
```

### Parameters

<1-32>	Bridge identifier.
backbone	Specify the backbone bridge.
<1-63>	Set the MST instance identifier.
<1-200000000>	Path cost for a port (a lower path cost means greater likelihood of becoming root).

### Default

Assuming a 10 Mb/s link speed, the default value is 200,000.

### Command Mode

Interface mode

### Example

```
#configure terminal
(config)#spanning-tree mst configuration
(config-mst)#bridge 4 instance 3 vlan 3
(config-mst)#exit
(config)#interface eth1
(config-if)#bridge-group 4 instance 3
(config-if)#bridge-group 4 instance 3 path-cost 1000
```

---

## bridge-group instance priority

Use this command to set the priority of a multiple spanning tree instance.

The Multiple Spanning Tree Protocol uses port priority as a tiebreaker to determine which port should forward frames for a particular instance on a LAN, or which port should be the root port for an instance. A lower value implies a better priority. In the case of the same priority, the interface index will serve as the tiebreaker, with the lower-numbered interface being preferred over others.

### Command Syntax

```
bridge-group (<1-32>) instance (<1-63>) priority <0-240>
```

### Parameters

<1-32>	Bridge identifier.
backbone	Backbone bridge.
<1-63>	Multiple spanning tree instance identifier.
<0-240>	Port priority. A lower value means greater likelihood of becoming root. Set the port priority in increments of 16.

### Default

The default value of the port priority is 128.

### Command Mode

Interface mode

### Example

```
(config)#interface eth2
(config-if)#bridge-group 2
(config-if)#bridge-group 2 instance 4
(config-if)#bridge-group 2 instance 4 priority 64
```

---

## bridge-group path-cost

Use this command to set the cost of a path. Before you can use this command to set a path-cost in a VLAN configuration, you must explicitly add an MST instance to a port using the `bridge-group instance` command.

Use the `no` parameter with this command to restore the default cost value of the path which varies depending on the bandwidth.

### Command Syntax

```
bridge-group <1-32> path-cost <1-200000000>
no bridge-group <1-32> path-cost
```

### Parameters

<1-32>	Specify the bridge group ID.
path-cost	Specify the cost of path for a port.
<1-200000000>	
	Specify the cost of the path (a lower cost means a greater likelihood of the interface becoming root).

### Default

Assuming a 10 Mb/s link speed, the default value is 200,000.

### Command Mode

Interface mode

### Examples

```
#configure terminal
(config)#spanning-tree mst configuration
(config-mst)#bridge 4 instance 3 vlan 3
(config-mst)#exit
(config)#interface eth1
(config-if)#bridge-group 4
(config-if)#bridge-group 4 path-cost 1000
```

---

## bridge-group priority

Use this command to set the port priority for a bridge group.

The Multiple Spanning Tree Protocol uses port priority as a tiebreaker to determine which port should forward frames for a particular instance on a LAN, or which port should be the root port for an instance. A lower value implies a better priority. In the case of the same priority, the interface index will serve as the tiebreaker, with the lower-numbered interface being preferred over others.

### Command Syntax

```
bridge-group (<1-32> | backbone) priority <0-240>
```

### Parameters

<1-32>	Specify the bridge group ID.
backbone	Backbone bridge.
<0-240>	Specify the port priority (a lower priority indicates greater likelihood of the interface becoming a root). The priority values can only be set in increments of 16.

### Default

The default value of the port priority for each instance is 128.

### Command Mode

Interface mode

### Example

```
#configure terminal
(config)#interface eth0
(config-if)#bridge-group 4 priority 80
```

---

## bridge-group spanning-tree

This command is used to enable or disable the spanning-tree on a configured bridge. If a bridge is already configured with <1-32, and “spanning-tree disable|enable” command is executed an error s returned, because there is no default-bridge.

### Command Syntax

```
bridge-group <1-32> spanning-tree (disable|enable)
```

### Parameters

<1-32>	Specify the bridge group ID.
disable	Disable spanning tree on the interface.
enable	Enable spanning tree on the interface.

### Default

Spanning-tree is enabled by default

### Command Mode

Interface mode

### Example

```
(config)#interface eth1  
(config-if)#bridge-group 1 spanning-tree enable
```



---

## clear spanning-tree detected protocols

Use this command to clear the detected protocols for a specific bridge or interface. This command begins the port migration as per IEEE 802.1w-2001, Section 17.26. After issuing this command, the migration timer is started on the port, only if the force version is RSTP or MSTP (greater versions of RSTP).

### Command Syntax

```
clear spanning-tree detected protocols bridge <1-32>
clear spanning-tree detected protocols interface INTERFACE
```

### Parameters

<1-32>	Specify the bridge group ID.
INTERFACE	Specify the name of the interface on which protocols have to be cleared.

### Command Mode

Exec mode and Privileged Exec mode

### Example

```
#clear spanning-tree detected protocols bridge 2
```

---

## clear spanning-tree statistics

Use this command to clear all STP BPDU statistics.

### Command Syntax

```
clear spanning-tree statistics bridge <1-32>
clear spanning-tree statistics interface IFNAME (instance (<1-63>|spbm) | vlan <1-4094>) bridge <1-32>
clear spanning-tree statistics (interface IFNAME | (instance (<1-63>|spbm) | vlan <2-4094>)) bridge <1-32>
```

### Parameters

<1-32>	Specify the bridge identifier.
IFNAME	Specify the name of the interface on which protocols have to be cleared.
<1-63>	MST instance ID.
spbm	Shortest Path Bridging - MAC instance.
<1-4094>	VLAN identifier where spanning tree is located <2-4094>

### Command Mode

Exec mode and Privileged Exec mode

#### Example

```
(config-if)#clear spanning-tree statistics bridge 32
```

---

## customer-spanning-tree customer-edge path-cost

Use this command to set the cost of a path associated with a customer edge port on a customer edge spanning tree.

Use the `no` form of this command to remove the cost of a path associated with a customer edge port on a customer edge spanning tree.

### Command Syntax

```
customer-spanning-tree customer-edge path-cost <1-200000000>
no customer-spanning-tree customer-edge path-cost
```

### Parameters

<code>path-cost</code>	Specify the path-cost of a port.
<code>&lt;1-200000000&gt;</code>	Specify the cost to be assigned to the group.

### Command Mode

Interface mode

### Example

```
#configure terminal
(config)#interface eth1
(config-if)#customer-spanning-tree customer-edge path-cost 1000
```

---

## customer-spanning-tree customer-edge priority

Use this command to set the port priority for a customer-edge port in the customer spanning tree.

### Command Syntax

```
customer-spanning-tree customer-edge priority <0-240>
```

### Parameters

priority	Specify the port priority.
<0-240>	Specify the port priority range (a lower priority indicates greater likelihood of the interface becoming a root). The priority values can only be set in increments of 16.

### Default

The default priority is 1.

### Command Mode

Interface mode

### Example

```
#configure terminal
(config)#interface eth1
(config-if)#customer-spanning-tree customer-edge priority 100
```

---

## customer-spanning-tree forward-time

Use this command to set the time (in seconds) after which (if this bridge is the root bridge) each port changes states to learning and forwarding. This value is used by all instances.

Use the `no` form of this command to restore the default value of 15 seconds.

### Command Syntax

```
customer-spanning-tree forward-time <4-30>
no customer-spanning-tree forward-time
```

### Parameters

<4-30>                      Specify the forwarding time delay in seconds.

Note: Care should be exercised if the value is set to less than 7 seconds.

### Default

The default priority is 15 seconds.

### Command Mode

Interface mode

### Examples

```
#configure terminal
(config)#interface eth1
(config-if)#customer-spanning-tree forward-time 6

(config-if)#no customer-spanning-tree forward-time
```

---

## customer-spanning-tree hello-time

Use this command to set the hello-time, the time in seconds after which (if this bridge is the root bridge) all the bridges in a bridged LAN exchange Bridge Protocol Data Units (BPDUs). Avoid a very low value of this parameter as this can lead to excessive traffic on the network; a higher value delays the detection of topology change. This value is used by all instances.

Use the `no` option with this command to restore the default value of the hello-time.

### Command Syntax

```
customer-spanning-tree hello-time <1-10>
no customer-spanning-tree hello-time
```

### Parameters

<1-10>                      Specify the hello BPDU interval in seconds.

### Default

The default level is 2 seconds.

### Command Mode

Interface mode

### Examples

```
#configure terminal
(config)#interface eth1
(config-if)#customer-spanning-tree hello-time 3

(config-if)#no customer-spanning-tree hello-time
```

---

## customer-spanning-tree max-age

Use this command to set the max-age for a bridge.

Max-age is the maximum time in seconds for which (if a bridge is the root bridge) a message is considered valid. This prevents the frames from looping indefinitely. The value of max-age should be greater than twice the value of hello-time plus one, but less than twice the value of forward delay minus one. The allowable range for max-age is 6-40 seconds. Configure this value sufficiently high, so that a frame generated by a root can be propagated to the leaf nodes without exceeding the max-age.

Use the `no` parameter with this command to restore the default value of max-age.

### Command Syntax

```
customer-spanning-tree max-age <6-40>
no customer-spanning-tree max-age
```

### Parameters

`<6-40>` Specify the maximum time in seconds to listen for the root bridge.

### Default

The default value of bridge max-age is 20 seconds.

### Command Mode

Interface mode

### Examples

```
#configure terminal
(config)#interface eth1
(config-if)#customer-spanning-tree max-age 12

(config-if)#no customer-spanning-tree max-age
```

---

## customer-spanning-tree priority

Use this command to set the bridge priority for the spanning tree on a customer edge port. Using a lower priority indicates a greater likelihood of the bridge becoming root. This command must be used to set the priority of the customer spanning tree running on the customer edge port.

Use the `no` form of the command to reset it to the default value.

### Command Syntax

```
customer-spanning-tree priority <0-61440>
no customer-spanning-tree priority
```

### Parameters

<0-61440>                Specify the bridge priority in the range <0-61440>. Priority values can be set only in increments of 4096.

### Default

The default priority is 61440

### Command Mode

Interface mode

### Examples

```
#configure terminal
(config)#interface eth1
(config-if)#customer-spanning-tree priority 4096

(config-if)#no customer-spanning-tree priority
```



---

## customer-spanning-tree provider-edge path-cost

Use this command to set the cost of a path associated with a provider edge port on a customer edge spanning tree.

Use the `no` form of this command to remove the cost of a path associated with a provider edge port on a customer edge spanning tree.

### Command Syntax

```
customer-spanning-tree provider-edge svlan <1-4094> path-cost <1-200000000>
no customer-spanning-tree provider-edge svlan <1-4094> path-cost
```

### Parameters

<1-4094>	Specify the SVLAN identifier of provider edge port.
<1-200000000>	Specify the cost to be assigned to the group.

### Command Mode

Interface mode

### Examples

```
#configure terminal
(config)#interface eth1
(config-if)#customer-spanning-tree provider-edge svlan 2 path-cost 1000

(config-if)#no customer-spanning-tree provider-edge svlan 2 path-cost
```

---

## customer-spanning-tree provider-edge priority

Use this command to set the port priority for a provider-edge port in the customer spanning tree.

### Command Syntax

```
customer-spanning-tree provider-edge svlan <1-4094> priority <0-240>
```

### Parameters

<1-4094>	Specify the SVLAN identifier of provider edge port.
<0-240>	Specify the port priority (a lower priority means greater likelihood of the interface becoming root). The priority values can only be set in increments of 16.

### Default

The default priority is 1.

### Command Mode

Interface mode

### Example

```
#configure terminal
(config)#interface eth1
(config-if)#customer-spanning-tree provider-edge svlan 2 priority 0
```

---

## customer-spanning-tree transmit-holdcount

Use this command to set the transmit-holdcount for a bridge.

Use the `no` parameter with this command to restore the default value of `transmit-holdcount`.

### Command Syntax

```
customer-spanning-tree transmit-holdcount <1-10>
no customer-spanning-tree transmit-holdcount
```

### Parameters

`<1-10>` Specify the maximum number that can be transmitted per second.

### Default

The default value of bridge transmit hold count is 6.

### Command Mode

Interface mode

### Examples

```
#configure terminal
(config)#interface eth1
(config-if)#customer-spanning-tree transmit-holdcount 3

(config-if)#no customer-spanning-tree transmit-holdcount
```

---

### debug mstp

Use this command to turn on, and turn off, debugging and echoing data to the console, at various levels.

**Note:** This command enables MSTP, RSTP, and STP debugging.

Use the `no` parameter with this command to turn off debugging.

#### Command Syntax

```
debug mstp all
debug mstp cli
debug mstp packet rx
debug mstp packet tx
debug mstp protocol
debug mstp protocol detail
debug mstp timer
debug mstp timer detail
no debug mstp all
no debug mstp cli
no debug mstp packet rx
no debug mstp packet tx
no debug mstp protocol
no debug mstp protocol detail
no debug mstp timer
no debug mstp timer detail
```

#### Parameters

<code>all</code>	Echoes all spanning-tree debugging levels to the console.
<code>cli</code>	Echoes spanning-tree commands to the console.
<code>packet</code>	Echoes spanning-tree packets to the console.
<code>rx</code>	Received packets.
<code>tx</code>	Transmitted packets.
<code>protocol</code>	Echoes protocol changes to the console.
<code>detail</code>	Detailed output.
<code>timer</code>	Echoes timer start to the console.
<code>detail</code>	Detailed output.

#### Command Mode

Exec, Privileged Exec, and Configure modes

#### Examples

```
#configure terminal
```

```
(config)#debug mstp all
(config)#debug mstp cli
(config)#debug mstp packet rx
(config)#debug mstp protocol detail
(config)#debug mstp timer
```

---

## instance vlan

Use this command to create an instance(s) of a VLAN for the default bridge (0). This command can be used only after the VLANs are defined; that is, LANs must be created before being associated with an MST instance (MSTI).

Use the `no` parameter with this command to delete the instance of the VLAN.

### Command Syntax

```
instance <1-63> vlan VLANID
no instance <1-63> vlan VLANID
```

### Parameters

<1-63>	Specify the instance ID.
VLANID	VLAN identifier(s) <2-4094>. You can specify a single VLAN, a VLAN range, or a VLAN list.  For a VLAN range, specify two VLAN identifiers: the lowest and then the highest separated by a hyphen. For a VLAN list, specify the VLAN identifiers separated by commas. Do not enter spaces between the hyphens or commas.

### Command Mode

MST configure mode

### Examples

```
#configure terminal
(config)#bridge 2 protocol mstp
(config)#spanning-tree mst configuration
(config-mst)#instance 2 vlan 30
```

---

## region

Use this command to create an MST region of the default bridge, and specify a name to it.

Use the `no` parameter with this command to delete the region.

### Command Syntax

```
region REGION_NAME
no region REGION_NAME
```

### Parameters

REGION\_NAME      Specify the name of the region.

### Command Mode

MST configure mode

### Examples

```
#configure terminal
(config)#spanning-tree mst configuration
(config-mst)#region IPI
```

---

## revision

Use this command to specify the revision level of the default bridge.

### Command Syntax

```
revision <0-65535>
```

### Parameters

<0-65535>            Specify the revision number in the range of 0-65535.

### Default

Default value of the revision number is 0.

### Command Mode

MST configure mode

### Examples

```
#configure terminal
(config)#spanning-tree mst configuration
(config-mst)#revision 25
```



---

## show debugging mstp

Use this command to display the status of debugging of the MSTP system.

### Command Syntax

```
show debugging mstp
```

### Parameters

None

### Command Mode

Exec mode and Privilege Exec mode

### Examples

```
#show debugging mstp
MSTP debugging status:
MSTP debugging status:
MSTP timer debugging is on
MSTP protocol debugging is on
MSTP detailed protocol debugging is on
MSTP cli echo debugging is on
MSTP transmitting packet debugging is on
MSTP receiving packet debugging is on
#
```

---

## show spanning-tree

Use this command to show the state of the spanning tree for all STP or RSTP bridge-groups, including named interface and VLANs.

### Command Syntax

```
show spanning-tree
show spanning-tree interface IFNAME
show spanning-tree mst
show spanning-tree mst config
show spanning-tree mst interface IFNAME
show spanning-tree mst detail
show spanning-tree mst detail interface IFNAME
show spanning-tree mst instance (<1-63> | spbm) interface IFNAME
show spanning-tree mst instance (<1-63> | spbm | te-msti)
show spanning-tree rpvst+
show spanning-tree rpvst+ config
show spanning-tree rpvst+ detail
show spanning-tree rpvst+ detail interface IFNAME
show spanning-tree rpvst+ interface IFNAME
show spanning-tree rpvst+ vlan <1-4094>
show spanning-tree rpvst+ vlan <1-4094> interface IFNAME
show spanning-tree statistics bridge <1-32>
show spanning-tree statistics interface IFNAME (instance (<1-63>|spbm) | vlan <2-4094>) bridge <1-32>
show spanning-tree statistics (interface IFNAME | (instance (<1-63>|spbm) | vlan <1-4094>)) bridge <1-32>
show spanning-tree vlan range-index
```

### Parameters

interface	Display interface information
mst	Display MST information
rpvst+	Display RPVST information
statistics	Display statistics of the BPDUs
vlan range-index	Display a VLAN range-index value

### Command Mode

Exec mode and Privilege Exec mode

## Example

The following is a sample output of this command displaying spanning tree information.

```
#show spanning-tree
% 1: Bridge up - Spanning Tree Enabled
% 1: Root Path Cost 0 - Root Port 0 - Bridge Priority 32768
% 1: Forward Delay 15 - Hello Time 2 - Max Age 20
% 1: Root Id 80000002b328530a
% 1: Bridge Id 80000002b328530a
% 1: last topology change Wed Nov 19 22:39:18 2008
% 1: 11 topology change(s) - last topology change Wed Nov 19 22:39:18 2008
% 1: portfast bpdu-filter disabled
% 1: portfast bpdu-guard disabled
% 1: portfast errdisable timeout disabled
% 1: portfast errdisable timeout interval 300 sec
%eth2: Ifindex 5 - Port Id 8005 - Role Designated - State Forwarding
%eth2: Designated Path Cost 0
%eth2: Configured Path Cost 200000 - Add type Explicit ref count 1
%eth2: Designated Port Id 8005 - Priority 128 -
%eth2: Root 80000002b328530a
%eth2: Designated Bridge 80000002b328530a
%eth2: Message Age 0 - Max Age 20
%eth2: Hello Time 2 - Forward Delay 15
%eth2: Forward Timer 0 - Msg Age Timer 0 - Hello Timer 1 - topo change timer 0
%eth2: forward-transitions 4
%eth2: Version Rapid Spanning Tree Protocol - Received RSTP - Send RSTP
%eth2: No portfast configured - Current portfast off
%eth2: portfast bpdu-guard default - Current portfast bpdu-guard off
%eth2: portfast bpdu-filter default - Current portfast bpdu-filter off
%eth2: no root guard configured- Current root guard off
%eth2: Configured Link Type point-to-point - Current point-to-point
%eth1: Ifindex 4 - Port Id 8004 - Role Designated - State Forwarding
%eth1: Designated Path Cost 0
%eth1: Configured Path Cost 200000 - Add type Explicit ref count 1
%eth1: Designated Port Id 8004 - Priority 128 -
%eth1: Root 80000002b328530a
%eth1: Designated Bridge 80000002b328530a
%eth1: Message Age 0 - Max Age 20
%eth1: Hello Time 2 - Forward Delay 15
%eth1: Forward Timer 0 - Msg Age Timer 0 - Hello Timer 1 - topo change timer 0
%eth1: forward-transitions 4
%eth1: Version Rapid Spanning Tree Protocol - Received None - Send RSTP
%eth1: No portfast configured - Current portfast off
%eth1: portfast bpdu-guard default - Current portfast bpdu-guard off
%eth1: portfast bpdu-filter default - Current portfast bpdu-filter off
%eth1: no root guard configured- Current root guard off
%eth1: Configured Link Type point-to-point - Current point-to-point
%
%
```

The following is a sample output of this command displaying the state of the spanning tree for interface `eth1`.

```
#show spanning-tree interface eth1
% 1: Bridge up - Spanning Tree Enabled
% 1: Root Path Cost 0 - Root Port 0 - Bridge Priority 32768
% 1: Forward Delay 15 - Hello Time 2 - Max Age 20
% 1: Root Id 80000002b328530a
% 1: Bridge Id 80000002b328530a
% 1: last topology change Wed Nov 19 22:39:18 2008
% 1: 11 topology change(s) - last topology change Wed Nov 19 22:39:18 2008
% 1: portfast bpdu-filter disabled
% 1: portfast bpdu-guard disabled
% 1: portfast errdisable timeout disabled
% 1: portfast errdisable timeout interval 300 sec
% eth1: Ifindex 4 - Port Id 8004 - Role Designated - State Forwarding
% eth1: Designated Path Cost 0
% eth1: Configured Path Cost 200000 - Add type Explicit ref count 1
% eth1: Designated Port Id 8004 - Priority 128 -
% eth1: Root 80000002b328530a
% eth1: Designated Bridge 80000002b328530a
% eth1: Message Age 0 - Max Age 20
% eth1: Hello Time 2 - Forward Delay 15
% eth1: forward-transitions 4
% eth1: Version Rapid Spanning Tree Protocol - Received None - Send RSTP
% eth1: No portfast configured - Current portfast off
% eth1: portfast bpdu-guard default - Current portfast bpdu-guard off
% eth1: portfast bpdu-filter default - Current portfast bpdu-filter off
% eth1: no root guard configured- Current root guard off
```

---

## show spanning-tree mst

Use this command to display the filtering database values. This command displays the number of instances created, and VLANs associated with it.

### Command Syntax

```
show spanning-tree mst
show spanning-tree mst config
show spanning-tree mst detail
show spanning-tree mst detail interface IFNAME
show spanning-tree mst instance (<1-63> | spbm) interface IFNAME
show spanning-tree mst instance (<1-63> | spbm | te-msti)
show spanning-tree mst interface IFNAME
```

### Parameters

config	Display configuration information.
detail	Display detailed information.
interface	Display interface information.
instance	Display instance information.
<1-63>	Specify the instance identifier.
spbm	Shortest Path Bridging - MAC instance.
te-msti	Traffic Engineering MSTI instance.

### Command Mode

Exec mode and Privilege Exec mode

### Examples

```
#show spanning-tree mst
% 1: Bridge up - Spanning Tree Enabled
% 1: CIST Root Path Cost 0 - CIST Root Port 0 - CIST Bridge
Priority 32768
% 1: Forward Delay 15 - Hello Time 2 - Max Age 20 - Max-hops 20
% 1: CIST Root Id 80000002b328530a
% 1: CIST Reg Root Id 80000002b328530a
% 1: CIST Bridge Id 80000002b328530a
% 1: 2 topology change(s) - last topology change Wed Nov 19 22:43:21 2008
% 1: portfast bpdu-filter disabled
% 1: portfast bpdu-guard disabled
```

```
% 1: portfast errdisable timeout disabled
% 1: portfast errdisable timeout interval 300 sec%
% Instance VLAN
% 0:          1
% 2:          3-4
```

## show spanning-tree statistics

Use this command to display detailed BPDU statistics for a spanning tree instance, or for a VLAN in the case of RPVST+.

### Command Syntax

```
show spanning-tree statistics bridge (default|<1-32>)
show spanning-tree statistics interface IFNAME (instance (<1-63>|spbm) | vlan <2-4094>) bridge (default|<1-32>)
show spanning-tree statistics (interface IFNAME | (instance (<1-63>|spbm) | vlan <1-4094>)) bridge (default|<1-32>)
```

### Parameters

<1-32>	Bridge identifier.
default	Default bridge.
<1-63>	MST instance identifier.
spbm	Shortest Path Bridging - MAC instance.
IFNAME	Interface name.
<2-4094>	When RPVST+ is configured, a VLAN identifier.

### Command Mode

Exec mode and Privilege Exec mode

### Example

In the following example, bridge-group 1 is configured for IEEE, and bridge-group 1 is configured on the eth2 interface of TSUP42, and the eth3 interface of TSUP41. When the command is executed as follows, the output displays statistics for interface eth2 only:

```
TSUP42#show spanning-tree statistics interface eth2 bridge 1

% BPDU Related Parameters
% -----
% Port Spanning Tree           : Enable
% Spanning Tree Type           : Spanning Tree Protocol
% Current Port State           : Learning
% Port ID                      : 8004
% Port Number                   : 4
% Path Cost                    : 200000
% Message Age                  : 0
% Designated Root              : 00:02:b3:d5:91:ec
% Designated Cost              : 0
% Designated Bridge            : 00:02:b3:d5:91:ec
% Designated Port Id           : 8005
% Top Change Ack               : FALSE
% Configure Pending            : FALSE

% PORT Based Information & Statistics
% -----
% Configure Bpdu's xmitted      : 0
```

```
% Configure Bpdu's received          : 22
% TCN Bpdu's xmitted                 : 0
% TCN Bpdu's received                : 8
% Forward Trans Count                 : 0

% STATUS of Port Timers
% -----
% Hello Time Configured               : 2
% Hello timer                         : ACTIVE
% Hello Time Value                    : 1
% Forward Delay Timer                 : ACTIVE
% Forward Delay Timer Value           : 1
% Message Age Timer                   : ACTIVE
% Message Age Timer Value             : 19
% Topology Change Timer               : INACTIVE
% Topology Change Timer Value         : 0
% Hold Timer                          : INACTIVE
% Hold Timer Value                    : 0

% Other Port-Specific Info
% -----
% Max Age Transitions                 : 1
% Msg Age Expiry                      : 0
% Similar BPDUS Rcvd                 : 14
% Src Mac Count                       : 0
% Total Src Mac Rcvd                  : 15
% Next State                          : Blocked
% Topology Change Time                : 0

% Other Bridge information & Statistics
% -----
% STP Multicast Address                : 01:80:c2:00:00:00
% Bridge Priority                      : 32768
% Bridge Mac Address                   : 00:02:b3:d5:98:3f
% Bridge Hello Time                   : 2
% Bridge Forward Delay                : 15
% Topology Change Initiator           : 0
% Last Topology Change Occurred        : Wed Dec 31 16:00:00 1969
% Topology Change                     : FALSE
% Topology Change Detected             : FALSE
% Topology Change Count                : 0
% Topology Change Last Recvd from      : 00:00:00:00:00:00
```



---

## show storm-control

Use this command to display storm control information for all interfaces or for a particular interface.

### Command Syntax

```
show storm-control (IFNAME|)
```

### Parameters

IFNAME                      The name of the interface.

### Command Mode

Exec mode and Privileged Exec mode

### Example

The following is a sample output of this command displaying storm control information:

```
#show storm-control eth1
Port      BcastLevel BcastDiscards McastLevel McastDiscards DlfLevel
DlfDiscards
fe14      40. 0%      64290164      100. 0%      64290164      100. 0%      64290164
```

---

## show traffic-class-table

Use this command to display the data in the traffic class table.

### Command Syntax

```
show traffic-class-table interface IFNAME
```

### Parameters

`interface`            Displays the interface name.

### Command Mode

Exec mode and Privilege Exec mode

### Example

The following is a sample output of this command displaying the traffic class table for interface `eth1`.

```
#show traffic-class-table interface eth1
User Prio / Num Traffic Classes
      1  2  3  4  5  6  7  8
0     0  0  0  0  0  0  0  0
1     0  0  0  0  0  0  0  0
2     0  0  0  0  0  0  0  0
3     0  0  0  0  0  0  0  0
4     0  0  0  0  0  0  0  0
5     0  0  0  0  0  0  0  0
6     0  0  0  0  0  0  0  0
```

---

## show user-priority

Use this command to display the user priority data.

### Command Syntax

```
show user-priority interface IFNAME
```

### Parameters

<code>interface</code>	Displays the interface name.
------------------------	------------------------------

### Command Mode

Exec mode and Privilege Exec mode

### Example

The following is a sample output of this command displaying set user priority for interface `eth4`.

```
#show user-priority interface eth4
Default user priority: 7
```

---

## spanning-tree acquire

Use this command to enable the default bridge to learn station location information for an instance. This helps in making forwarding decisions.

Use the `no` parameter with this command to disable learning.

### Command Syntax

```
spanning-tree acquire
no spanning-tree acquire
```

### Parameters

None

### Default

Learning is enabled by default for all instances.

### Command Mode

Configure mode

### Examples

```
#configure terminal
(config)#spanning-tree acquire
```

---

## spanning-tree autoedge

Use this command to assist in automatic identification of the edge port.

Use the `no` parameter with this command to disable this feature.

### Command Syntax

```
spanning-tree autoedge
no spanning-tree autoedge
```

### Parameters

None

### Command Mode

Interface mode

### Example

```
#configure terminal
(config)#interface eth0
(config-if)#spanning-tree autoedge
```

---

## spanning-tree disable

Use this command to disable spanning tree on an interface for the default bridge.

Note: If switchport is not configured on the given interface, this command has no effect.

### Command Syntax

```
spanning-tree disable
```

### Parameters

None

### Default

Spanning-tree is enabled if the `switchport` command is configured.

### Command Mode

Interface mode

### Example

```
#configure terminal
(config)#interface eth0
(config-if)#spanning-tree disable
```

---

## spanning-tree edgeport

Use this command to set a port as an edge-port and to enable rapid transitions.

Use the `no` parameter with this command to set a port to its default state (not an edge-port) and to disable rapid transitions.

**Note:** This command is an alias to the `spanning-tree portfast` command. Both commands can be used interchangeably.

### Command Syntax

```
spanning-tree edgeport
no spanning-tree edgeport
```

### Parameters

None

### Command Mode

Interface mode

### Example

```
#configure terminal
(config)#interface eth0
(config-if)#spanning-tree edgeport
```

---

## spanning-tree enable

Use this command to enable spanning tree on an interface for the default bridge.

Note: If switchport is not configured on the given interface, this command has no effect.

### Command Syntax

```
spanning-tree enable
```

### Parameters

None

### Default

Spanning-tree is enabled if the `switchport` command is configured.

### Command Mode

Interface mode

### Example

```
#configure terminal
(config)#interface eth0
(config-if)#spanning-tree enable
```



---

## spanning-tree guard

Use this command to enable the root guard feature for the port. This feature disables reception of superior BPDUs.

The root guard feature makes sure that the port on which it is enabled is a designated port. If the root guard enabled port receives a superior BPDU, it goes to a Listening state (for STP) or discarding state (for RSTP and MSTP).

Use the `no` parameter with this command to disable the root guard feature for the port.

### Command Syntax

```
spanning-tree guard root
no spanning-tree guard root
```

### Parameters

<code>root</code>	Set to disable reception of superior BPDUs
-------------------	--

### Command Mode

Interface mode

### Example

```
#configure terminal
(config)#interface eth0
(config-if)#spanning-tree guard root
```

---

## spanning-tree hello-time

Use this command to set the hello-time, the time in seconds after which (if this bridge is the root bridge) all the default bridges in a bridged LAN exchange Bridge Protocol Data Units (BPDUs). A very low value of this parameter leads to excessive traffic on the network, while a higher value delays the detection of topology change. This value is used by all instances.

Use the `no` parameter with this command to return to the default value for the hello time.

### Command Syntax

```
spanning-tree hello-time <1-10>
```

```
no spanning-tree hello-time
```

### Parameter

<1-10>

Hello BPDU interval in seconds. The allowable range of values is 1-10 seconds. However, make sure that the value of the hello time is always greater than the value of the hold time (1 second by default).

### Default

The default hello-time value is 2.

### Command Mode

Interface mode

### Examples

```
#configure terminal
(config)#interface eth0
(config-if)#spanning-tree hello-time 5

(config-if)#no spanning-tree hello-time
```

---

## spanning-tree instance restricted-role

Use this command to set the restricted role value for the instance to TRUE.

Use the `no` parameter with this command to set the restricted role value for the instance to FALSE.

### Command Syntax

```
spanning-tree instance <1-63> restricted-role
no spanning-tree instance <1-63> restricted-role
```

### Parameters

`<1-63>` Specify the instance ID range.

### Default

The default restricted-role value is FALSE.

### Command Mode

Interface mode

### Example

```
#configure terminal
(config)#interface eth0
(config-if)#spanning-tree instance 2 restricted-role
```

---

## spanning-tree instance restricted-tcn

Use this command to set the restricted TCN value for the instance to TRUE.

### Command Syntax

```
spanning-tree instance <1-63> restricted-tcn
no spanning-tree instance <1-63> restricted_tcn
```

### Parameters

<1-63>                      Specify the instance ID range.

### Default

The default restricted TCN value is FALSE.

### Command Mode

Interface mode

### Example

```
#configure terminal
(config)#interface eth0
(config-if)#spanning-tree instance 2 restricted-tcn
```

---

## spanning-tree link-type

Use this command to enable or disable point-to-point or shared link types.

RSTP has a backward-compatible STP mode, `spanning-tree link-type shared`. An alternative is the `spanning-tree force-version 0`.

Use the `no` parameter with this command to disable rapid transition.

### Command Syntax

```
spanning-tree link-type auto
spanning-tree link-type point-to-point
spanning-tree link-type shared
no spanning-tree link-type
```

### Parameters

<code>auto</code>	Sets to either point-to-point or shared based on duplex state.
<code>point-to-point</code>	Enables rapid transition.
<code>shared</code>	Disables rapid transition.

### Command Mode

Interface mode

### Examples

```
#configure terminal
(config)#interface eth0
(config-if)#spanning-tree link-type point-to-point

(config-if)#no spanning-tree link-type
```

---

## spanning-tree mode

Use this command to set the spanning tree to a specific mode.

### Command Syntax

```
spanning-tree mode (stp|stp-vlan-bridge|rstp|rstp-vlan-bridge|mstp|provider-  
rstp|provider-mstp) (edge|)
```

```
spanning-tree mode (stp|stp-vlan-bridge|rstp|rstp-vlan-bridge|rpvst+|mstp|  
provider-rstp|provider-mstp) (edge|)
```

### Parameters

mstp	Configure as an MSTP mode
provider-mstp	Configure as a provider MSTP mode
provider-rstp	Configure as a provider RSTP mode
rpvst+	Configure as a VLAN aware RPVST+ mode
rstp	Configure as an RSTP mode
rstp-vlan-bridge	
	Configure as a VLAN aware RSTP mode
stp	Configure as an STP mode
stp-vlan-bridge	Configure as a VLAN aware STP mode
edge	Configure any mode as an edge bridge

### Command Mode

Configure mode

### Example

```
#configure terminal  
(config)#spanning-tree mode mstp  
  
(config)#spanning-tree mode provider-mstp edge  
  
(config)#spanning-tree mode rstp-vlan-bridge edge
```

---

## spanning-tree mst configuration

Use this command to enter the Multiple Spanning Tree Configuration mode.

### Command Syntax

```
spanning-tree mst configuration
```

### Parameters

None

### Command Mode

Configure mode

### Examples

```
#configure terminal
(config)#spanning-tree mst configuration
(config-mst)#
```

---

## spanning-tree bpdu-filter

Use this command to set the BPDU filter value for individual ports. When the `enable` or `disable` parameter is used with this command, this configuration takes precedence over bridge configuration. However, when the `default` parameter is used with this command, the bridge level BPDU filter configuration takes effect for the port.

Use the `show spanning tree` command to display administratively configured and currently running values of the BPDU filter parameter for the bridge and port (see [show spanning-tree](#) on page 98).

Use the `no` parameter with this command to revert the port BPDU filter value to default.

### Command Syntax

```
spanning-tree bpdu-filter (enable|disable|default)
no spanning-tree bpdu-filter
```

### Parameters

<code>default</code>	Sets the bpdu-filter to the default level.
<code>disable</code>	Disables the BPDU-filter.
<code>enable</code>	Enables the BPDU-filter.

### Command Mode

Interface mode

### Example

```
#configure terminal
(config)#interface eth0
(config-if)#spanning-tree bpdu-filter enable

(config-if)#no spanning-tree bpdu-filter
```



---

## spanning-tree bpdu-guard

Use this command to enable or disable the BPDU Guard feature on a port.

This command supersedes the bridge level configuration for the BPDU Guard feature. When the `enable` or `disable` parameter is used with this command, this configuration takes precedence over bridge configuration. However, when the `default` parameter is used with this command, the bridge-level BPDU Guard configuration takes effect.

Use the `show spanning tree` command to display administratively configured and currently running values of the BPDU filter parameter for the bridge and port (see [show spanning-tree](#) on page 98).

Use the `no` parameter with this command to set the BPDU Guard feature on a port to default.

### Command Syntax

```
spanning-tree bpdu-guard (enable|disable|default)
no spanning-tree bpdu-guard
```

### Parameters

<code>default</code>	Sets the BPDU-guard to the default level.
<code>disable</code>	Disables the BPDU-guard.
<code>enable</code>	Enables the BPDU-guard.

### Command Mode

Interface mode

### Example

```
#configure terminal
(config)#interface eth0
(config-if)#spanning-tree bpdu-guard enable

(config-if)#no spanning-tree bpdu-guard
```

---

## spanning-tree restricted-domain-role

Use this command to set the restricted-domain-role value of the port to TRUE.

Use the `no` parameter with this command to set the restricted-domain-role value of the port to FALSE.

### Command Syntax

```
spanning-tree restricted-domain-role
no spanning-tree restricted-domain-role
```

### Parameters

None

### Default

The default restricted-role value is FALSE.

### Command Mode

Interface mode

### Example

```
#configure terminal
(config)#interface eth0
(config-if)#spanning-tree restricted-domain-role
```

---

## spanning-tree restricted-role

Use this command to set the restricted-role value of the port to TRUE.

Use the `no` parameter with this command to set the restricted-role value of the port to FALSE.

### Command Syntax

```
spanning-tree restricted-role
no spanning-tree restricted-role
```

### Parameters

None

### Default

The default restricted-role value is FALSE.

### Command Mode

Interface mode

### Example

```
#configure terminal
(config)#interface eth0
(config-if)#spanning-tree restricted-role
```

---

## spanning-tree restricted-tcn

Use this command to set the restricted TCN value of the port to TRUE.

Use the `no` parameter with this command to set the restricted TCN value of the port to FALSE.

### Command Syntax

```
spanning-tree restricted-tcn
no spanning-tree restricted-tcn
```

### Parameters

None

### Default

The default restricted TCN value is FALSE.

### Command Mode

Interface mode

### Example

```
#configure terminal
(config)#interface eth0
(config-if)#spanning-tree restricted-tcn
```

---

## spanning-tree te-msti configuration

This command is used to put the terminal into the `te-msti` configuration mode.

After creating a bridge instance and adding VLAN to that bridge instance, use this command to enter `te-msti` configuration mode.

### Command Syntax

```
spanning-tree te-msti configuration
```

### Parameters

None

### Command Mode

Configure mode

### Examples

```
#configure terminal
(config)#spanning-tree te-msti configuration
(config-te-msti)#
```

---

## spanning-tree vlan

Use this command to set restrictions for the port of a particular VLAN.

Use the `no` parameter to unset restrictions for the port of a particular VLAN.

### Command Syntax

```
spanning-tree vlan <2-4094> restricted-role
spanning-tree vlan <2-4094> restricted-tcn
no spanning-tree vlan <2-4094> restricted-role
no spanning-tree vlan <2-4094> restricted-tcn
```

### Parameters

<code>&lt;2-4094&gt;</code>	Specify a VLAN identifier.
<code>restricted-role</code>	Specify the restrict the role of the port
<code>restricted-tcn</code>	Specify the restrict propagation of topology change notifications from the port

### Command Mode

Interface mode

### Examples

```
(config)#interface eth0
(config-if)#spanning-tree vlan 3 restricted-role

(config-if)#no spanning-tree vlan 3 restricted-role
```

---

## storm-control

Use this command to set the rising threshold level for broadcast, multicast, or destination lookup failure traffic. The storm control action occurs when traffic utilization reaches this level.

Storm control is used to block the forwarding of unnecessary flooded traffic. A packet storm occurs when a large number of broadcast packets are received on a port. Forwarding these packets can cause the network to slow down or time out.

Use the `no` form of this command to disable storm control.

### Command Syntax

```
storm-control (broadcast|multicast|dlf) level LEVEL
no storm-control (broadcast|multicast|dlf) level
```

### Parameters

<code>broadcast</code>	Broadcast rate limiting.
<code>multicast</code>	Multicast rate limiting.
<code>dlf</code>	Destination lookup failure limiting.
<code>level</code>	Sets the percentage of the threshold.
<code>LEVEL</code>	The percentage of the threshold; percentage of the maximum speed (pps) of the interface <0.00-100.00>.

### Default

By default, storm control is disabled.

### Command Mode

Interface mode

### Examples

```
#configure terminal
(config)#interface eth0
(config-if)#storm-control broadcast level 30

(config)#interface eth0
(config-if)#storm-control multicast level 30

(config)#interface eth0
(config-if)#no storm-control multicast level
```

---

## traffic-class-table

Use this command to set the user priority and number of supported traffic classes.

### Command Syntax

```
traffic-class-table user-priority <0-7> num-traffic-classes <1-8> value <0-7>
traffic-class-table user-priority <0-7> value <0-3>
```

### Parameters

user-priority	Specify the user priority associated with the traffic class table
<0-7>	User priority value
num-traffic-classes	
	Number of traffic classes
<1-8>	Number of traffic classes
value	Value to be used for the given user priority/num traffic classes
<0-7>	Value to be used for the given user priority classes
<0-3>	Value to be used for the given user priority classes

### Default

The default value for each user and traffic class is 0.

### Command Mode

Interface mode

### Example

```
#configure terminal
(config)#interface eth0
(config-if)#traffic-class-table user-priority 3 num-traffic-classes 4 value 5
```



---

## user-priority

Use this command to set the default user priority associated with the interface.

Use the `no` parameter to unset the default user priority associated with the interface.

### Command Syntax

```
user-priority <0-7>
no user-priority
```

### Parameters

`<0-7>`                      Set the user priority value.

### Command Mode

Interface mode

### Example

```
#configure terminal
(config)#interface eth1
(config-if)#user-priority 3

(config-if)#no user-priority
```

---

## user-priority-regen-table

Use this command to set the value for the mapping of user-priority to regenerated user-priority.

### Command Syntax

```
user-priority-regen-table user-priority <0-7> regenerated-user-priority <0-7>
```

### Parameters

<code>user-priority</code>	Port priority that has to be mapped.
<code>&lt;0-7&gt;</code>	Set the user priority value.
<code>regenerated-user-priority</code>	Specify the regenerated values to be used for the user priority.
<code>&lt;0-7&gt;</code>	Regenerated user priority value.

### Default

The default value is 0.

### Command Mode

Interface mode

### Examples

```
(config)#interface eth0
(config-if)#user-priority-regen-table user-priority 3 regenerated-user-
priority 5
```

## CHAPTER 5    RPVST+ Commands

---

This chapter contains the commands used to configure the Rapid Per VLAN Spanning Tree (RPVST+) Protocol. RPVST+ (Plus) enables a bridge to inter-operate with Cisco PRVST+ switches.

RPVST+ uses the Multiple Spanning Tree Protocol (MSTP) with a single VLAN for each Multiple Spanning Tree instance (MSTI). The MST bridges can have different spanning-tree topologies for different VLANs inside a region of similar MST bridges. MSTP, like the rapid spanning tree protocol (RSTP), provides rapid reconfiguration capabilities and supports load balancing.

This chapter includes the following commands:

- [bridge vlan](#) on page 132
- [bridge vlan priority](#) on page 133
- [bridge-group vlan](#) on page 134
- [bridge protocol rpvst+](#) on page 135
- [bridge rapid-pervlan-spanning-tree](#) on page 136
- [show bridge ieee](#) on page 137
- [show bridge mstp](#) on page 138
- [show spanning-tree interface](#) on page 139
- [show spanning-tree rpvst+](#) on page 140
- [spanning-tree rpvst+ configuration](#) on page 142
- [spanning-tree vlan restricted-role](#) on page 143
- [spanning-tree vlan restricted-tcn](#) on page 144

---

## bridge vlan

This command creates or deletes a mapping between an MSTI (Multiple Spanning Tree Instance) and a VLAN for RPVST+ operation. There can be only one VLAN per MST instance if the bridge is configured to run in RPVST+ mode. The VLAN must have already been created, otherwise an error is returned. Spanning tree is enabled on each configured VLAN, and one instance of spanning-tree runs on each configured VLAN.

Use the `no` form of the command to disable this functionality.

### Command Syntax

```
bridge <1-32> vlan <2-4094>
no bridge <1-32> vlan <2-4094>
```

### Parameters

<1-32>	Specify the bridge group ID.
vlan	Identity of the VLAN in the range of <2-4094>.

### Command Mode

RPVST+ Configure mode

### Examples

```
#configure terminal
(config)#spanning-tree rpvst+ configuration
(config-rpvst+)#bridge 1 vlan 2

(config-rpvst+)#no bridge 1 vlan 2
```

---

## bridge vlan priority

Use this command to create or delete a mapping between an MSTI and VLAN for RPVST+ operation. The bridge instance must already be configured for RPVST+ operation.

This command sets the priority value for the spanning-tree on the bridge. The lower the priority of the VLAN on a bridge, the better the chances of the bridge becoming a root bridge, or a designated bridge for the VLAN. The permitted range of values is 0-61440. Priority values can only be set in increments of 4096.

Use the `no` form of this command to restore the default value of the bridge priority.

### Command Syntax

```
bridge <1-32> vlan <2-4094> priority <0-61440>
no bridge <1-32> vlan <2-4094> priority
```

### Parameters

<code>&lt;1-32&gt;</code>	Specify the bridge group ID.
<code>vlan</code>	Identity of the VLAN in the range of <code>&lt;2-4094&gt;</code> .
<code>priority</code>	Specify the bridge priority for the common instance.
<code>&lt;0-61440&gt;</code>	Set the bridge priority in increments of 4096 (Lower priority indicates greater likelihood of becoming root).

### Default

The default value of `PRIORITY` for each VLAN is 32768.

### Command Mode

Configure mode

### Examples

```
#configure terminal
(config)#bridge 1 vlan 2 priority 80
(config)#no bridge 1 vlan 10 priority
```

---

## bridge-group vlan

Use this command to assign a Rapid Per-VLAN Spanning Tree (RPVST+) instance to a port.

The RPVST+ uses port priority as a tiebreaker to determine which port should forward frames for a particular LAN, or which port should be the root port for a VLAN. A lower value implies a better priority. In the case of the same priority, the interface index serves as the tiebreaker, with a lower-numbered interface being preferred over others.

Use the `no` parameter with this command to remove the RPVST+ instance from this port.

### Command Syntax

```
bridge-group <1-32> vlan <2-4094>
bridge-group <1-32> vlan <2-4094> path-cost <1-200000000>
bridge-group <1-32> vlan <2-4094> priority <0-240>
no bridge-group <1-32> vlan <2-4094>
no bridge-group <1-32> vlan <2-4094> path-cost
no bridge-group <1-32> vlan <2-4094> priority
```

### Parameters

<code>&lt;1-32&gt;</code>	Specify the bridge group ID.
<code>vlan</code>	Identity of the VLAN in the range of <code>&lt;2-4094&gt;</code> .
<code>path-cost</code>	Use this parameter to set the cost of a path associated with an interface.
<code>&lt;1-200000000&gt;</code>	Specify the cost to be assigned to the group.
<code>priority</code>	Use this parameter to set the port priority for a bridge group VLAN.
<code>&lt;0-240&gt;</code>	Specify the port priority range (a lower priority indicates greater likelihood of the interface becoming a root). The priority values can only be set in increments of 16.

### Command Mode

Interface mode

### Examples

```
#configure terminal
(config)#interface eth1
(config-if)#bridge-group 1 vlan 10

(config)#interface eth1
(config-if)#bridge-group 1 vlan 10 path-cost 1000

(config-if)#no bridge-group 1 vlan 10 path-cost

(config)#interface eth1
(config-if)#bridge-group 1 vlan 10 priority 240

(config-if)#no bridge-group 1 vlan 10 priority
```

---

## bridge protocol rpvst+

Use this command to enable Rapid Per-VLAN Spanning Tree on a bridge.

### Command Syntax

```
bridge <1-32> protocol rpvst+
```

### Parameter

<1-32>	Specify the bridge group ID.
--------	------------------------------

### Command Mode

Configure mode

### Example

```
#configure terminal
(config)#bridge 1 protocol rpvst+
```

---

## bridge rapid-pervlan-spanning-tree

Use this command to enable the Rapid Per-VLAN Spanning Tree Plus (RPVST+) functionality on a bridge.

Use the `no` form of the command to disable the RPVST+ functionality on a bridge.

### Command Syntax:

```
bridge <1-32> rapid-pervlan-spanning-tree enable
no bridge <1-32> rapid-pervlan-spanning-tree enable (bridge-forward|)
```

### Parameters

<code>&lt;1-32&gt;</code>	Specify the bridge-group ID.
<code>enable</code>	Enables the spanning tree protocol.
<code>bridge-forward</code>	(Optional) Puts all ports of the specified bridge into forwarding state.

### Default

When the `bridge-forward` option is used with the `no` parameter, the default behavior is to put all bridge ports in the blocking state.

### Command Mode

Configure mode

### Examples

```
#configure terminal
(config)#bridge 1 rapid-pervlan-spanning-tree enable

(config)#no bridge 1 rapid-pervlan-spanning-tree enable bridge-forward
```



---

## show bridge ieee

Use this command to display IEEE for RPVST+.

### Command Syntax

```
show bridge ieee
```

### Parameters

None

### Command Mode

Exec mode and Privileged Exec mode

### Example

```
#show bridge ieee  
bridge          CVLAN SVLAN BVLAN port      mac          fwd timeout
```

---

## show bridge mstp

Use this command to display MSTP information for RPVST+.

### Command Syntax

```
show bridge mstp
```

### Parameters

None

### Command Mode

Exec mode and Privileged Exec mode

### Example

```
#show bridge mstp  
bridge          CVLAN SVLAN BVLAN port      mac          fwd timeout
```

---

## show spanning-tree interface

Use this command to display spanning-tree information for an interface.

### Command Syntax

```
show spanning-tree interface IFNAME
```

### Parameter

IFNAME	Displays the interface name.
--------	------------------------------

### Command Mode

Exec mode and Privileged Exec mode

### Example

```
#show spanning-tree interface eth1
% Default: Bridge up - Spanning Tree Enabled
% Default: Root Path Cost 0 - Root Port 0 - Bridge Priority 32768
% Default: Forward Delay 15 - Hello Time 2 - Max Age 20
% Default: Root Id 80000002b3d58dba
% Default: Bridge Id 80000002b3d58dba
% Default: last topology change Wed Dec 31 16:00:00 1969
% 0: 0 topology change(s) - last topology change Wed Dec 31 16:00:00 1969

% Default: portfast bpdu-filter disabled
% Default: portfast bpdu-guard disabled
% Default: portfast errdisable timeout disabled
% Default: portfast errdisable timeout interval 300 sec
% eth1: Port Number 3 - Ifindex 3 - Port Id 8003 - Role Disabled - State
Discarding
% eth1: Designated Path Cost 0
% eth1: Configured Path Cost 2000000 - Add type Explicit ref count 1
% eth1: Designated Port Id 0 - Priority 128 -
% eth1: Message Age 0 - Max Age 0
% eth1: Hello Time 0 - Forward Delay 0
% eth1: Forward Timer 0 - Msg Age Timer 0 - Hello Timer 0 - topo change
timer
0
% eth1: forward-transitions 0
% eth1: Version Rapid Spanning Tree Protocol - Received None - Send RSTP
% eth1: No portfast configured - Current portfast off
% eth1: portfast bpdu-guard default - Current portfast bpdu-guard off
#
```

---

## show spanning-tree rpvst+

Use this command to display RPVST information.

### Command Syntax

```
show spanning-tree rpvst+
show spanning-tree rpvst+ config
show spanning-tree rpvst+ detail
show spanning-tree rpvst+ detail interface IFNAME
show spanning-tree rpvst+ interface IFNAME
show spanning-tree rpvst+ vlan <1-4094>
show spanning-tree rpvst+ vlan <1-4094> interface IFNAME
```

### Parameters

config	Display Configuration information.
detail	Display detailed information.
interface	Display detail interface information.
interface	Display interface information.
vlan	Display VLAN information
interface	Display interface information for a VLAN.

### Command Mode

Exec mode and Privilege Exec mode

### Example

The following displays output of this command without any parameters.

```
#show spanning-tree rpvst+

% 1: Bridge up - Spanning Tree Disabled
% 1: Root Path Cost 0 - Root Port 0 - Bridge Priority 32768
% 1: Forward Delay 15 - Hello Time 2 - Max Age 20
% 1: CIST Root Id 8000000000000000
% 1: CIST Bridge Id 8000000000000000
% 1: 0 topology change(s) - last topology change Wed Dec 31 16:00:00 1969

% 1: portfast bpdu-filter disabled
% 1: portfast bpdu-guard disabled
% 1: portfast errdisable timeout disabled
% 1: portfast errdisable timeout interval 300 sec
%
% Instance      VLAN
% 0:            1
#
```

The following displays output of this command with the `config` parameters.

```
#show spanning-tree rpvst+ config
%
% RPVST Configuration Information for bridge 1:
%-----
% Format Id      : 0
% Name          : Default
% Revision Level : 0
% Digest        : 0xAC36177F50283CD4B83821D8AB26DE62
%-----
#
```

The follow command displays detailed RPVST+ information about each VLAN and all interfaces associated with that VLAN.

```
#show spanning-tree rpvst+ detail

% 1: Bridge up - Spanning Tree Disabled
% 1: Root Path Cost 0 - Root Port 0 - Bridge Priority 32768
% 1: Forward Delay 15 - Hello Time 2 - Max Age 20
% 1: CIST Root Id 8000000000000000
% 1: CIST Bridge Id 8000000000000000
% 1: 0 topology change(s) - last topology change Wed Dec 31 16:00:00 1969

% 1: portfast bpdu-filter disabled
% 1: portfast bpdu-guard disabled
% 1: portfast errdisable timeout disabled
% 1: portfast errdisable timeout interval 300 sec
#
```

The follow command displays detailed RPVST+ information for the specified VLAN and all interfaces associated with the spanning-tree instance in that VLAN.

```
#show spanning-tree rpvst+ vlan 10
% vlan 10 Instance 0 configured
% bridge 1 vlan 10 not configured

% bridge 0 is not configured as RPVST+ bridge
#
```

The follow command displays RPVST+ information for the specified VLAN and a targeted interface associated with that VLAN.

```
#show spanning-tree rpvst+ vlan 2 interface eth1

% bridge 0 is not configured as RPVST bridge
#
```

---

## spanning-tree rpvst+ configuration

Use this command to put the terminal in RPVST+ configuration mode.

After creating a bridge and adding a VLAN to that bridge, use this command to go into RPVST+ configuration mode. Internally, an RSTP Instance is created for each configured VLAN.

### Command Syntax

```
spanning-tree rpvst+ configuration
```

### Parameters

None

### Command Mode

Configure mode

### Example

```
#configure terminal
(config)#spanning-tree rpvst+ configuration
(config-rpvst+)#
```

---

## spanning-tree vlan restricted-role

Use this command to set the restricted role value for the VLAN to TRUE.

Use the `no` parameter with this command to set the restricted role value for the VLAN to FALSE.

### Command Syntax

```
spanning-tree vlan <2-4094> restricted-role
no spanning-tree vlan <2-4094> restricted-role
```

### Parameters

`<2-4094>` Specify a VLAN identifier.

### Default

The default `restricted-role` value is FALSE.

### Command Mode

Interface mode

### Example

```
#configure terminal
(config)#interface eth0
(config-if)#spanning-tree vlan 10 restricted-role
```

---

## spanning-tree vlan restricted-tcn

Use this command to set the restricted TCN value for the VLAN to TRUE.

Use the `no` parameter with this command to set the restricted TCN value for the VLAN to FALSE.

### Command Syntax

```
spanning-tree vlan <2-4094> restricted-tcn
no spanning-tree vlan <2-4094> restricted_tcn
```

### Parameters

`<2-4094>` Specify a VLAN identifier.

### Default

The default `restricted-tcn` value is FALSE.

### Command Mode

Interface mode

### Example

```
#configure terminal
(config)#interface eth0
(config-if)#spanning-tree vlan 10 restricted-tcn
(config-if)#no spanning-tree vlan 10 restricted_tcn
```



## CHAPTER 6 802.1x Commands

---

This chapter provides a description, syntax, and examples of the 802.1X commands. It includes the following commands:

- [auth-mac auth-fail-action](#) on page 146
- [auth-mac disable](#) on page 147
- [auth-mac dynamic-vlan-creation](#) on page 148
- [auth-mac enable](#) on page 149
- [auth-mac mac-aging](#) on page 150
- [auth-mac system-auth-ctrl](#) on page 151
- [debug dot1x](#) on page 152
- [dot1x initialize](#) on page 153
- [dot1x keytxenabled](#) on page 154
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- [dot1x reauthMax](#) on page 158
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- [dot1x timeout re-authperiod](#) on page 161
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- [ip radius source-interface](#) on page 165
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- [show debugging dot1x](#) on page 171
- [show dot1x](#) on page 172
- [snmp restart auth](#) on page 175

---

## auth-mac auth-fail-action

Use this command to specify the required action after authentication fails for any source MAC (Media Access Control). If `drop-traffic` is specified, data destined to that MAC is dropped. The MAC will be added to the forwarding database in Discarded mode.

If `restrict-vlan` is specified, the unauthorized MAC is added to a restricted VLAN. The MAC will be added to the forwarding database in Forwarding mode.

### Command Syntax

```
auth-mac auth-fail-action (restrict-vlan <2-4094>|drop-traffic)
```

### Parameters

<code>drop-traffic</code>	Drops traffic destined to unauthorized source.
<code>restrict-vlan</code>	Adds unauthorized MAC address to restricted VLAN.
<code>&lt;2-4094&gt;</code>	Identity of the VLAN in the range of <2-4094>.

### Default

`drop-traffic`

### Command Mode

Interface mode

### Example

```
#configure terminal
(config)#interface eth0
(config-if)#auth-mac auth-fail-action restrict-vlan 12
```

---

## auth-mac disable

Use this command to disable MAC authentication on an interface. See the [auth-mac enable](#) command to enable MAC authentication on a interface.

### Command Syntax

```
auth-mac disable
auth-mac disable mode (filter|shutdown)
```

### Parameters

mode	Use this parameter to disable the MAC authentication mode on an interface.
filter	Filter the frames for the MAC when in an unauthorized state.
shutdown	Shut down the interface when the MAC is unauthenticated.

### Command Mode

Interface mode

### Example

```
#configure terminal
(config)#interface eth0
(config-if)#auth-mac disable

#configure terminal
(config)#interface eth0
(config-if)#auth-mac disable mode filter

(config)#interface eth0
(config-if)#auth-mac disable mode shutdown
```

---

## auth-mac dynamic-vlan-creation

Use this command to enable or disable dynamic VLAN creation after successful MAC authentication.

### Command Syntax

```
auth-mac dynamic-vlan-creation (enable|disable)
```

### Parameters

disable	Disables dynamic VLAN creation: after a successful authentication, the MAC will be added to the forwarding database with the default VLAN
enable	Enables dynamic VLAN creation: after a successful authentication, the MAC under authentication will be added to the VLAN identifier attribute in the radius server configuration file

### Default

Disabled

### Command Mode

Interface mode

### Examples

```
#configure terminal
(config)#interface eth0
(config-if)#auth-mac dynamic-vlan-creation disable

#configure terminal
(config)#interface eth0
(config-if)#auth-mac dynamic-vlan-creation enable
```

---

## auth-mac enable

Use this command to enable MAC authentication on an interface. See the [auth-mac disable](#) command to disable MAC authentication on an interface.

### Command Syntax

```
auth-mac enable
auth-mac enable mode (filter|shutdown)
```

### Parameters

mode	Use this parameter to enable the MAC authentication mode on an interface.
filter	Filter the frames for the MAC when in an unauthorized state.
shutdown	Shut down the interface when the MAC is unauthenticated.

### Command Mode

Interface mode

### Example

```
#configure terminal
(config)#interface eth0
(config-if)#auth-mac enable

#configure terminal
(config)#interface eth0
(config-if)#auth-mac enable mode filter

(config)#interface eth0
(config-if)#auth-mac enable mode shutdown
```

---

## auth-mac mac-aging

Use this command to either enable or disable MAC aging. When enabled, a MAC entry is added to the forwarding database, with aging time equal to the bridge aging time. Otherwise, the MAC entry will not be aged out. If MAC aging is disabled, the MAC entry will not be aged out.

### Command Syntax

```
auth-mac mac-aging (enable|disable)
```

### Parameters

<code>disable</code>	Disables MAC aging.
<code>enable</code>	Enables MAC aging.

### Command Mode

Interface mode

### Example

```
#configure terminal
(config)#interface eth0
(config-if)#auth-mac mac-aging disable

#configure terminal
(config)#interface eth0
(config-if)#auth-mac mac-aging enable
```

---

## auth-mac system-auth-ctrl

Use this command to enable MAC authentication globally. If MAC authentication is not enabled, other MAC authentication related commands throw an error when issued.

Use the `no` parameter with this command to disable MAC authentication globally.

### Command Syntax

```
auth-mac system-auth-ctrl
no auth-mac system-auth-ctrl
```

### Parameters

None

### Command Mode

Configure mode

### Examples

```
#configure terminal
(config)#auth-mac system-auth-ctrl

(config)#no auth-mac system-auth-ctrl
```

## debug dot1x

Use this command to turn on or turn off 802.1x debugging at various levels.

Use the `no` parameter with this command or the `undebug` command to turn off debugging.

### Command Syntax

```
debug dot1x (all|)
debug dot1x event
debug dot1x nsm
debug dot1x packet
debug dot1x timer
no debug dot1x (all|)
no debug dot1x event
no debug dot1x nsm
no debug dot1x packet
no debug dot1x timer
undebug dot1x (all|)
undebug dot1x event
undebug dot1x packet
undebug dot1x nsm
undebug dot1x timer
```

### Parameters

<code>all</code>	Sets debugging for all 802.1x levels.
<code>event</code>	Sets debugging for 802.1x events.
<code>nsm</code>	Sets debugging for 802.1x NSM information.
<code>packet</code>	Sets debugging for 802.1x packets.
<code>timer</code>	Sets debugging for 802.1x timer.

### Command Mode

Exec, Privileged Exec, and Configure modes

### Examples

```
#configure terminal
(config)#debug dot1x all
(config)#debug dot1x event
```



---

## dot1x initialize

Use this command to unauthorize a port, and attempt reauthentication on the specified interface.

### Command Syntax

```
dot1x initialize interface IFNAME
```

### Parameters

`interface` Specify the interface name for debugging.

### Command Mode

Privileged Exec

### Examples

```
#dot1x initialize interface eth0
```

---

## dot1x keytxenabled

Use this command to enable or disable key transmission over an Extensible Authentication Protocol (EAP) packet between the authenticator and supplicant.

### Command Syntax

```
dot1x keytxenabled (enable|disable)
```

### Parameters

disable	Disables the key transmission.
enable	Enables the key transmission.

### Command Mode

Interface mode

### Example

```
#configure terminal
(config)#interface eth0
(config-if) #dot1x keytxenabled disable

#configure terminal
(config)#interface eth0
(config-if) #dot1x keytxenabled enable
```

---

## dot1x port-control

Use this command to force a port state.

Use the `no` parameter with this command to remove a port from the 802.1x management.

### Command Syntax

```
dot1x port-control dir (in|both)
dot1x port-control (force-unauthorized|force-authorized|auto)
no dot1x port-control
```

### Parameters

<code>auto</code>	Specify to enable authentication on port.
<code>dir</code>	Specify the packet control direction.
<code>both</code>	Discard receive and transmit packets from the supplicant
<code>in</code>	Discard receive packets from the supplicant
<code>force-authorized</code>	
	Specify to force a port to always be in an authorized state.
<code>force-unauthorized</code>	
	Specify to force a port to always be in an unauthorized state.

### Command Mode

Interface mode

### Examples

```
#configure terminal
(config)#interface eth0
(config-if)#dot1x port-control auto

(config)#interface eth0
(config-if)#no dot1x port-control
```

---

## dot1x protocol-version

Use this command to set the protocol version of dot1x to 1 or 2. The protocol version must be synchronized with the Xsupplicant being used in that interface.

Use the `no` parameter with this command to set the protocol version to the default value (2).

### Command Syntax

```
dot1x protocol-version <1-2>
no dot1x protocol-version
```

### Parameters

<1-2>                      Indicates the EAP Over LAN (EAPOL) version.

### Default

The default dot1x protocol version is 2.

### Command Mode

Interface mode

### Example

```
#configure terminal
(config)#interface eth0
(config-if)#dot1x protocol-version 2

(config)#interface eth0
(config-if)#no dot1x protocol-version
```

---

## dot1x quiet-period

Use this command to set the quiet-period time interval.

When a switch cannot authenticate a client, the switch remains idle for a quiet-period interval of time, then tries again. By administratively changing the quiet-period interval, by entering a lower number than the default, a faster response time can be provided.

Use the `no` parameter with this command to set the configured quiet period to the default (60 seconds).

### Command Syntax

```
dot1x quiet-period <1-65535>
no dot1x quiet-period
```

### Parameter

`<1-65535>`                Seconds between the retrial of authentication.

### Default

The default dot1x protocol version is 2.

### Command Mode

Interface mode

### Example

```
#configure terminal
(config)#interface eth0
(config-if)#dot1x quiet-period 200
```

---

## dot1x reauthMax

Use this command to set the maximum reauthentication value, which sets the maximum number of reauthentication attempts after which the port will be unauthorized.

Use the `no` parameter with this command to set the reauthentication maximum to the default value (2).

### Command Syntax

```
dot1x reauthMax <1-10>
no dot1x reauthMax
```

### Parameter

<1-10>	Indicates the maximum number of reauthentication attempts after which the port will be unauthorized.
--------	--

### Default

The default is 2.

### Command Mode

Interface mode

### Examples

The following sets the maximum reauthentication value to 5.

```
#configure terminal
(config)#interface eth0
(config-if)#dot1x reauthMax 5
```

The following sets the reauthentication maximum to the default value.

```
#configure terminal
(config)#interface eth0
(config-if)#no dot1x reauthMax
```

---

## dot1x reauthentication

Use this command to enable reauthentication on a port.

Use the `no` parameter to disable reauthentication on a port.

### Command Syntax

```
dot1x reauthentication
no dot1x reauthentication
```

### Parameters

None

### Command Mode

Interface mode

### Examples

```
#configure terminal
(config)#interface eth0
(config-if)#dot1x reauthentication
```

---

## dot1x system-auth-ctrl

Use this command to enable globally authentication.

Use the `no` parameter to disable globally authentication.

### Command Syntax

```
dot1x system-auth-ctrl
no dot1x system-auth-ctrl
```

### Parameters

None

### Default

Authentication is off by default.

### Command Mode

Configure mode

### Example

```
#configure terminal
(config)#dot1x system-auth-ctrl
```



---

## dot1x timeout re-authperiod

Use this command to set the interval between reauthorization attempts.

Use the `no` parameter to disable the interval between reauthorization attempts.

### Command Syntax

```
dot1x timeout re-authperiod <1-4294967295>
no dot1x timeout re-authperiod
```

### Parameter

<1-4294967295> Specify the seconds between reauthorization attempts.

### Default

Default time is 3600 seconds

### Command Mode

Interface mode

### Example

```
#configure terminal
(config)#interface eth0
(config-if)#dot1x timeout re-authperiod 25
```

---

## dot1x timeout server-timeout

Use this command to set the authentication sever response timeout.

Use the `no` parameter to disable the authentication sever response timeout.

### Command Syntax

```
dot1x timeout server-timeout <1-65535>
no dot1x timeout server-timeout
```

### Parameter

<1-65535>            Specify the authentication server response timeout.

### Default

Default timeout is 30 seconds.

### Command Mode

Interface mode

### Examples

```
#configure terminal
(config)#interface eth0
(config-if)#dot1x timeout server-timeout 555

(config)#interface eth0
(config-if)#no dot1x timeout server-timeout
```

---

## dot1x timeout supp-timeout

Use this command to set the interval for a supplicant to respond.

Use the `no` parameter to disable the authentication server response timeout.

### Command Syntax

```
dot1x timeout supp-timeout <1-65535>
no dot1x timeout supp-timeout
```

### Parameter

`<1-65535>` Specify the authentication server response timeout.

### Default

Default timeout is 30 seconds.

### Command Mode

Interface mode

### Example

```
#configure terminal
(config)#interface eth0
(config-if)#dot1x timeout supp-timeout 40

(config)#interface eth0
(config-if)#no dot1x timeout supp-timeout
```

---

## dot1x timeout tx-period

Use this command to set the interval between successive attempts to request an ID.

Use the `no` parameter to disable the interval between successive attempts to request an ID.

### Command Syntax

```
dot1x timeout tx-period <1-65535>
no dot1x timeout tx-period
```

### Parameter

<1-65535>            Specify the authentication server response timeout.

### Default

Default timeout is 30 seconds.

### Command Mode

Interface mode

### Examples

```
#configure terminal
(config)#interface eth0
(config-if)#dot1x timeout tx-period 34

(config)#interface eth0
(config-if)#no dot1x timeout tx-period
```

---

## ip radius source-interface

Use this command to set the local address sent in packets to the radius server.

Use the `no` parameter to clear the local address.

### Command Syntax

```
ip radius source-interface HOSTNAME PORT
no ip radius source-interface
```

### Parameters

HOSTNAME	Specify the radius client in the dotted IP address, or in the hostname format.
PORT	Specify the radius client port number. The default port number is 1812.

### Command Mode

Configure mode

### Examples

```
#configure terminal
(config)#ip radius source-interface myhost 1812

(config)#no ip radius source-interface myhost
```

---

## radius-server deadtime

Use this command to specify the number of minutes a radius server, which is not responding to authentication requests, is passed over by requests for radius authentication. To improve radius response times when some servers might be unavailable, use this command to cause the unavailable servers to be skipped immediately.

Use the `no` form of this command to set deadtime to the default value of 0.

### Command Syntax

```
radius-server deadtime MIN
no radius-server deadtime
```

### Parameter

MIN	Length of time (in minutes) that a radius server is skipped over by transaction requests, up to a maximum of 1440 minutes (24 hours). Enter a value in the range 1 to 1440.
-----	---

### Default

Deadtime is set to 0

### Command Mode

Configure mode

### Examples

```
#configure terminal
(config)#radius-server deadtime 10

(config)#no radius-server deadtime
```

---

## radius-server host

Use this command to specify the IP address or host name of the remote radius server host and assign authentication and accounting destination port numbers. Multiple radius-server host commands can be used to specify multiple hosts. The software searches for hosts in the order they are specified. If no host-specific timeout, retransmit, or key values are specified, the global values apply to that host.

If the auth-port parameter is not specified, it will take the default value of the auth-port. If you do not specify the auth-port to unconfigure, and the default value of the auth-port does not match the port you are trying to unconfigure, the specified radius-server host will not be unconfigured.

Use the `no` form of the command to unconfigure a specified radius-server.

### Command Syntax

```
radius-server host HOSTNAME
radius-server host HOSTNAME {key STRING|retransmit RETRIES|timeout SEC|auth-port
    PORTNO}
no radius-server host HOSTNAME (auth-port PORT|)
```

### Parameters

<code>auth-port</code>	(Optional) Specify the UDP destination port for authentication requests; the host is not used for authentication if set to 0.
<code>key</code>	(Optional) Specify the authentication and encryption key for all radius communications between the router and the radius server. This key must match the encryption used on the radius daemon. All leading spaces are ignored, but spaces within and at the end of the string are used. If spaces are used in the string, do not enclose the string in quotation marks unless the quotation marks themselves are part of the key.
<code>retransmit</code>	(Optional) The number of times a radius request is re-sent to a server, if that server is not responding or responding slowly. This setting overrides the global setting of the radius-server retransmit command. Enter a value in the range 1 to 100. If no retransmit value is specified, the global value is used.
<code>timeout</code>	(Optional) The time interval (in seconds) that the router waits for the radius server to reply before retransmitting. This setting overrides the global value of the radius-server timeout command. If no timeout value is specified, the global value is used. Enter a value in the range 1 to 1000.

### Command Mode

Configure mode

### Examples

```
#configure terminal
(config)#radius-server host 10.10.10.40 auth-port 1812 timeout 5 retransmit 3
key authd

(config)#no radius-server host 10.10.10.40 auth-port 1812
```

---

## radius-server key

Use this command to set the shared secret key between a Radius server and a client.

Use the `no` form of the command to undo this configuration.

### Command Syntax

```
radius-server key KEY
no radius-server key
```

### Parameter

`KEY` Specify the secret key shared among the radius server and the 802.1x client.

### Command Mode

Configure mode

### Examples

```
#configure terminal
(config)#radius-server key ipi

#configure terminal
(config)#no radius-server key
```



---

## radius-server retransmit

Use this command to specify the number of times the router transmits each radius request to the server before giving up.

Use the `no` form of this command to disable retransmission.

### Command Syntax

```
radius-server retransmit RETRIES  
no radius-server retransmit
```

### Parameter

RETRIES	Specify the retransmit value. Enter a value in the range 1 to 100. If no retransmit value is specified, the global value is used.
---------	---

### Default

The default value is 3.

### Command Mode

Configure mode

### Examples

```
#configure terminal  
(config)#radius-server retransmit 12  
  
(config)#no radius-server retransmit
```

---

## radius-server timeout

Use this command to specify the number of seconds a router waits for a reply to a radius request before retransmitting the request.

Use the `no` parameter to use the default value.

### Command Syntax

```
radius-server timeout SEC
no radius-server timeout
```

### Parameter

SEC	The number of seconds for a router to wait for a server host to reply before timing out. Enter a value in the range 1 to 1000.
-----	---

### Default

The default value is 5 seconds.

### Command Mode

Configure mode

### Examples

```
#configure terminal
(config)#radius-server timeout 20

#configure terminal
(config)#no radius-server timeout
```

---

## show debugging dot1x

Use this command to display the status of the debugging of the 802.1x system.

### Command Syntax

```
show debugging dot1x
```

### Parameters

None

### Command Mode

Privileged Exec mode

### Example

```
#show debugging dot1x
802.1X debugging status:
```

# show dot1x

Use this command to display the state of the whole system.

## Command Syntax

```
show dot1x
show dot1x all
show dot1x diagnostics interface IFNAME
show dot1x interface IFNAME
show dot1x session statistics interface IFNAME
show dot1x statistics interface IFNAME
```

## Parameters

- all                    Display all information.
- diagnostics          Display diagnostics information.
- interface        Display diagnostics interface information.
- interface            Display interface information.
- sessionstatistics    Display session statistics.
- interface        Display session statistics interface information.
- statistics           Display statistics information.
- interface        Display statistics interface information.

## Command Mode

Exec mode and Privileged Exec mode

## Displayed Output

The following tables describes the output for the show dot1x all command and the show dot1x interface command.

Table 6-1: Port variables

Entry	Description
portEnabled	Interface operational status (Up-true/down-false)
portControl	Current control status of the port for 802.1x control
portStatus	802.1x status of the port (authorized/unauthorized)
reAuthenticate	Reauthentication enabled/disabled status on port
reAuthPeriod	Value holds meaning only if reAuthentication is enabled

**Table 6-2: Supplicant PAE related global variables**

Entry	Description
abort	Indicates that authentication should be aborted when set to true
fail	Indicates failed authentication attempt when set to false
start	Indicates authentication should be started when set to true
timeout	Indicates authentication attempt timed out when set to true
success	Indicates authentication successful when set to true

**Table 6-3: 802.1x Operational State of Interface**

Entry	Description
mode	Configured 802.1x mode
reAuthCount	Reauthentication count
quietperiod	Time between reauthentication attempts
reAuthMax	Maximum reauthentication attempts

**Table 6-4: Backend Authentication state machine variables and constants**

Entry	Description
state	State of the state machine
reqCount	Count of requests sent to server
suppTimeout	Supplicant timeout
serverTimeout	Server timeout
maxReq	Maximum requests to be sent

**Table 6-5: Controlled Directions State machine**

Entry	Description
adminControlledDirections	Administrative value (Both/In)
operControlledDirections	Operational Value (Both/In)

**Table 6-6: KR -- Key receive state machine**

Entry	Description
rxKey	True when EAPOL-Key message is received by supplicant or authenticator. false when key is transmitted

**Table 6-7: Key Transmit State machine**

Entry	Description
keyAvailable	False when key has been transmitted by authenticator, true when new key is available for key exchange
keyTxEnabled	Key transmission enabled/disabled status

### Example

The following is an output of this command displaying the state of the system.

```
#show dot1x
% 802.1x authentication enabled
% Radius server address: 192.168.1.1.1812
% Radius client address: dhcp128.ipinfusion.com.12103
% Next radius message id: 0
```

The following is an output of this command displaying detailed information for all ports.

```
#show dot1x all
% 802.1x authentication enabled
% Radius server address: 192.168.1.1.1812
% Radius client address: dhcp128.ipinfusion.com.12103
% Next radius message id: 0
% Dot1x info for interface eth1 - 3
% portEnabled: true - portControl: auto
% portStatus: unauthorized - currentId: 11
% reAuthenticate: disabled
% abort:F fail:F start:F timeout:F success:F
% PAE: state: connecting - portMode: auto
% PAE: reAuthCount: 2 - rxRespId: 0
% PAE: quietPeriod: 60 - reauthMax: 2 - txPeriod: 30
% BE: state: idle - reqCount: 0 - idFromServer: 0
% BE: suppTimeout: 30 - serverTimeout: 30 - maxReq: 2
% CD: adminControlledDirections: in - operControlledDirections: in
% CD: bridgeDetected: false
% KR: rxKey: false
% KT: keyAvailable: false - keyTxEnabled: false
```

---

## snmp restart auth

Use this command to restart SNMP in Authentication

### Command Syntax

```
snmp restart auth
```

### Parameters

None

### Command Mode

Configure mode

### Examples

```
#snmp restart auth
```





## CHAPTER 7    Link Aggregation Control Protocol Commands

---

This chapter describes Link Aggregation Control Protocol (LACP) commands.

- [channel-group mode](#) on page 178
- [clear lacp](#) on page 179
- [debug lacp](#) on page 180
- [lacp destination-mac](#) on page 181
- [lacp discard wrong conversation](#) on page 182
- [lacp port-priority](#) on page 183
- [lacp system-priority](#) on page 184
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- [port-channel load-balance](#) on page 186
- [show debugging lacp](#) on page 187
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- [show lacp-counter](#) on page 190
- [show port etherchannel](#) on page 191
- [snmp restart lacp](#) on page 192
- [static-channel-group](#) on page 193

---

## channel-group mode

Use this command to create a link aggregation group or to add an interface to an link aggregation group.

Use the `no` parameter with this command to remove an interface from a link aggregation group.

### Command Syntax

```
channel-group <1-65535> mode (active|passive)
channel-group <1-16383> mode (active|passive)
no channel-group
```

### Parameters

<1-65535>	Specify a channel group number (without DRNI).
<1-16383>	Specify a channel group number (with DRNI).
mode	Specify a channel mode.
active	Enable LACP negotiation.
passive	Disable LACP negotiation.

### Command Mode

Interface mode

### Examples

```
#configure terminal
(config)#interface eth0
(config-if)#channel-group 4 mode active

#configure terminal
(config)#interface eht0
(config-if)#no channel-group
```

---

## clear lacp

Use this command to clear the counters of all LACP aggregators or a given LACP aggregator.

### Command Syntax

```
clear lacp <1-65535> counters
clear lacp counters
```

### Parameters

<1-65535>            Clears a channel-group number.

### Command Mode

Exec mode and Privileged Exec mode

### Example

```
#clear lacp 2 counters
```

---

## debug lacp

Use this command to enable LACP debugging.

Use the `no` parameter with this command to disable debugging.

### Command Syntax

```
debug lacp (event|cli|timer|packet|sync|ha|csfcd|all)
debug lacp timer detail
no debug lacp (event|cli|timer|packet|sync|ha|csfcd|all)
no debug lacp timer detail
undebug all
```

### Parameters

<code>all</code>	Enables all LACP debugging.
<code>cli</code>	Echo commands to console.
<code>event</code>	Sets the debug options for LACP events.
<code>ha</code>	Echo High availability events to console.
<code>packet</code>	Sets the debug option for LACP packets.
<code>csfcd</code>	Conversation-sensitive frame collection and distribution
<code>sync</code>	Echo synchronization to console.
<code>timer</code>	Echo timer expiry to console.
<code>timer detail</code>	Echo timer start/stop to console.

### Command Mode

Exec mode and Privileged Exec mode

### Example

```
#debug lacp all
```

---

## lacp destination-mac

Use this command to set the address type to use for sending LACPDU (Link Aggregation Control Protocol Data Units).

Note: The interface must be an aggregation port.

Use the `no` form of this command to set the address type to its default (multicast group address).

### Command Syntax

```
lacp destination-mac (customer-bridge-group-address | multicast-group-address |  
non-tmpr-group-address)  
no lacp destination-mac
```

### Parameters

customer-bridge-group-address	Customer bridge group address
multicast-group-address	Multicast group address (default)
non-TPMR-group-address	Non-Two-Port Media Access Control Relay (TPMR) group address

### Command Mode

Interface mode

### Example

```
#config terminal  
(config)#interface eth1  
(config-if)#lacp destination-mac customer-bridge-group-address
```

---

## lacp discard wrong conversation

Use this command to enable or disable discarding frames with an incorrect port conversation identifier.

Note: The interface must be a dynamic port-channel.

### Command Syntax

```
lacp discard wrong conversation (disable|enable)
```

### Parameters

disable	Do not discard frames with an incorrect port conversation identifier
enable	Discard frames with an incorrect port conversation identifier

### Command Mode

Interface mode

### Example

```
#config terminal
(config)#interface po1
(config-if)#lacp discard wrong conversation enable
```

---

## lacp port-priority

Use this command to set the priority of a channel. Channels are selected for aggregation based on their priority with the higher priority (numerically lower) channels selected first.

Use the `no` parameter with this command to set the priority of port to the default value (32768).

### Command Syntax

```
lacp port-priority <1-65535>
no lacp port-priority
```

### Parameters

`<1-65535>` Specify the LACP port priority.

### Command Mode

Interface mode

### Example

```
#configure terminal
(config)#interface eth0
(config-if)#lacp port-priority 34
```

---

## lacp system-priority

Use this command to set the LACP system priority. This priority determines the system responsible for resolving conflicts in the choice of aggregation groups.

**Note:** A lower numerical value has a higher priority.

Use the `no` parameter with this command to set the system priority to its default value (32768).

### Command Syntax

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

### Parameters

<1-65535>            System priority.

### Default

Default system priority is 32768

### Command Mode

Configure mode

### Example

```
#configure terminal
(config)#lacp system-priority 6700
```



---

## lacp timeout

Use this command to set either a short or long timeout value on a port. The timeout value is the number of seconds before invalidating a received LACP data unit (DU).

### Command Syntax

```
lacp timeout (short|long)
```

### Parameters

short	LACP short timeout. 3 seconds.
long	LACP long timeout. 90 seconds.

### Default

Default is long.

### Command Mode

Interface mode

### Example

The following sets the LACP short timeout on a port.

```
#configure terminal
(config)#interface eth0
(config-if)#lacp timeout short
```

---

## port-channel load-balance

Use this command to configure LACP port-channel load-balancing and set port-selection criteria (PSC) for an interface.

Use the `no` option with this command to remove the load-balancing configuration and unset PSC.

### Command Syntax

```
port-channel load-balance (dst-mac|src-mac|src-dst-mac|dst-ip|src-ip|src-dst-  
ip|dst-port|src-port|src-dst-port)  
no port-channel load-balance
```

### Parameters

<code>dst-ip</code>	Destination IP address-based load balancing.
<code>dst-mac</code>	Destination MAC address-based load balancing.
<code>dst-port</code>	Destination TCP/UDP address-based load balancing.
<code>src-dst-ip</code>	Source and Destination IP address-based load balancing.
<code>src-dst-mac</code>	Source and Destination MAC address-based load balancing.
<code>src-dst-port</code>	Source and Destination TCP/UDP address-based load balancing.
<code>src-ip</code>	Source IP address-based load balancing.
<code>src-mac</code>	Source MAC address-based load balancing.
<code>src-port</code>	Source port address-based load balancing.

### Command Mode

Interface mode

### Example

```
#configure terminal  
(config)#interface po1  
(config-if)#port-channel load-balance src-dst-mac
```

---

## show debugging lacp

Use this command to display the status of the debugging of the LACP system.

### Command Syntax

```
show debugging lacp
```

### Parameters

None

### Command Mode

Exec and Privileged Exec mode

### Example

```
#show debugging lacp
```

```
LACP debugging status:  
LACP timer debugging is on
```

## show etherchannel

Use this command to display information about link aggregation groups.

### Command Syntax

```
show etherchannel
show etherchannel <1-65535>
show etherchannel detail
show etherchannel load-balance
show etherchannel summary
```

### Parameters

<1-65535>	Specify channel-group number.
detail	Specify detailed etherchannel information.
load-balance	Specify load balancing.
summary	Specify Etherchannel summary information.

### Command Mode

Exec mode and Privileged Exec mode

### Example

```
#show etherchannel detail
% Aggregator po1 1000003
% Mac address: 00:a0:bd:69:00:05
% Admin Key: 0001 - Oper Key 0001
% Receive link count: 1 - Transmit link count: 0
% Individual: 0 - Ready: 1
% Partner LAG- 0x8000,00-6a-3e-e7-00-03
%   Link: fe3 (5003) sync: 1
%   Link: fe4 (5004) sync: 1
#
#sho etherchannel 1
% Aggregator po1 1000000 Admin Key: 0001 - Oper Key 0001
% Actor Port Algorithm: C-VID
% Actor Conversation Port List Digest:
2173768136250198249822101416821915274960
Port Conversation      Port-priority    Port-number  Priority
1                      32768          10           1
1                      32768          11           2
% Partner LAG: 0x8000,52-54-00-8b-fc-96,0x0001
% Partner Oper Key 0001
% Partner Oper Port Algorithm: C-VID
% Partner Oper Conversation Port List Digest:
1661292271456220997132195238187805222982193
% Partner Admin Conversation Port List Digest: 0000000000000000
% Differ Port Algorithm: FALSE
% Differ Port Conversation ID Digest: TRUE
```

---

## show lacp sys-id

Use this command to display the LACP system identifier and priority.

### Command Syntax

```
show lacp sys-id
```

### Parameters

sys-id	Display LACP system ID and priority
--------	-------------------------------------

### Command Mode

Exec and Privileged Exec mode

### Example

```
#show lacp sys-id
% System 8000,00-0e-0c-83-37-27
```

---

## show lacp-counter

Use this command to display the packet traffic on all ports of all present LACP aggregators, or a given LACP aggregator.

### Command Syntax

```
show lacp-counte
show lacp-counter <1-65535>
```

### Parameters

<1-65535>            Channel-group number

### Command Mode

Exec and Privileged Exec mode

### Example

```
#show lacp-counter 555
```

Port	LACPDUs		Marker		Pckt err	
	Sent	Recv	Sent	Recv	Sent	Recv

---

## show port etherchannel

Use this command to display details about an LACP interface.

### Command Syntax

```
show port etherchannel IFNAME
```

### Parameters

IFNAME	Interface name
--------	----------------

### Command Mode

Exec and Privileged Exec mode

### Example

```
# show port etherchannel eth1

% LACP link info: eth1 - 4
% LAG ID: 0x8000,52-54-00-8d-bb-0b,0x0002
% Partner oper LAG ID: 0x0000,00-00-00-00-00-00,0x0000
% Actor priority: 0x8000 (32768)
% Admin key: 0x0002 (2) Oper key: 0x0002 (2)
% Physical admin key:(4)
% Receive machine state : Defaulted
% Periodic Transmission machine state : Slow periodic
% Mux machine state : Attached
% Oper state: ACT:1 TIM:0 AGG:1 SYN:1 COL:0 DIS:0 DEF:1 EXP:0
% Destination Mac: Customer-bridge-group-address [01-80-c2-00-00-00]
% Actor version: 2
% ActPar Sync: 1
% Long LACPDU Transmit: FALSE
% Partner oper state: ACT:0 TIM:0 AGG:1 SYN:0 COL:0 DIS:0 DEF:1 EXP:0
% Partner link info: admin port 0
% Partner oper port: 0
% Partner admin LAG ID: 0x0000-00:00:00:00:0000
% Admin state: ACT:1 TIM:0 AGG:1 SYN:0 COL:0 DIS:0 DEF:1 EXP:0
% Partner admin state: ACT:0 TIM:0 AGG:1 SYN:0 COL:0 DIS:0 DEF:1 EXP:0
% Partner version: 2
% Partner ActPar Sync:0
% Partner system priority - admin:0x0000 - oper:0x0000
% Partner port priority - admin:0x0000 - oper:0x0000
% Aggregator ID: 1000001
```

---

## snmp restart lacp

Use this command to restart SNMP in LACP.

### Command Syntax

```
snmp restart lacp
```

### Parameters

None

### Command Mode

Configure mode

### Examples

```
(config)#snmp restart lacp
```



---

## static-channel-group

Use this command to create a static link aggregation group or to add an interface to an existing link aggregation group.

Use the `no` parameter with this command to remove an interface from a static link aggregation group.

### Command Syntax

```
static-channel-group <1-12>
no static-channel-group
```

### Parameter

`<1-12>` Specify a channel group number.

### Command Mode

Interface mode

### Example

```
#configure terminal
(config)#interface eth0
(config-if)#static-channel-group 2
```



## CHAPTER 8 Multi-Chassis Link Aggregation Commands

---

This chapter describes the Multi-Chassis Link Aggregation commands.

Multi-Chassis Link Aggregation is also called MC-LAG, MLAG, or Distributed Resilient Network Interconnect (DRNI). In this document, it is called MC-LAG.

Note: MLAG is not supported for ZebIC releases.

- [clear drcpdu-statistics](#) on page 196
- [conversation alloc-mode](#) on page 197
- [debug drni](#) on page 198
- [gateway-conv-id](#) on page 199
- [intra-portal destination-address-type](#) on page 200
- [intra-portal-link](#) on page 201
- [mlag](#) on page 202
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- [portal-address](#) on page 204
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- [portal-system-number](#) on page 207
- [portal-topology](#) on page 208
- [port-conv-id](#) on page 209
- [show drcpdu statistics](#) on page 210
- [show mlag conversation-id](#) on page 211
- [show mlag detail](#) on page 212
- [show mlag summary](#) on page 213

---

## clear drcpdu-statistics

Use this command to clear DRCPDU (Distributed Relay Control Protocol Data Unit) statistics for the portal system.

### Command Syntax

```
clear drcpdu-statistics
```

### Parameters

None

### Command Mode

Privileged Exec mode

### Examples

```
#clear drcpdu-statistics
```

---

## conversation alloc-mode

Use this command to set the conversation identifier allocation mode.

### Command Syntax

```
conversation alloc-mode (manual | auto)
```

### Parameters

manual	Manual allocation mode
auto	Automatic allocation mode

### Command Mode

MLAG mode

### Example

```
#config terminal
(config)#mlog configuration 1
(config-mlog)#conversation alloc-mode auto
```

---

## debug drni

Use this command to log debug messages about MC-LAG.

Use the `undebug` form of this command to turn off debugging.

### Command Syntax

```
debug drni (rx | tx | timer | event | cli | all )
undebug drni (rx | tx | timer | event | cli | all )
```

### Parameters

<code>rx</code>	Receive messages
<code>tx</code>	Transmit messages
<code>timer</code>	Timer messages
<code>event</code>	Event messages
<code>cli</code>	Command messages
<code>all</code>	All messages

### Command Mode

Privileged Exec mode

### Examples

```
#debug drni all
```

---

## gateway-conv-id

Use this command to manually allocate a range of gateway conversation identifiers. This range of gateway conversation identifiers is distributed through the configured portal system.

Use the `no` form of this command to remove the gateway conversation identifier allocation.

### Command Syntax

```
gateway-conv-id <1-4096> (<1-4096>|) [portal-system <1-3> priority <1-3>]  
no gateway-conv-id <1-4096> (<1-4096>|) [portal-system <1-3> priority <1-3>]
```

### Parameters

<1-4096>	Starting gateway conversation identifier
<1-4096>	Ending gateway conversation identifier
portal-system	Portal system
<1-3>	Portal system number
priority	Portal system priority
<1-3>	Portal system priority

### Command Mode

MLAG mode

### Example

```
#config terminal  
(config)#mlag configuration 1  
(config-mlag)#gateway-conv-id 1 100 portal-system 1 priority 1
```

---

## intra-portal destination-address-type

Use this command to set the address type to use for sending DRCPDUs (Distributed Relay Control Protocol Data Units) on an intra-portal port (IPP).

Use the `no` form of this command to set the address type to its default (non-TPMR group address).

### Command Syntax

```
intra-portal destination-address-type ( customer-bridge-group-address | multicast-  
group-address | non-TPMR-group-address )  
no intra-portal destination-address-type
```

### Parameters

<code>customer-bridge-group-address</code>	Customer bridge group address
<code>multicast-group-address</code>	Multicast group address
<code>non-TPMR-group-address</code>	Non-Two-Port Media Access Control Relay (TPMR) group address (default)

### Command Mode

MLAG mode

### Example

```
#config terminal  
(config)#mlag configuration 1  
(config-mlag)#intra-portal customer-bridge-group-address
```



---

## intra-portal-link

Use this command to:

- Create an intra-portal link (IPL) that connects two portal systems
- Change the timeout of existing IPL

Use the `no` form of this command to remove an intra-portal link.

### Command Syntax

```
intra-portal-link IFNAME (neighbor-portal-system <1-3> | periodic-time (fast|slow))
no intra-portal-link IFNAME
```

### Parameters

IFNAME	Interface name
neighbor-portal-system	
	Neighbor portal system
<1-3>	Portal system number
periodic-time	Timeout for DRCPDU (Distributed Relay Control Protocol Data Unit) exchange:
fast	One second between periodic transmissions
slow	Thirty seconds between periodic transmissions

### Command Mode

MLAG mode

### Example

```
#config terminal
(config)#mlag configuration 1
(config-mlag)#intra-portal-link eth1 neighbor-portal-system 2
```

---

## m lag

Use this command to assign an MC-LAG identifier to an interface. Only one interface can be bound to an MC-LAG instance.

**Note:** The interface must be a dynamic port channel.

Use the `no` form of this command to unassign an MC-LAG identifier from an interface.

### Command Syntax

```
m lag <1-65535>
no m lag
```

### Parameters

<1-65535>	MC-LAG identifier
-----------	-------------------

### Command Mode

Interface mode

### Example

```
#config terminal
(config)#interface po1
(config-if)#m lag 1
```

---

## m lag configuration

Use this command to enter MC-LAG configuration mode to set multi-chassis link aggregation features.

Use the `no` form of this command to remove all multi-chassis link aggregation configuration except for port channel to MC-LAG mapping.

### Command Syntax

```
m lag configuration <1-65535>
no m lag configuration <1-65535>
```

### Parameters

<1-65535>	MC-LAG identifier
-----------	-------------------

### Command Mode

Configure mode

### Examples

```
#configure terminal
(config)#m lag configuration 245
(config-m lag)#
```

---

## portal-address

Use this command to set the MAC address of the portal system.

### Command Syntax

```
portal-address MAC
```

### Parameters

MAC	MAC address in <code>HHHH.HHHH.HHHH</code> format; the values <code>0000.0000.0000</code> and <code>FFFF.FFFF.FFFF</code> are not valid
-----	---

### Command Mode

MLAG mode

### Example

```
#config terminal
(config)#mlog configuration 1
(config-mlog)#portal-address 5254.0059.424f
```

---

## portal-name

Use this command to set the name of the portal.

Use the `no` form of this command to remove the portal name.

### Command Syntax

```
portal-name WORD
no portal-name
```

### Parameters

WORD	Portal name; maximum 15 characters
------	------------------------------------

### Command Mode

MLAG mode

### Example

```
#config terminal
(config)#mlog configuration 1
(config-mlog)#portal-name ipi-mlog-1
```

---

## portal-priority

Use this command to set the portal priority.

Use the `no` form of this command to remove the portal priority.

### Command Syntax

```
portal-priority <1-65535>
no port-channel load-balance
```

### Parameters

<1-65535>	Portal priority
-----------	-----------------

### Command Mode

MLAG mode

### Example

```
#config terminal
(config)#mlog configuration 1
(config-mlog)#portal-priority 1
```

---

## portal-system-number

Use this command to set the portal system number that uniquely identifies the system in the portal.

### Command Syntax

```
portal-system-number <1-3>
```

### Parameters

<1-3>	Portal system number
-------	----------------------

### Command Mode

MLAG mode

### Example

```
#config terminal
(config)#mlog configuration 1
(config-mlog)#portal-system-number 1
```

---

## portal-topology

Use this command to set the portal topology.

### Command Syntax

```
portal-topology (2-portal | 3-portal)
```

### Parameters

2-portal	Two-node topology
3-portal	Three-node topology

### Command Mode

MLAG mode

### Example

```
#config terminal
(config)#mlag configuration 1
(config-mlag)#portal-topology 2-portal
```



## port-conv-id

Use this command to manually allocate a range of port conversation identifiers to an aggregation port. This range of conversation identifiers is distributed through the aggregation port.

Perform this configuration on a port-channel interface.

Use the `no` form of this command to remove the port conversation identifier allocation.

### Command Syntax

```
port-conv-id <1-4096> (<1-4096>|) [port-priority <1-65535> port-number <1-65535>
portal-system <0-3> priority <1-4>]
no port-conv-id <1-4096> (<1-4096>|) [port-priority <1-65535> port-number <1-
65535> portal-system <0-3> priority <1-4>]
```

### Parameters

<1-4096>	Starting port conversation identifier
<1-4096>	Ending port conversation identifier
port-priority	Port priority
<1-65535>	Port priority
port-number	Port number
<1-65535>	Port number
portal-system	Portal system. When you set this value to 0, then only LACPv2 can use the port conversation identifier configuration. Specify 0 when LACPv2 alone is used at the end node. If this value is between 1-3, then the configuration can be used between both LACPv2 and DRNI.
<0-3>	Portal system number
priority	Portal system priority
<1-4>	Portal system priority

### Command Mode

Interface mode

### Example

```
(config)#int po1
(config-if)#port-conv-id 1 10 port-priority 32768 port-number 10 portal-system
0 priority 1 port-priority 32768 port-number 11 portal-system 0 priority 2
(config-if)#port-conv-id 15 18 port-priority 32768 port-number 11 portal-
system 0 priority 1 port-priority 32768 port-number 10 portal-system 0
priority 2
(config-if)#end
#sho etherchannel 1 port-conversation-id
% eth8
% Conversation ID : 1-10
% eth9
% Conversation ID : 15-18
```

---

## show drcpdu statistics

Use this command to display DRCPDU (Distributed Relay Control Protocol Data Unit) statistics.

### Command Syntax

```
show drcpdu statistics
```

### Parameters

None

### Command Mode

Privileged Exec mode

### Examples

```
#show drcpdu statistics
```

```
Unknown DRCPDU frames received on portal : 5
```

```
Intra Portal Interface   eth1
Number of valid DRCPDU Received   : 10
Number of invalid DRCPDU Received : 0
Number of DRCPDU Transmitted      : 10
```

---

## show mlag conversation-id

Use this command to display MC-LAG gateway or port conversation identifiers.

### Command Syntax

```
show mlag <1-65535> (gateway-conversation-id | port-conversation-id)
```

### Parameter

<1-65535>            MLAG identifier

gateway-conversation-id            Gateway conversation identifiers

port-conversation-id            Port conversation identifiers

### Command Mode

Privileged Exec mode

### Example

```
#show mlag 1 gateway-conversation-id
```

Gateway Conversation	Portal-System	Priority
1-100	1	1
1-100	2	2
1-100	3	3

```
#show mlag 1 port-conversation-id
```

Port Conversation	Port-priority	Port-number	Portal-System	Priority
1-100	1	5010	1	1
1-100	2	5051	2	2
1-100	3	5063	3	3

---

## show mlag detail

Use this command to display details about MC-LAG configuration and status.

### Command Syntax

```
show mlag <1-65535> detail
```

### Parameters

<1-65535>            MLAG identifier

### Command Mode

Privileged Exec mode

### Examples

```
#show mlag 1 detail
Portal-System-Number : 1
Portal-Address       : 5254.00dd.c9e6
Portal-Priority      : 1
Mapped Aggregator   : None
Gateway-Algorithm    : C-VID
Port-Algorithm       : C-VID
Gateway-Digest       :
Port-Digest          :
Dest Mac address     : customer-bridge-group-address

Topology             : 2-portal
Conv Alloc Mode      : Automatic

Portal State Machine State
  Portal System State : Portal System Update
  Gateway State       : Gateway Update
  Port State          : DRNI Port Update

Gateway Conversation  Portal-System Priority
1-100                1                  1
1-100                2                  2
1-100                3                  3

Port Conversation     Port-priority  Port-number  Portal-System Priority
1-100                1                5010        1                1
1-100                2                5051        2                2
1-100                3                5063        3                3
```

---

## show mlag summary

Use this command to display MC-LAG configuration and status.

### Command Syntax

```
show mlag (<1-65535>|) summary
```

### Parameters

<1-65535>            MLAG identifier

### Command Mode

Privileged Exec mode

### Examples

```
#show mlag 1 summary
MLAG Configuration :
MLAG-ID           : 1
-----
Portal-System-Number : 1
Portal-Address      : 5254.00dd.c9e6
Portal-Priority     : 1
Mapped Aggregator   : None
Gateway-Algorithm    : C-VID
Port-Algorithm       : C-VID
Gateway-Digest       :
Port-Digest          :
Dest Mac address     : customer-bridge-group-address

Topology            : 2-portal
Conv Alloc Mode      : Automatic
Intra Portal Interfaces : eth2
```



## CHAPTER 9 GMRP Commands

---

This chapter contains the commands to configure specific VLANs or all VLANs on bridges or switches using the GARP Multicast Registration Protocol. GMRP supports a mechanism to enable bridges and end stations to dynamically register group membership information with the MAC bridges attached to the same LAN segment, and for that information to be disseminated across all bridges in the Bridged LAN that supports extended filtering services. The operation of GMRP relies upon the services provided by the GARP (Generic Attribute Registration Protocol).

This chapter provides a description, syntax, and examples of the GMRP commands. It includes the following commands:

- [clear gmrp](#) on page 208
- [debug gmrp](#) on page 209
- [set gmrp disable](#) on page 210
- [set gmrp enable](#) on page 211
- [set gmrp extended-filtering](#) on page 212
- [set gmrp fwdall](#) on page 213
- [set gmrp registration](#) on page 214
- [set gmrp timer](#) on page 215
- [set port gmrp](#) on page 216
- [show debugging gmrp](#) on page 217
- [show gmrp configuration](#) on page 218
- [show gmrp machine](#) on page 219
- [show gmrp statistics](#) on page 220
- [show gmrp timer](#) on page 221

---

## clear gmrp

Use this command to clear GMRP statistics for a given VLAN or all the VLANs configured on the switch.

### Command Syntax

```
clear gmrp statistics all
clear gmrp statistics all bridge BRIDGE_NAME
clear gmrp statistics vlanid <1-4094>
clear gmrp statistics vlanid <1-4094> bridge <1-32>
```

### Parameters

all	Clears all identifiers.
BRIDGE_NAME	Bridge identifier.
<1-4094>	Clears VLAN identifiers.
<1-32>	Specify a bridge identifier.

### Default

This default clearing is for all the configured VLANs.

### Command Mode

Exec mode and Privileged Exec mode

### Examples

This example shows how to clear the GMRP statistics for a given VLAN 12.

```
#clear gmrp statistics vlan 12 bridge 2
```

This example shows to clear the GMRP statistics for all the configured VLANs on a bridge.

```
#clear gmrp statistics all bridge 2
```



## debug gmrp

Use this command to display various types of data on the console. Use the `all` parameter to display all types of debugging information on the console, or use any combination of the other parameters to display desired data on the console.

Use the `no` parameter to turn off a specific type of debugging.

### Command Syntax

```
debug gmrp all
debug gmrp cli
debug gmrp event
debug gmrp packet
debug gmrp timer
no debug gmrp all
no debug gmrp event
no debug gmrp cli
no debug gmrp timer
no debug gmrp packet
```

### Parameters

<code>all</code>	Use this parameter to echo all of the above data types to the console.
<code>cli</code>	Use this parameter to echo commands to the console.
<code>event</code>	Use this parameter to echo events to the console.
<code>packet</code>	Use this parameter to echo packet contents to the console.
<code>timer</code>	Use this parameter to echo the time start to the console.

### Default

Default clearing is for all the configured VLANs.

### Command Mode

Configure mode

### Example

This example shows set debugging for commands and packets:

```
#configure terminal
(config)#debug gmrp cli
```

---

## set gmrp disable

Use this command to disable GMRP globally on a switch for the default bridge. This command does not disable GMRP in all ports of the bridge.

### Command Syntax

```
set gmrp disable bridge BRIDGE_NAME
set gmrp disable bridge BRIDGE_NAME vlan VLANID
```

### Parameters

BRIDGE_NAME	Bridge identifier.
VLANID	VLAN identifier <1-4094>.

### Default

GMRP is disabled by default

### Command Mode

Configure mode

### Example

```
#configure terminal
(config)#set gmrp disable bridge 2 vlan 2
```

---

## set gmrp enable

Use this command to enable GMRP globally on a switch for the default bridge. This command does not enable GMRP for all ports of the bridge. After enabling GMRP globally, use the `set port gmrp` command to enable GMRP on individual ports of the bridge (see [set port gmrp](#) on page 216).

GMRP cannot be enabled if IGMP Snooping is enabled or if GMRP has already been configured for a particular VLAN.

### Command Syntax

```
set gmrp enable bridge BRIDGE_NAME
set gmrp enable bridge BRIDGE_NAME vlan VLANID
```

### Parameters

BRIDGE_NAME	Bridge identifier.
VLANID	VLAN identifier <1-4094>.

### Default

GMRP is disabled by default

### Command Mode

Configure mode

### Example

To enable GMRP on a switch for bridge 2:

```
#configure terminal
(config)#set gmrp enable bridge 2
GMRP is enabled for bridge 2
```

To enable GMRP on a switch on bridge 3 when IGMP Snooping is enabled:

```
#configure terminal
(config)#set gmrp enable bridge 3
```

Note: First disable IGMP Snooping, then enable GMRP on bridge 3.

To enable GMRP on a switch for a bridge 2 and VLAN 2:

```
#configure terminal
(config)#set gmrp enable bridge 2 vlan 2
```

---

## set gmrp extended-filtering

Use this command to enable or disable extended filtering on a bridge as per Table 8-7 of IEEE802.1Q-2003.

### Command Syntax

```
set gmrp extended-filtering enable bridge BRIDGE_NAME
set gmrp extended-filtering disable bridge BRIDGE_NAME
```

### Parameters

enable	Enables GMRP on a switch.
disable	Disables GMRP on a switch.
BRIDGE_NAME	Bridge identifier.

### Default

Extended filtering is disabled on a GMRP-enabled bridge.

### Command Mode

Configure mode

### Examples

Enable extended filtering services:

```
#configure terminal
(config)#set gmrp extended-filtering enable bridge 1
```

Disable extended filtering services on bridge 1:

```
#configure terminal
(config)#set gmrp extended-filtering disable bridge 1
```

---

## set gmrp fwdall

Use this command to set the GMRP `forward all` option for an interface.

### Command Syntax

```
set gmrp fwdall disable IF_NAME
set gmrp fwdall enable IF_NAME
```

### Parameters

<code>disable</code>	Disables GMRP on a switch.
<code>enable</code>	Enables GMRP on a switch.
<code>IF_NAME</code>	The identity of the interface

### Default

If this command is not used, the default setting is GMRP disabled.

### Command Mode

Configure mode

### Example

To enable GMRP forwarding on a switch for a particular interface :

```
#configure terminal
(config)#set gmrp fwdall enable eth1
```

---

## set gmrp registration

Use this command to set GMRP registration type.

To de-register a multicast port, the port must be in the `normal` registration mode.

### Command Syntax

```
set gmrp registration fixed IF_NAME
set gmrp registration forbidden IF_NAME
set gmrp registration normal IF_NAME
set gmrp registration restricted IF_NAME
```

### Parameters

<code>fixed</code>	Determine that the multicast groups currently registered on the switch are applied to the port, but that subsequent registrations or de-registrations do not affect the port. This means that none of the registered multicast groups on the port are to be de-registered based on GARP timers.
<code>forbidden</code>	Indicates that all GMRP multicasts are de-registered, and prevents further GMRP multicast registration on the port.
<code>normal</code>	Set dynamic GMRP multicast registration and de-registration on the port.
<code>restricted</code>	Defines a restricted registration.
<code>IF_NAME</code>	Defines a text string used as the name of the interface in ASCII format. Valid number of characters is between 1 and 16.

### Default

The default is normal registration for all the ports

### Command Mode

Configure mode

### Example

This example shows how to set the port to normal registration:

```
#configure terminal
(config)#set gmrp registration normal eth0 bridge 2
GMRP Registration is set to normal for eth0
```

---

## set gmrp timer

Use this command to set the values for the GMRP Join, Leave, and Leaveall timers for a specified bridge. The relationship for the timer values are as follows:

- Leave timer must be greater than, or equal to, three times the join timer.
- Leaveall timer must be greater than the leave timer.

### Command Syntax

```
set gmrp timer join TIMER_VALUE IF_NAME
set gmrp timer leave TIMER_VALUE IF_NAME
set gmrp timer leaveall TIMER_VALUE IF_NAME
```

### Parameters

join	Specify the timer for joining the group.
leave	Specify the timer for leaving a group.
leaveall	Specify the timer for leaving all groups.
TIMER_VALUE	Specify the timer value in hundredths of a second.
IF_NAME	Specify the name of the interface.

### Default

Default for the join timer is 200 milliseconds (ms).

Default for the leave timer is 600 milliseconds.

Default for the leaveall timer is 10000 ms.

### Command Mode

Configure mode

### Example

This example shows how to set the join timers for all ports and all VLANs.

```
#configure terminal
(config)#set gmrp timer join 100 eth0
GARP Join timer value is set to 100 centiseconds
```

---

## set port gmrp

Use this command to enable or disable GMRP on a particular port in all VLANs or all ports in a bridge.

GMRP on a port cannot be enabled for all VLANs if GMRP has already been configured for a particular VLAN for the port.

### Command Syntax

```
set port gmrp disable (IF_NAME|all)
set port gmrp enable (IF_NAME|all)
set port gmrp disable IF_NAME vlan VLANID
set port gmrp enable IF_NAME vlan VLANID
```

### Parameters

enable	Enables GMRP on a switch.
disable	Disables GMRP on a switch.
all	All ports added to recently configured bridge.
IFNAME	Specify the name of the interface.
VLANID	VLAN identifier <1-4094>.

### Default

GMRP is disabled by default.

### Command Mode

Configure mode

### Examples

This example shows how to enable GMRP on a particular port in all VLANs on a specified bridge.

```
#configure terminal
(config)#set port gmrp enable eth0
GMRP enabled on port eth0

#configure terminal
(config)#set port gmrp enable all
GMRP enabled on all ports added to recently configured bridge
```

This example shows how to enable GMRP on a specified port (eth0) in VLAN 2.

```
#configure terminal
(config)#set port gmrp enable eth0 vlan 2
GMRP enabled on port eth0 and vlan 2
```



---

## show debugging gmrp

Use this command to display the status of the debugging of the GMRP system.

To modify the lines displayed, use the | (output modifier token). To save the output to a file, use the > (output redirection token).

### Command Syntax

```
show debugging gmrp
```

### Parameters

None

### Command Mode

Exec and Privileged Exec mode

### Examples

```
#show debugging gmrp
GMRP debugging status:
  GMRP Timer debugging is on
```

---

## show gmrp configuration

Use this command to display GMRP related configuration information for the default bridge.

### Command Syntax

```
show gmrp configuration bridge BRIDGE_NAME
```

### Parameter

BRIDGE\_NAME      Bridge identifier.

### Command Mode

Exec and Privileged Exec mode

### Examples

The following is an output of this command displaying GMRP related configuration information for a bridge:

```
#show gmrp configuration bridge 2
Global GMRP Configuration for bridge:2
GMRP Feature: Enabled

GMRP Timers (centiseconds):
Join:          20
Leave:          60
Leave All:      1000

Port based GMRP Configuration:
GMRP Status    Registration    Forward All    Port
-----
Enabled        Normal          Disabled       eth4
Enabled        Normal          Disabled       eth5
```

---

## show gmrp machine

Use this command to display the state machine for GMRP, for the default bridge.

### Command Syntax

```
show gmrp machine bridge BRIDGE_NAME
```

### Parameter

BRIDGE\_NAME      Bridge identifier.

### Command Mode

Exec and Privileged Exec mode

### Examples

The following is an output of this command displaying the GMRP state machine for bridge 2.

```
#show gmrp machine bridge 2
port = eth0      VLAN = 1      applicant state[0] = VO registrar state[0] = MT
                               applicant state[1] = VO registrar state[1] = MT
port = eth1      VLAN = 1      applicant state[0] = VO registrar state[0] = MT
                               applicant state[1] = VO registrar state[1] = MT
```

---

## show gmrp statistics

To display the GMRP related statistics.

To modify the lines displayed, use the | (output modifier token) and to save the output to a file, use the > (output redirection token).

### Command Syntax

```
show gmrp statistics vlanid <1-4094> (bridge <1-32>|)
```

### Parameters

<1-4094>	Displays the VLAN identifier.
<1-32>	Display bridge instance.

### Command Mode

Exec and Privileged Exec mode

### Example

The following is an output of this command displaying GMRP statistics.

```
#show gmrp statistics vlan 555
GMRP Statistics for bridge b vlan 1
```

```
-----
Total GMRP packets Received:      0
Join Empties:                     0
Join Ins:                         0
Leave Empties:                     0
Leave Ins:                         0
Empties:                          0
```

```
Total GMRP packets Transmitted:  0
Join Empties:                     0
Join Ins:                         0
Leave Empties:                     0
Leave Ins:                         0
Empties:                          0
```

---

## show gmrp timer

To display GMRP timer values on a specified interface.

To modify the lines displayed, use the | (output modifier token) and to save the output to a file, use the > (output redirection token).

### Command Syntax

```
show gmrp timer IF_NAME
```

### Parameter

IF_NAME	Displays the name of the interface.
---------	-------------------------------------

### Command Mode

Exec and Privileged Exec mode

### Example

The following is an output of this command displaying the GMRP timer values for interface eth4.

```
#show gmrp timer eth4
Timer                Timer Value (centiseconds)
-----
Join                  20
Leave                  60
Leave All              1000
```



## CHAPTER 10 GVRP Commands

---

This chapter contains the GARP VLAN Registration Protocol commands. GVRP provides a method to dynamically share VLAN information and configure the needed VLANs. For example, in order to add a switch port to a VLAN, only the end port need be reconfigured, and all necessary VLAN trunks are dynamically created on the other GVRP-enabled switches. GVRP employs the GARP Information Declaration (GID) and GARP Information Propagation (GIP) that supply the common state machine descriptions and the common information propagation mechanisms defined for use in GARP-based applications.

This chapter provides a description, syntax, and examples of the GVRP commands. It includes the following commands:

- [clear gvrp](#) on page 224
- [debug gvrp](#) on page 225
- [set gvrp applicant](#) on page 226
- [set gvrp disable](#) on page 227
- [set gvrp dynamic-vlan-creation](#) on page 228
- [set gvrp enable](#) on page 229
- [set gvrp registration](#) on page 230
- [set gvrp timer](#) on page 231
- [set port gvrp](#) on page 232
- [show debugging gvrp](#) on page 233
- [show gvrp configuration](#) on page 234
- [show gvrp machine](#) on page 235
- [show gvrp statistics](#) on page 236
- [show gvrp timer](#) on page 237

---

## clear gvrp

Use this command to clear GVRP statistics for all VLANs or a specific VLAN.

### Command Syntax

```
clear gvrp statistics
clear gvrp statistics all
clear gvrp statistics bridge BRIDGE_NAME
clear gvrp statistics IFNAME
```

### Parameters

all	Clears a port name.
BRIDGE_NAME	Bridge identifier.
IFNAME	Clears an interface name.

### Command Mode

Exec and Privileged Exec mode

### Example

```
#clear gvrp statistics vid 333 bridge 2
```



---

## debug gvrp

Use this command to debug GVRP events, packets, timer starts, and commands, sending output to the console.

Use the `no` parameter to turn off debugging.

### Command Syntax

```
debug gvrp all
debug gvrp cli
debug gvrp event
debug gvrp packet
debug gvrp timer
no debug gvrp all
no debug gvrp cli
no debug gvrp event
no debug gvrp timer
no debug gvrp packet
```

### Parameters

<code>all</code>	Use this parameter to echo all of the above data types to the console.
<code>cli</code>	Use this parameter to echo commands to the console.
<code>event</code>	Use this parameter to echo events to the console.
<code>packet</code>	Use this parameter to echo packet contents to the console.
<code>timer</code>	Use this parameter to echo the time start to the console.

### Command Mode

Configure mode

### Example

```
#configure terminal
(config)#debug gvrp all
```

---

## set gvrp applicant

Use this command to set the GVRP applicant state to normal or active.

### Command Syntax

```
set gvrp applicant state normal IF_NAME
set gvrp applicant state active IF_NAME
```

### Parameters

active	Sets the active state.
normal	Sets the normal state.
IF_NAME	Name of the interface.

### Command Mode

Configure mode

### Examples

```
#configure terminal
(config)#set gvrp applicant state active eth0
```

---

## set gvrp disable

Use this command to disable (reset) GVRP globally on a switch for the default bridge instance. This command does not disable GVRP in all ports of a bridge.

### Command Syntax

```
set gvrp disable bridge BRIDGE_NAME
```

### Parameters

BRIDGE\_NAME      Bridge identifier.

### Command Mode

Configure mode

### Examples

```
#configure terminal
(config)#set gvrp disable bridge 12
```

---

## set gvrp dynamic-vlan-creation

Use this command to enable or disable dynamic VLAN creation for the default bridge instance.

### Command Syntax

```
set gvrp dynamic-vlan-creation enable bridge BRIDGE_NAME
set gvrp dynamic-vlan-creation disable bridge BRIDGE_NAME
```

### Parameters

enable	Enables dynamic VLAN creation for the default bridge instance.
disable	Disables dynamic VLAN creation for the default bridge instance.
BRIDGE_NAME	Bridge identifier.

### Command Mode

Configure mode

### Examples

```
#configure terminal
(config)#set gvrp dynamic-vlan-creation enable bridge 2
(config)#set gvrp dynamic-vlan-creation disable bridge 2
```

---

## set gvrp enable

Use this command to enable GVRP globally on a switch for a default bridge instance. This command does not enable GVRP for all ports of the bridge. After enabling GVRP globally, use the `set port gvrp` command to enable GVRP on individual ports of the bridge (see [set port gvrp](#) on page 232).

### Command Syntax

```
set gvrp enable bridge BRIDGE_NAME
```

### Parameters

`BRIDGE_NAME`      Bridge identifier.

### Command Mode

Configure mode

### Examples

```
#configure terminal
(config)#set gvrp enable bridge 12
```

---

## set gvrp registration

Use this command to set GVRP registration type.

### Command Syntax

```
set gvrp registration fixed IF_NAME
set gvrp registration forbidden IF_NAME
set gvrp registration normal IF_NAME
```

### Parameters

fixed	Determine that the multicast groups currently registered on the switch are applied to the port, but that subsequent registrations or de-registrations do not affect the port. This means that none of the registered multicast groups on the port are to be de-registered based on GARP timers.
forbidden	Indicates that all GVRP multicasts are de-registered, and prevents further GVRP multicast registration on the port.
normal	Set dynamic GVRP multicast registration and de-registration on the port.
IF_NAME	Defines a text string used as the name of the interface in ASCII format. Valid number of characters is between 1 and 16.

### Default

The default is normal registration for all the ports

### Command Mode

Configure mode

### Examples

```
#configure terminal
(config)#set gvrp registration fixed eth0
```

---

## set gvrp timer

Use this command to set the GVRP timers.

### Command Syntax

```
set gvrp timer join TIMER_VALUE IF_NAME
set gvrp timer leave TIMER_VALUE IF_NAME
set gvrp timer leaveall TIMER_VALUE IF_NAME
```

### Parameters

join	Specify the timer for joining the group.
leave	Specify the timer for leaving a group.
leaveall	Specify the timer for leaving all groups.
TIMER_VALUE	Specify the timer value in hundredths of a second.
IF_NAME	Specify the name of the interface.

### Command Mode

Configure mode

### Examples

```
#configure terminal
(config)#set gvrp timer leave 245 eth0
```

---

## set port gvrp

Use this command to enable or disable GVRP on a port or all ports in a bridge.

### Command Syntax

```
set port gvrp enable (IF_NAME|all)
set port gvrp disable (IF_NAME|all)
```

### Parameters

enable	Enables GVRP on a switch.
disable	Disables GVRP on a switch.
all	All ports added to recently configured bridge.
IF_NAME	Specify the name of the interface.

### Command Mode

Configure mode

### Examples

```
#configure terminal
(config)#set port gvrp enable eth0

#configure terminal
(config)#set port gvrp enable all
```



---

## show debugging gvrp

Use this command to display the status of the debugging for the GVRP system.

To modify the lines displayed, use the | (output modifier token). To save the output to a file, use the > (output redirection token).

### Command Syntax

```
show debugging gvrp
```

### Parameters

None

### Command Mode

Exec and Privileged Exec mode

### Examples

```
#show debugging gvrp
GVRP debugging status:
  GVRP Timer debugging is on
```

---

## show gvrp configuration

Use this command to display GvRP related configuration information for the default bridge.

### Command Syntax

```
show gvrp configuration
show gvrp configuration bridge BRIDGE_NAME
```

### Parameters

BRIDGE\_NAME      Bridge identifier.

### Command Mode

Exec and Privileged Exec mode

### Examples

```
#show gvrp configuration
Global GVRP Configuration for bridge 1:
Dynamic Vlan Creation: Disabled
Port based GVRP Configuration:

Port          GVRP Status    Registration    Applicant    Timers (centiseconds)
LeaveAll
Join          Leave
-----
% gvrp is not enabled on bridge 0
```

The following is an output of this command displaying the GVRP configuration for bridge 3.

```
#show gvrp configuration bridge 3
Global GVRP Configuration for bridge 3:
GVRP Feature: Enabled
Dynamic Vlan Creation: Disabled
Port based GVRP Configuration:

Timers (centiseconds)
Port          GVRP Status    Registration    Applicant    Join    Leave    LeaveAll
-----
--
eth4          Enabled        Normal         Normal       20      60      1000
eth5          Enabled        Normal         Normal       200     600     10000
```

---

## show gvrp machine

Use this command to display the state machine for GVRP, for the default bridge.

### Command Syntax

```
show gvrp machine bridge BRIDGE_NAME
```

### Parameters

BRIDGE\_NAME      Bridge identifier.

### Command Mode

Exec and Privileged Exec mode

### Example

The following is an output of this command displaying the GVRP state machine.

```
#show gvrp machine bridge 2
port = eth5 applicant state = QA   registrar state = INN
port = eth4 applicant state = QA   registrar state = INN
```

---

## show gvrp statistics

Use this command to display GVRP-related statistics for a bridge.

To modify the lines displayed, use the | (output modifier token). To save the output to a file, use the > (output redirection token).

### Command Syntax

```
show gvrp statistics
show gvrp statistics IFNAME
```

### Parameter

IFNAME                      Displays the name of the port.

### Command Mode

Exec and Privileged Exec mode

### Example

The following is an output of this command displaying a statistical summary for GVRP.

```
#show gvrp statistics
Bridge: 1
```

Port		JoinEmpty	JoinIn	LeaveEmpty	LeaveIn	Empty
-----						
eth5	RX		0	2	0	0
	TX		0	0	0	0
eth4	RX		0	1	0	1
	TX		0	0	0	0

---

## show gvrp timer

Use this command to display data for the timers.

To modify the lines displayed, use the | (output modifier token). To save the output to a file, use the > (output redirection token).

### Command Syntax

```
show gvrp timer IF_NAME
```

### Parameter

IF_NAME	Displays the name of the port.
---------	--------------------------------

### Command Mode

Exec and Privileged Exec mode

### Example

The following show output displays data for timer on interface `eth4`.

```
#show gvrp timer eth4
Timer                Timer Value (centiseconds)
-----
Join                 20
Leave                 60
Leave All             1000
```



## CHAPTER 11 MMRP Commands

---

This chapter lists the Multiple Multicast Registration Protocol (MMRP) commands for managing bridges. MMRP provides a mechanism to allow end stations and Media Access Control (MAC) bridges to dynamically register or deregister Group membership and individual MAC address information with bridges attached to the same LAN. The operation of MMRP relies upon services provided by the Multicast Registration Protocol (MRP).

This chapter provides a description, syntax, and examples of the MMRP commands. It includes the following commands:

- [clear mmrp](#) on page 240
- [set mmrp disable](#) on page 241
- [set mmrp enable](#) on page 242
- [set mmrp extended-filtering](#) on page 243
- [set mmrp fwdall](#) on page 244
- [set mmrp pointtopoint](#) on page 245
- [set mmrp registration](#) on page 246
- [set mmrp timer](#) on page 247
- [set port mmrp](#) on page 248
- [show mmrp configuration](#) on page 249
- [show mmrp machine](#) on page 250
- [show mmrp statistics](#) on page 251
- [show mmrp timer](#) on page 252

---

## clear mmrp

Use this command to clear MMRP statistics information for all interfaces or VLAN on a bridge.

### Command Syntax

```
clear mmrp statistics all
clear mmrp statistics all bridge BRIDGE_NAME
clear mmrp statistics vlanid <1-4094>
clear mmrp statistics vlanid <1-4094> bridge <1-32>
```

### Parameters

all	Clears all identifiers.
BRIDGE_NAME	Bridge identifier.
<1-4094>	Clears VLAN identifiers.
<1-32>	Specify a bridge identifier.

### Command Mode

Exec and Privileged Exec mode

### Examples

```
#configure terminal
(config)#clear mmrp statistics all bridge 2

#configure terminal
(config)#clear mmrp statistics vlanid 2 bridge 2
```



---

## set mmrp disable

Use this command to disable MMRP globally on the default bridge. This command does not disable MMRP for all ports of the bridge.

### Command Syntax

```
set mmrp disable bridge BRIDGE_NAME
set mmrp disable bridge BRIDGE_NAME vlan VLANID
set mmrp disable vlan VLANID
```

### Parameters

BRIDGE_NAME	Bridge identifier.
VLANID	VLAN identifier <1-4094>.

### Default

MMRP is disabled by default

### Command Mode

Configure mode

### Example

```
#configure terminal
(config)#set mmrp disable bridge 2
```

---

## set mmrp enable

Use this command to enable MMRP globally on the default bridge. This command does not enable MMRP for all ports of the bridge. After enabling MMRP globally, use the `set port mmrp` command to enable MMRP on individual ports of the bridge (see [set port mmrp](#) on page 248).

**Note:** MMRP cannot be enabled if IGMP Snooping is enabled, or if MMRP has already been configured for a particular VLAN.

### Command Syntax

```
set mmrp enable bridge BRIDGE_NAME
set mmrp enable bridge BRIDGE_NAME vlan VLANID
set mmrp enable vlan VLANID
```

### Parameters

BRIDGE_NAME	Bridge identifier.
VLANID	VLAN identifier <1-4094>.

### Default

MMRP is disabled by default

### Command Mode

Configure mode

### Example

To enable MMRP on a switch for a particular bridge 2:

```
#configure terminal
(config)#set mmrp enable bridge 2
MMRP is enabled for bridge 2
```

To enable MMRP on a switch on a particular bridge 3 when IGMP Snooping is enabled:

```
#configure terminal
(config)#set mmrp enable bridge 3
Disable IGMP Snooping and then enable MMRP on bridge 3
```

---

## set mmrp extended-filtering

Use this command to enable or disable extended filtering on the default bridge as per Table 8-7 of IEEE802.1Q-2003.

### Command Syntax

```
set mmrp extended-filtering enable bridge BRIDGE_NAME
set mmrp extended-filtering disable bridge BRIDGE_NAME
```

### Parameters

enable	Enables MMRP on a switch.
disable	Disables MMRP on a switch.
BRIDGE_NAME	Bridge identifier.

### Default

Extended filtering is disabled on a MMRP-enabled bridge.

### Command Mode

Configure mode

### Examples

Enable extended filtering services on bridge 1:

```
#configure terminal
(config)#set mmrp extended-filtering enable bridge 1
```

---

## set mmrp fwdall

Use this command to enable or disable the forward-all configuration on a MMRP port.

### Command Syntax

```
set mmrp fwdall disable IF_NAME
set mmrp fwdall enable IF_NAME
```

### Parameters

disable	Disables forward-all MMRP configuration on a switch.
enable	Enables forward-all MMRP configuration on a switch.
IF_NAME	The identity of the interface.

### Default

The forwardall configuration is disabled by default.

### Command Mode

Configure mode

### Example

```
#configure terminal
(config)#set mmrp fwdall disable eth1
```

---

## set mmrp pointtopoint

Use this command to enable or disable the point-to-point behavior on an MMRP-enabled bridge.

### Command Syntax

```
set mmrp pointtopoint (enable|disable) interface IF_NAME
```

### Parameters

enable	Enables point-to-point MMRP behavior on a switch.
disable	Disables point-to-point MMRP behavior on a switch.
interface	The identity of the interface.

### Default

Point-to-point behavior is disabled by default.

### Command Mode

Configure mode

### Examples

```
#configure terminal
(config)#set mmrp pointtopoint enable interface eth1

#configure terminal
(config)#set mmrp pointtopoint disable interface eth1
```

---

## set mmrp registration

Use this command to set MMRP registration type.

### Command Syntax

```
set mmrp registration fixed IF_NAME
set mmrp registration forbidden IF_NAME
set mmrp registration normal IF_NAME
set mmrp registration restricted IF_NAME
```

### Parameters

fixed	Determine that the multicast groups currently registered on the switch are applied to the port, but that subsequent registrations or de-registrations do not affect the port. This means that none of the registered multicast groups on the port are to be de-registered based on GARP timers.
forbidden	Indicates that all MMRP multicasts are de-registered, and prevents further MMRP multicast registration on the port.
normal	Set dynamic MMRP multicast registration and de-registration on the port.
restricted	Defines a restricted registration.
IF_NAME	Defines a text string used as the name of the interface in ASCII format. Valid number of characters is between 1 and 16.

### Default

The default MMRP registration mode is Normal.

### Command Mode

Configure mode

### Examples

```
#configure terminal
(config)#set mmrp registration fixed eth1

#configure terminal
(config)#set mmrp registration forbidden eth1

#configure terminal
(config)#set mmrp registration normal eth1
```

---

## set mmrp timer

Use this command to set the values for the MMRP Join, Leave, and Leaveall timers for a specified bridge. The relationship for the timer values are as follows:

- Leave timer must be greater than, or equal to, three times the join timer.
- Leaveall timer must be greater than the leave timer.

### Command Syntax

```
set mmrp timer join TIMER_VALUE IF_NAME
set mmrp timer leave TIMER_VALUE IF_NAME
set mmrp timer leaveall TIMER_VALUE IF_NAME
```

### Parameters

join	Specify the timer for joining the group.
leave	Specify the timer for leaving a group.
leaveall	Specify the timer for leaving all groups.
TIMER_VALUE	Specify the timer value in hundredths of a second.
IF_NAME	Specify the name of the interface.

### Default

Default for the join timer is 200 milliseconds (ms).

### Command Mode

Configure mode

### Examples

```
#configure terminal
(config)#set mmrp timer join 300 eth1
```

---

## set port mmrp

Use this command to enable or disable MMRP on a selected port, on all ports on a bridge, or on a particular VLAN of a port.

### Command Syntax

```
set port mmrp disable (IF_NAME|all)
set port mmrp enable (IF_NAME|all)
set port mmrp disable IF_NAME vlan VLANID
set port mmrp enable IF_NAME vlan VLANID
```

### Parameters

enable	Enables MMRP on a switch.
disable	Disables MMRP on a switch.
all	All ports added to recently configured bridge.
IF_NAME	Specify the name of the interface.
VLANID	VLAN identifier <1-4094>.

### Default

This setting is disabled by default.

### Command Mode

Configure mode

### Examples

To disable MMRP on a selected interface on a bridge, use this command structure:

```
#configure terminal
(config)#set port mmrp disable eth1
```

To disable MMRP on all interfaces on a bridge, use this command structure:

```
#configure terminal
(config)#set port mmrp disable all

#configure terminal
(config)#set port mmrp disable eth1 vlan 4
```



---

## show mmrp configuration

Use this command to display MMRP related configuration information for the default bridge.

### Command Syntax

```
show mmrp configuration bridge BRIDGE_NAME
```

### Parameters

BRIDGE\_NAME      Bridge identifier.

### Command Mode

Exec and Privileged Exec mode

### Examples

The following is an output of this command displaying MMRP-related configuration information:

```
#show mmrp configuration bridge 2
Global MMRP Configuration for bridge:2
MMRP Feature: Enabled

MMRP Timers (centiseconds):
MMRP:           20
Leave:           60
Leave All:       1000

Port based MMRP Configuration:
MMRP Status      Registration    Forward All    Port
-----
Enabled          Normal          Disabled       eth4
Enabled          Normal          Disabled       eth5
```

---

## show mmrp machine

Use this command to display the state machine for MMRP, for the default bridge.

### Command Syntax

```
show mmrp machine bridge BRIDGE_NAME
```

### Parameters

BRIDGE\_NAME      Bridge identifier.

### Mode

Exec and Privileged Exec mode

### Examples

The following sample output from this command displays the MMRP state machine information.

```
#show mmrp machine bridge 1
port = eth 2  VLAN = 1
      applicant state[0] = LO  registrar state[0] = MT
      applicant state[1] = LO  registrar state[1] = MT
```

---

## show mmrp statistics

Use this command to display a statistical summary for a VLAN.

To modify the lines displayed, use the | (output modifier token). To save the output to a file, use the > (output redirection token).

### Command Syntax

```
show mmrp statistics vlanid <1-4094>
show mmrp statistics vlanid <1-4094> (bridge <1-32>|)
```

### Parameters

<1-4094>	Displays the VLAN identifier.
<1-32>	Displays the bridge identifier.

### Command Mode

Exec and Privileged Exec mode

### Example

The following is an output of this command displaying a statistical summary for MMRP.

```
#show mmrp statistics vlan 123

MMRP Statistics for bridge 0 vlan 1
-----
Total MMRP Events Received:      0
New Ins:                         0
Join Ins:                        0
Leave:                            0
Null:                           0
New Empties:                     0
Join Empties:                    0
Empties:                         0
Total MMRP Events Transmitted:   0
New Ins:                         0
Join Ins:                        0
Leave:                            0
Null:                           0
New Empties:                     0
Join Empties:                    0
Empties:                         0
```

---

## show mmrp timer

Use this command to display MMRP timer values associated with an interface.

### Command Syntax

```
show mmrp timer IF_NAME
```

### Parameters

IFNAME                      Displays the name of the port.

### Command Mode

Exec and Privileged Exec mode

### Example

The following sample output from this command displays all MMRP timer values associated with the interface `eth2`.

```
#show mmrp timer eth2
Timer           Timer Value (centiseconds)
-----
Join            20
Leave            60
Leave All       1000
```

## CHAPTER 12 MVRP Commands

---

This chapter contains the Multiple VLAN Registration Protocol (MVRP) commands. MVRP uses the Multicast Registration Protocol (MRP) attribute declaration and propagation features to dynamically establish and update VLAN information, for example, which VLAN has active members, and through which ports can those members be reached.

This chapter provides a description, syntax, and examples of the MVRP commands. It includes the following commands:

- [clear mvrp](#) on page 254
- [set mvrp applicant](#) on page 255
- [set mvrp disable](#) on page 256
- [set mvrp dynamic-vlan-creation](#) on page 257
- [set mvrp enable](#) on page 258
- [set mvrp pointtopoint](#) on page 259
- [set mvrp registration](#) on page 260
- [set mvrp timer](#) on page 261
- [set port mvrp](#) on page 262
- [show mvrp configuration](#) on page 263
- [show mvrp machine](#) on page 264
- [show mvrp statistics](#) on page 265
- [show mvrp timer](#) on page 266

---

## clear mvrp

Use this command to clear the MVRP statistics for an interface.

### Command Syntax

```
clear mvrp statistics
clear mvrp statistics all
clear mvrp statistics bridge BRIDGE_NAME
clear mvrp statistics IFNAME
```

### Parameters

IFNAME	Clears an interface name.
all	Clears a port name.
BRIDGE_NAME	Bridge identifier.

### Default

This functionality is disabled by default.

### Command Mode

Exec and Privileged Exec mode

### Examples

```
#clear mvrp statistics eth1
#clear mvrp statistics all
#clear mvrp statistics bridge 2
```

---

## set mvrp applicant

Use this command to set the MVRP applicant state.

### Command Syntax

```
set mvrp applicant state active IF_NAME
set mvrp applicant state normal IF_NAME
```

### Parameters

state	Sets the state of the applicant.
active	Sets the active state.
normal	Sets the normal state.
IF_NAME	Adds the name of the interface.

### Default

The default MVRP applicant state is normal.

### Command Mode

Configure mode

### Examples

```
#configure terminal
(config)#set mvrp applicant state active eth1

#configure terminal
(config)#set mvrp applicant state normal eth1
```

---

## set mvrp disable

Use this command to disable (reset) MVRP globally on a switch and for a default bridge instance. This command does not disable MVRP in all ports of the bridge.

### Command Syntax

```
set mvrp disable bridge BRIDGE_NAME
```

### Parameters

BRIDGE_NAME	Bridge identifier
-------------	-------------------

### Command Mode

Configure mode

### Examples

```
#configure terminal
(config)#set mvrp disable bridge bridge7
```



---

## set mvrp dynamic-vlan-creation

Use this command to enable or disable dynamic VLAN creation for the default bridge instance.

### Command Syntax

```
set mvrp dynamic-vlan-creation enable bridge BRIDGE_NAME
set mvrp dynamic-vlan-creation disable bridge BRIDGE_NAME
```

### Parameters

enable	Enables MVRP on a switch.
disable	Disables MVRP on a switch.
BRIDGE_NAME	Bridge identifier.

### Command Mode

Configure mode

### Examples

```
#configure terminal
(config)#set mvrp dynamic-vlan-creation enable bridge 1
(config)#set mvrp dynamic-vlan-creation disable bridge 1
```

---

## set mvrp enable

Use this command to enable (set) MVRP globally on a switch and for a default bridge instance. This command does not enable MVRP in all ports of the bridge. After enabling MVRP globally, use the `set port mvrp` command to enable MVRP on individual ports of the bridge (see [set port mvrp](#) on page 262).

### Command Syntax

```
set mvrp enable bridge BRIDGE_NAME
```

### Parameters

`BRIDGE_NAME`      Bridge identifier.

### Command Mode

Configure mode

### Examples

```
#configure terminal
(config)#set mvrp enable bridge 1
```

---

## set mvrp pointtopoint

Use this command to enable or disable the point-to-point behavior on an mvrp-enabled bridge.

### Command Syntax

```
set mvrp pointtopoint (enable|disable) interface IF_NAME
```

### Parameters

enable	Enables point-to-point MVRP behavior on a switch.
disable	Disables point-to-point MVRP behavior on a switch.
interface	Identities the name of the interface.

### Default

Point-to-point behavior is disabled by default.

### Command Mode

Configure mode

### Examples

```
#configure terminal
(config)#set mvrp pointtopoint enable interface eth1

#configure terminal
(config)#set mvrp pointtopoint disable interface eth1
```

---

## set mvrp registration

Use this command to set the MVRP registration mode to fixed.

### Command Syntax

```
set mvrp registration fixed IF_NAME
set mvrp registration forbidden IF_NAME
set mvrp registration normal IF_NAME
```

### Parameters

fixed	Determine that the multicast groups currently registered on the switch are applied to the port, but that subsequent registrations or de-registrations do not affect the port. This means that none of the registered multicast groups on the port are to be de-registered based on GARP timers.
forbidden	Indicates that all MVRP multicasts are de-registered, and prevents further MVRP multicast registration on the port.
normal	Set dynamic MVRP multicast registration and de-registration on the port.
IF_NAME	Defines a text string used as the name of the interface in ASCII format. Valid number of characters is between 1 and 16.

### Default

The default MVRP registration mode is normal.

### Command Mode

Configure mode

### Examples

```
#configure terminal
(config)#set mvrp registration fixed eth1
```

---

## set mvrp timer

Use this command to set the MVRP join timer value.

### Command Syntax

```
set mvrp timer join TIMER_VALUE IF_NAME
set mvrp timer leave TIMER_VALUE IF_NAME
set mvrp timer leaveall TIMER_VALUE IF_NAME
```

### Parameters

join	Specify the timer for joining the group.
leave	Specify the timer for leaving a group.
leaveall	Specify the timer for leaving all groups.
TIMER_VALUE	Specify the timer value in hundredths of a second.
IFNAME	Specify the name of the interface.

### Command Mode

Configure mode

### Examples

```
#configure terminal
(config)#set mvrp timer join 300 eth1

#configure terminal
(config)#set mvrp timer leave 300 eth1

#configure terminal
(config)#set mvrp timer leaveall 20000 eth1
```

---

## set port mvrp

Use this command to enable or disable MVRP on a selected port or on all ports on a bridge.

### Command Syntax

```
set port mvrp enable (IF_NAME|all)
set port mvrp disable (IF_NAME|all)
```

### Parameters

enable	Enables MVRP on a switch.
disable	Disables MVRP on a switch.
all	All ports added to recently configured bridge.
IF_NAME	The identity of the interface.

### Default

This setting is disabled by default.

### Command Mode

Configure mode

### Examples

To enable MVRP on a selected interface, use this command structure:

```
#configure terminal
(config)#set port mvrp enable eth1
```

To enable MVRP on all interfaces, use this command structure:

```
#configure terminal
(config)#set port mvrp enable all
```

To disable MVRP on a selected interface on a bridge, use this command structure:

```
#configure terminal
(config)#set port mvrp disable eth1
```

To disable MVRP on all interfaces on a bridge, use this command structure:

```
#configure terminal
(config)#set port mvrp disable all
```

---

## show mvrp configuration

Use this command to display the MVRP configurations for a bridge.

### Command Syntax

```
show mvrp configuration
show mvrp configuration bridge BRIDGE_NAME
```

### Parameter

BRIDGE\_NAME      Bridge identifier.

### Command Mode

Exec and Privileged Exec mode

### Example

The following is sample output from this command displaying all the MVRP configurations on the MVRP-enabled bridge 1.

```
#show mvrp configuration bridge 1
Global MVRP Configuration for bridge 1:
Dynamic Vlan Creation: Enabled
Port based MVRP Configuration:
```

Timers (centiseconds)

Port	MVRP Status	Registration	Applicant	Timers (centiseconds)		
				Join	Leave	
eth2	Enabled	Normal	Normal	20	60	1000
eth1	Enabled	Normal	Normal	20	60	1000

---

## show mvrp machine

Use this command to display the MVRP machine state on a specific bridge.

### Command Syntax

```
show mvrp machine bridge BRIDGE_NAME
```

### Parameter

BRIDGE\_NAME      Bridge identifier.

### Command Mode

Exec and Privileged Exec mode

### Example

The following sample output from this command displays the MVRP machine state on an MVRP-enabled bridge.

```
#show mvrp machine bridge 1
port = eth2                    applicant state[0] = VO   registrar state[0] = IN
```



---

## show mvrp statistics

Use this command to display MVRP statistics for a bridge.

### Command Syntax

```
show mvrp statistics
show mvrp statistics IFNAME
```

### Parameter

IFNAME                      Displays the name of the interface.

### Command Mode

Exec and Privileged Exec mode

### Examples

The following sample output from this command displays all MVRP statistics for an MVRP-enabled bridge.

```
#show mvrp statistics
Bridge: 1
```

Port		JoinEmpty	JoinIn	LeaveEmpty	LeaveIn	Empty	NewIn	NewEmpty
eth2	RX	0	0	0	0	0	0	0
	TX	0	0	0	0	4	0	0
eth1	RX	0	0	0	0	0	0	0
	TX	0	0	0	0	0	0	0

The following sample output from this command displays the MVRP statistics for a specific interface.

```
#show mvrp statistics eth2
Bridge: 1
```

Port		JoinEmpty	JoinIn	LeaveEmpty	LeaveIn	Empty	NewIn	NewEmpty
eth2	RX	0	0	0	0	0	0	0
	TX	0	0	0	0	12	0	0

---

## show mvrp timer

Use this command to display MVRP timer values associated with a specific interface.

### Command Syntax

```
show mvrp timer IF_NAME
```

### Parameter

IFNAME                      Displays the name of the interface.

### Command Mode

Exec and Privileged Exec mode

### Command Mode

Configure mode

### Example

The following sample output from this command displays all MVRP timer values associated with interface eth2.

```
#show mvrp timer eth2
Timer                Timer Value (centiseconds)
-----
Join                 20
Leave                 60Examples
```

## CHAPTER 13 VLAN and Private VLAN Commands

---

This chapter has the commands used to manage VLANs and Private VLANs. A private VLAN contains switch ports that cannot communicate with each other, but can access other networks. This chapter includes the following commands:

Note: PBB is not supported on hardware platforms.

- [private-vlan association](#) on page 269
- [private-vlan community](#) on page 270
- [private-vlan isolated](#) on page 271
- [private-vlan primary](#) on page 272
- [show vlan](#) on page 273
- [show vlan access-map](#) on page 274
- [show vlan all](#) on page 275
- [show vlan auto](#) on page 276
- [show vlan brief](#) on page 277
- [show vlan classifier](#) on page 278
- [switchport access](#) on page 279
- [switchport beb vlan](#) on page 280
- [switchport hybrid](#) on page 281
- [switchport mode access](#) on page 282
- [switchport mode hybrid acceptable-frame-type](#) on page 283
- [switchport mode hybrid ingress-filter](#) on page 284
- [switchport mode trunk](#) on page 285
- [switchport trunk allowed](#) on page 286
- [switchport trunk native](#) on page 287
- [switchport mode private-vlan](#) on page 288
- [switchport private-vlan host-association](#) on page 289
- [switchport private-vlan mapping](#) on page 290
- [vlan bridge allowed](#) on page 291
- [vlan classifier group](#) on page 292
- [vlan classifier rule ipv4](#) on page 293
- [vlan classifier rule mac](#) on page 294
- [vlan classifier rule proto](#) on page 295
- [vlan database](#) on page 297
- [vlan bridge forbidden](#) on page 298
- [vlan mtu](#) on page 299
- [vlan name](#) on page 300
- [vlan state](#) on page 301

- [vlan type](#) on page 302
- [vlan type customer](#) on page 303
- [vlan type service](#) on page 304
- [vlan VLAN\\_RANGE bridge](#) on page 306
- [vlan VLAN\\_RANGE provider/edge bridge](#) on page 307
- [vlan VLAN\\_RANGE backbone](#) on page 309

---

## private-vlan association

Use this command to associate a secondary VLAN to a primary VLAN. Only one isolated VLAN can be associated to a primary VLAN. Multiple community VLANs can be associated to a primary VLAN.

Use the `no` form of this command to remove association of all the secondary VLANs to a primary VLAN.

### Command Syntax

```
private-vlan <2-4094> association add VLAN_ID bridge <1-32>
private-vlan <2-4094> association remove VLAN_ID bridge <1-32>
no private-vlan <2-4094> association bridge <1-32>
```

### Parameters

<2-4094>	Specify a private VLAN identifier.
add	Adds values associated with a single VLAN.
remove	Removes values associated with a single VLAN.
VLAN_ID	Specify a secondary VLAN identifier <2-4094>.
bridge	Specify the bridge group ID.

### Default

This functionality is disabled by default.

### Command Mode

VLAN Configuration mode

### Example

```
#configure terminal
(config)#vlan database
(config-vlan)#private-vlan 2 association add 3-4 bridge 1
(config-vlan)#private-vlan 2 association remove 3-4 bridge 1
(config-vlan)#no private-vlan 2 association bridge 1
```

---

## private-vlan community

Use this command to set a VLAN type for a private (community) VLAN.

Use the `no` form of this command to remove the specified private VLAN.

### Command Syntax

```
private-vlan <2-4094> community bridge <1-32>  
no private-vlan <2-4094> community bridge <1-32>
```

### Parameters

<code>&lt;2-4094&gt;</code>	Specify a private VLAN identifier.
<code>bridge</code>	Specify the bridge identifier.

### Default

This functionality is disabled by default.

### Command Mode

VLAN Configuration mode

### Example

```
#configure terminal  
(config)#vlan database  
(config-vlan)#private-vlan 4 community bridge 1
```

---

## private-vlan isolated

Use this command to create an isolated VLAN.

Use the `no` form of this command to remove the specified private VLAN.

### Command Syntax

```
private-vlan <2-4094> isolated bridge <1-32>
no private-vlan <2-4094> isolated bridge <1-32>
```

### Parameters

<code>&lt;2-4094&gt;</code>	Specify a private VLAN identifier.
<code>bridge</code>	Specify the bridge identifier.

### Default

This functionality is disabled by default.

### Command Mode

VLAN Configuration mode

### Example

```
#configure terminal
(config)#vlan database
(config-vlan)#private-vlan 3 isolated bridge 1
```

---

## private-vlan primary

Use this command to create a primary VLAN.

Use the `no` form of this command to remove the specified private VLAN.

### Command Syntax

```
private-vlan <2-4094> primary bridge <1-32>  
no private-vlan <2-4094> primary bridge <1-32>
```

### Parameters

<code>&lt;2-4094&gt;</code>	Specify a private VLAN identifier.
<code>bridge</code>	Specify the bridge identifier.

### Default

This functionality is disabled by default.

### Command Mode

VLAN Configuration mode

### Example

```
#configure terminal  
(config)#vlan database  
(config-vlan)#private-vlan 2 primary bridge 1
```



---

## show vlan

Use this command to display information about a particular VLAN. It displays information for all the bridges configured.

### Command Syntax

```
show vlan (<2-4094> static-ports | static-ports)
```

### Parameters

<2-4094>	Display the VLAN identifier.
static-ports	Display static egress/forbidden ports.

### Command Mode

Exec mode and Privileged Exec mode

### Example

The following is an output of this command displaying information about VLAN 2.

```
#show vlan 2
Bridge Group: 1
Bridge Group: 0
#
```

---

## show vlan access-map

Use this command to display information for VLAN access maps.

### Command Syntax

```
show vlan access-map
```

### Parameters

None

### Command Mode

Exec mode and Privileged Exec mode

### Example

The following is a sample output from this command when using the `access-map` parameter.

```
#show vlan access-map
```

---

## show vlan all

Use this command to display information for all VLANs.

### Command Syntax

```
show vlan all
show vlan all bridge <1-32>
```

### Parameters

bridge            Displays the bridge group ID.

### Command Mode

Exec mode and Privileged Exec mode

### Example

The following is a sample output from this command when using the `all` parameter.

```
#show vlan all
Bridge          VLAN ID  Name                State  Member ports
                (u)-Untagged, (t)-Tagged
=====
0               1         default            ACTIVE
#
```

---

## show vlan auto

Use this command to display information for VLANs that were auto-configured.

### Command Syntax

```
show vlan auto
show vlan auto bridge <1-32>
```

### Parameters

`bridge`                Displays the bridge group ID.

### Command Mode

Exec mode and Privileged Exec mode

### Example

The following is a sample output from this command when using the `all` parameter.

```
#show vlan auto
```

Bridge	VLAN ID	Name	State	Member ports
				(u)-Untagged, (t)-Tagged
=====	=====	=====	=====	=====
Bridge	VLAN ID	Name	State	Member ports
				(u)-Untagged, (t)-Tagged
=====	=====	=====	=====	=====

---

## show vlan brief

Use this command to display brief VLAN information for all bridges, either static or dynamic.

### Command Syntax

```
show vlan (brief | <2-4094>)
```

### Parameters

None

### Command Mode

Exec mode and Privileged Exec mode

### Example

The following is a sample output from this command when using the `all` parameter.

```
#show vlan brief

                                Bridge Group : 1

Bridge          VLAN ID  Name                State  Member ports
=====
1                1        default            ACTIVE  eth2 (u)
                                (u)-Untagged, (t)-Tagged
=====

                                Bridge Group : 0

0                1        default            ACTIVE
0                2        new                ACTIVE
```

---

## show vlan classifier

Use this command to display information on configured VLAN classifier groups, interfaces configured for a VLAN group or all the groups, or all configured VLAN classifier rules.

If either a group ID or rule ID is not specified, all configured VLAN classifier rules are shown. If either a group ID or rule ID is specified, a specific configured VLAN classifier rule is shown.

### Command Syntax

```
show vlan classifier group interface IFNAME
show vlan classifier group (<1-16>|)
show vlan classifier rule(<1-256>|)
```

### Parameters

group	Displays group activated information.
<1-16>	Displays the group ID
interface	Displays interface information.
interface	Displays interface group information.
group	Displays group activated information.
<1-16>	Displays the group ID.
rule	Displays VLAN classifier rule ID.
<1-256>	Displays rule ID information.

### Command Mode

Exec mode and Privileged Exec mode

### Example

This example displays groups for VLAN classifier groups:

```
#show vlan classifier group 1
vlan classifier group 1 add rule 1
```

This example displays interfaces for all VLAN classifier groups:

```
#show vlan classifier interface group
vlan classifier group 1 interface fe2
vlan classifier group 1 interface fe3
vlan classifier group 2 interface fe5
vlan classifier group 3 interface fe7
```

This example displays interfaces for VLAN classifier group 1:

```
#show vlan classifier interface group 1
vlan classifier group 1 interface fe2
vlan classifier group 1 interface fe3
```

This example displays interfaces for VLAN classifier rule 1:

```
#show vlan classifier rule 1
vlan classifier group 1 add rule 1
```

---

## switchport access

Use this command to change the default VLAN on the current interface.

**Note:** IP Infusion Inc. does not recommend using VLAN identifier 1 because of interoperability issues with other vendors' equipment.

Use the `no` parameter to remove an existing VLAN.

### Command Syntax

```
switchport access vlan <2-4094>
no switchport access vlan
```

### Parameter

`<2-4094>` Specify the VLAN identifier.

### Command Mode

Interface mode

### Examples

This example shows the steps of a typical VLAN session, creating and destroying a VLAN.

```
#configure terminal
(config)#interface eth0
(config-if)#switchport access vlan 3

(config)#interface eth0
(config-if)#no switchport access vlan
```

---

## switchport beb vlan

This command is used to configure VLAN ports for Provider Bridges (PBB). Use this command to set the default VLAN identifier (Provider VID) for a Customer Network Port (CNP), Provider Instance Port (PIP), Customer Port (CBP), or Provider Network Port (PNP).

Use the `no` form of this command to remove the Provider VLAN identifier from a CNP, PIP, CBP or PNP.

**Note:** When this command is issued to set the default VLAN identifier, it is installed in hardware for the port immediately

### Command Syntax

```
switchport beb vlan <2-4094> (cbp|pnp)
switchport beb vlan <2-4094> (cnp|pip)
switchport beb vlan <2-4094> (cnp|pip|cbp|pnp)
no switchport beb vlan <2-4094> (cbp |pnp)
no switchport beb vlan <2-4094> (cnp |pip)
no switchport beb vlan <2-4094> (cnp |pnp)
```

### Parameters

<2-4094>	Specify the VLAN identifier.
cbp	Customer port.
cnp	Customer network port.
pip	Provider instance port.
pnp	Provider network port.

### Command Mode

Interface mode

### Examples

This example designates interface `eth0` on VLAN 2 as a BEB customer network port

```
#configure terminal
(config)#interface eth0
(config-if)#switchport beb vlan 2 cnp
```

This example removes `eth0` as a BEB customer network port for VLAN 2

```
(config)#interface eth0
(config-if)#no switchport beb vlan 2 cnp
```



---

## switchport hybrid

Use this command to set the switching characteristics of the interface to hybrid. Both tagged and untagged frames will be classified over hybrid interfaces.

For a VLAN range, specify two VLAN identifiers: the lowest and then the highest separated by a hyphen. For a VLAN list, specify the VLAN identifiers separated by commas. Do not enter spaces between the hyphens or commas.

Use the `no` parameter to turn off allowed hybrid switching.

### Command Syntax

```
switchport hybrid allowed vlan all
switchport hybrid allowed vlan none
switchport hybrid allowed vlan except VLAN_ID
switchport (hybrid) allowed vlan remove VLAN_ID
switchport (hybrid) allowed vlan add VLAN_ID egress-tagged (enable|disable)
no switchport hybrid
```

### Parameters

<code>all</code>	Allow all VLANs to transmit and receive through the interface.
<code>none</code>	Allow no VLANs to transmit and receive through the interface.
<code>except</code>	Allow all VLANs except these VLANs to transmit and receive through the interface.
<code>VLAN_ID</code>	VLAN identifier(s) <2-4094>. You can specify a single VLAN, a VLAN range, or a VLAN list.
<code>remove</code>	Remove these VLANs from the member set.
<code>VLAN_ID</code>	VLAN identifier(s) <2-4094>. You can specify a single VLAN, a VLAN range, or a VLAN list.
<code>add</code>	Add these VLANs to the member set.
<code>VLAN_ID</code>	VLAN identifier(s) <2-4094>. You can specify a single VLAN, a VLAN range, or a VLAN list.
<code>egress-tagged</code>	Whether to tag outgoing frames.
<code>enable</code>	Enable egress tagging for outgoing frames.
<code>disable</code>	Disable egress tagging for outgoing frames.

### Command Mode

Interface mode

### Examples

The following shows adding a single VLAN to the member set.

```
(config-if)#switchport hybrid allowed vlan add eg
switchport hybrid allowed vlan add 2 egress-tagged enable
```

The following shows adding a range of VLANs to the member set.

```
(config-if)#switchport hybrid allowed vlan add eg
switchport hybrid allowed vlan add 2-4 egress-tagged enable
```

---

## switchport mode access

Use this command to set the switching characteristics of the interface to access mode, and classify untagged frames only. Received frames are classified based on the VLAN characteristics, then accepted or discarded based on the specified filtering criteria.

### Command Syntax

```
switchport mode access
switchport mode access ingress-filter (enable|disable)
```

### Parameters

<code>ingress-filter</code>	Set the ingress filtering for the received frames.
<code>enable</code>	Set the ingress filtering for received frames. Received frames that cannot be classified in the previous step based on the acceptable frame type parameter (access/trunk) are discarded. This is the default value.
<code>disable</code>	Turn off ingress filtering to accept frames that do not meet the classification criteria.

### Default

Received frames that cannot be classified in the previous step based on the acceptable frame type parameter (access/trunk) are discarded.

### Command Mode

Interface mode

### Example

```
#configure terminal
(config)#interface eth0
(config-if)#switchport mode access ingress-filter enable
```

---

## switchport mode hybrid acceptable-frame-type

Use this command to set the interface acceptable frame types. This processing occurs after VLAN classification.

### Command Syntax

```
switchport mode hybrid acceptable-frame-type (all|vlan-tagged)
```

### Parameters

all	Set all frames can be received
vlan-tagged	Accept only classified frames that belong to the port's member set.

### Default

Received frames that cannot be classified in the previous step based on the acceptable frame type parameter (access/trunk) are discarded.

### Command Mode

Interface mode

### Example

```
#configure terminal
(config)#interface eth0
(config-if)#switchport mode hybrid acceptable-frame-type vlan-tagged
```

---

## switchport mode hybrid ingress-filter

Use this command to set the switching characteristics of the interface as hybrid, and classify both tagged and untagged frames. Received frames are classified based on the VLAN characteristics, then accepted or discarded based on the specified filtering criteria.

### Command Syntax

```
switchport mode hybrid ingress-filter (enable|disable)
```

### Parameters

enable	Set the ingress filtering for received frames. Received frames that cannot be classified in the previous step based on the acceptable frame type parameter (access/trunk) are discarded. This is the default value.
disable	Turn off ingress filtering to accept frames that do not meet the classification criteria. .

### Default

Received frames that cannot be classified in the previous step based on the acceptable frame type parameter (access/trunk) are discarded.

### Command Mode

Interface mode

### Examples

```
#configure terminal
(config)#interface eth0
(config-if)#switchport mode hybrid ingress-filter enable
```

---

## switchport mode trunk

Use this command to set the switching characteristics of the interface as trunk, and specify only tagged frames. Received frames are classified based on the VLAN characteristics, then accepted or discarded based on the specified filtering criteria.

### Command Syntax

```
switchport mode trunk ingress-filter (enable|disable)
```

### Parameters

<code>ingress-filter</code>	Set the ingress filtering for the received frames.
<code>enable</code>	Set the ingress filtering for received frames. Received frames that cannot be classified in the previous step based on the acceptable frame type parameter (access/trunk) are discarded. This is the default value.
<code>disable</code>	Turn off ingress filtering to accept frames that do not meet the classification criteria. .

### Default

Received frames that cannot be classified in the previous step based on the acceptable frame type parameter (access/trunk) are discarded.

### Command Mode

Interface mode

### Examples

```
#configure terminal
(config)#interface eth0
(config-if)#switchport mode trunk ingress-filter enable
```

---

## switchport trunk allowed

Use this command to set the switching characteristics of the interface to trunk.

For a VLAN range, specify two VLAN identifiers: the lowest and then the highest separated by a hyphen. For a VLAN list, specify the VLAN identifiers separated by commas. Do not enter spaces between the hyphens or commas.

Use the `no` parameter to remove all VLAN identifiers configured on this port.

### Command Syntax

```
switchport trunk allowed vlan all
switchport trunk allowed vlan none
switchport trunk allowed vlan add VLAN_ID
switchport trunk allowed vlan except VLAN_ID
switchport trunk allowed vlan remove VLAN_ID
no switchport trunk
```

### Parameters

<code>all</code>	Allow all VLANs to transmit and receive through the interface.
<code>none</code>	Allow no VLANs to transmit and receive through the interface.
<code>add</code>	Add these VLANs to the member set.
<code>VLAN_ID</code>	VLAN identifier(s) <2-4094>. You can specify a single VLAN, a VLAN range, or a VLAN list.
<code>except</code>	All VLANs except these VLANs are part of the member set.
<code>VLAN_ID</code>	VLAN identifier(s) <2-4094>. You can specify a single VLAN, a VLAN range, or a VLAN list.
<code>remove</code>	Remove these VLANs from the member set.
<code>VLAN_ID</code>	VLAN identifier(s) <2-4094>. You can specify a single VLAN, a VLAN range, or a VLAN list.

### Default

Received frames that cannot be classified in the previous step based on the acceptable frame type parameter (access/trunk) are discarded.

### Command Mode

Interface mode

### Examples

The following shows adding a single VLAN to the port's member set.

```
(config)#interface eth0
(config-if)#switchport trunk allowed vlan add V2
```

The following shows adding a range of VLANs to the port's member set.

```
(config)#interface eth0
(config-if)#switchport trunk allowed vlan add V2-4
```

---

## switchport trunk native

Use this command to configure native VLANs for this port. The native VLAN is used for classifying the incoming untagged packets.

Use the `no` parameter to revert the native VLAN to the default VLAN identifier 1.

### Command Syntax

```
switchport trunk native vlan VLAN_ID
no switchport trunk native vlan
```

### Parameter

`VLAN_ID` VLAN identifier(s) <2-4094>. You can specify a single VLAN, a VLAN range, or a VLAN list.

For a VLAN range, specify two VLAN identifiers: the lowest and then the highest separated by a hyphen. For a VLAN list, specify the VLAN identifiers separated by commas. Do not enter spaces between the hyphens or commas.

### Default

The default is that ingress filtering is off and all frame types are classified and accepted.

### Command Mode

Interface mode

### Examples

```
#configure terminal
(config)#interface eth0
(config-if)#switchport trunk native vlan 2

(config)#interface eth0
(config-if)#no switchport trunk native vlan
```

---

## switchport mode private-vlan

Use this command to make a layer2 port as a host port or promiscuous port.

Use the `no` form of this command to remove the configuration.

### Command Syntax

```
switchport mode private-vlan (host | promiscuous)
no switchport mode private-vlan (host | promiscuous)
```

### Parameters

host	This port type can communicate with all other host ports assigned to the same community VLAN, but it cannot communicate with the ports in the same isolated VLAN. All communications outside of this VLAN must pass through a promiscuous port in the associated primary VLAN.
promiscuous	A promiscuous port can communicate with all interfaces, including the community and isolated ports within a private VLAN

### Command Mode

Interface mode

### Example

```
#configure terminal
(config)#interface eth0
(config-if)#switchport mode private-vlan host
(config)#interface eth1
(config-if)#switchport mode private-vlan promiscuous
(config)#interface eth2
(config-if)#no switchport mode private-vlan promiscuous
```



---

## switchport private-vlan host-association

Use this command to associate a primary VLAN and a secondary VLAN to a host port. Only one primary and secondary VLAN can be associated to a host port.

Use the `no` form of this command to remove the association.

### Command Syntax

```
switchport private-vlan host-association <2-4094> add <2-4094>
no switchport private-vlan host-association
```

### Parameters

<2-4094>	VLAN identifier of the primary VLAN.
add	Adds the secondary VLAN.
<2-4094>	VLAN identifier of the secondary VLAN (either isolated or community).

### Command Mode

Interface mode

### Example

```
#configure terminal
(config)#interface eth0
(config-if)#switchport private-vlan host-association 2 add 3

#configure terminal
(config)#interface eth0
(config-if)#no switchport private-vlan host-association
```

---

## switchport private-vlan mapping

Use this command to associate a primary VLAN and a set of secondary VLANs to a promiscuous port.

Use the `no` form of this to remove all the association of secondary VLANs to primary VLANs for a promiscuous port.

### Command Syntax

```
switchport private-vlan mapping <2-4094> add VLAN_ID
switchport private-vlan mapping <2-4094> remove VLAN_ID
no switchport private-vlan mapping
```

### Parameters

<2-4094>	VLAN identifier of the primary VLAN.
add	Adds the secondary VLAN.
remove	Removes the secondary VLAN.
VLAN_ID	VLAN identifier <2-4094> of the secondary VLAN (either isolated or community).

### Command Mode

Interface mode

### Example

```
#configure terminal
(config)#interface eth0
(config-if)#switchport private-vlan mapping 2 add 3-4
(config-if)#switchport private-vlan mapping 2 remove 3-4

(config-if)#no switchport private-vlan mapping
```

---

## vlan bridge allowed

Use this command to add or delete interfaces to the VLAN list. You can specify entries as multicast.

Use the `no` parameter with this command to undo this configuration.

### Command Syntax

```
vlan <2-4094> bridge (<1-32>|)allowed (multicast|) (add|remove) interface IFNAME
no vlan <2-4094> bridge <1-32>
```

### Parameters

<code>&lt;2-4094&gt;</code>	The VID of the VLAN <2-4094>
<code>bridge</code>	Specify the bridge group ID as a range <1-32> or as
<code>add</code>	Add the interface in the VLAN list
<code>multicast</code>	Specifies the entry as a multicast
<code>remove</code>	Deletes the interface from the vlan list
<code>interface</code>	Interface information

### Command Mode

VLAN Configuration mode

### Example

```
#configure terminal
(config)#vlan database
(config-vlan)#vlan 12 bridge 15 allowed multicast add interface eth1
```

---

## vlan classifier group

Use this command to create a subnet-based VLAN classifier group. A group indicates a VLAN classifier group ID.

### Command Syntax

```
vlan classifier group <1-16> (add | delete) rule <1-256>
no vlan classifier group <1-16>
```

### Parameters

add	Adds a rule to a group.
delete	Deletes a rule from a group.
rule	Indicates the VLAN classifier rule identifier <1-256>.

### Command Mode

Configure mode

### Command Example

```
#configure terminal
(config)#vlan classifier group 1 delete rule 1
(config)#no vlan classifier group 2
```

---

## vlan classifier rule ipv4

Use this command to create a subnet-based VLAN classifier rule and map it to a specific VLAN. If the source IP address matches the IP subnet specified in the VLAN classifier rule, received packets are mapped to the designated VLAN.

### Command Syntax

```
vlan classifier rule <1-256> ipv4 A.B.C.D/M vlan <2-4094>
no vlan classifier rule <1-256>
```

### Parameters

A.B.C.D/M	Indicates the IPv4 address classification. Enter the address in A.B.C.D/M format.
vlan	Indicates the VLAN to which an untagged packet is mapped <2-4094>.

### Command Mode

Configure mode

### Command Example

```
#configure terminal
(config)#vlan classifier rule 2 ipv4 20.20.20.2/24 vlan 2
(config)#no vlan classifier rule 2
```

---

## vlan classifier rule mac

Use this command to create a subnet-based VLAN classifier rule and map it to a specific VLAN.

If the source IP address matches the IP subnet specified in the VLAN classifier rule, received packets are mapped to the designated VLAN.

### Command Syntax

```
vlan classifier rule <1-256> mac WORD vlan <2-4094>
no vlan classifier rule <1-256>
```

### Parameters

WORD	Indicate the Mac address classification. Enter the address in HHHH.HHHH.HHHH format.
vlan	Indicates the VLAN to which an untagged packet is mapped <2-4094>.

### Command Mode

Configure mode

### Command Example

```
#configure terminal
(config)#vlan classifier rule 2 mac fe80::22e::b5ff:fee8:6/64 vlan 2
(config)#no vlan classifier rule 2
```

## vlan classifier rule proto

Use this command to create a subnet-based VLAN classifier rule for a protocol and map it to a specific VLAN. If the source IP address matches the IP subnet specified in the VLAN classifier rule, received packets are mapped to the designated VLAN.

### Command Syntax

```
vlan classifier rule <1-256> proto (ip|ipv6|ipx|x25|arp|rarp|atalkddp|atalkaarp|
  atmmulti|atmtransport|pppdiscovery|pppsession|xeroxpup|xeroxaddrtrans|g8bpqx25|
  ieee8023pup|ieee8023pup|dec|decnadmload|decnadmremoteconsole|decnadmrouting|
  declat|decdiagnostics|deccustom|decsyscomm|<0-65535>) encap (ethv2|snapllc|
  nosnapllc) (vlan <2-4094>|)

no vlan classifier rule <1-256>
```

### Parameters

<0-65535>	Ethernet decimal
arp	Address Resolution Protocol
atalkaarp	Appletalk AARP
atalkddp	Appletalk DDP
atmmulti	MultiProtocol Over ATM
atmtransport	Frame-based ATM Transport
dec	DEC Assigned
deccustom	DEC Customer use
decdiagnostics	EC Diagnostics
decnadmload	DEC DNA Dump/Load
decnadmremoteconsole	DEC DNA Remote Console
decnadmrouting	DEC DNA Routing
declat	DEC LAT
decsyscomm	DEC Systems Comms Arch
g8bpqx25	G8BPQ AX.25
ieee8023pup	Xerox IEEE802.3 PUP Address Translation
ieee8023pup	Xerox IEEE802.3 PUP
ip	IP address
ipv6	IPv6 address
ipx	IPX address
pppdiscovery	PPPoE discovery
pppsession	PPPoE session
rarp	Reverse Address Resolution
x25	CCITT X.25
xeroxaddrtrans	Xerox PUP Address Translation

xeroxpup	Xerox PUP
encap	Specify packet encapsulation
ethv2	Ethernet v2
nosnapllc	Indicates LLC without snap encapsulation
snapllc	Indicates LLC snap encapsulation
vlan	Indicates the VLAN to which an untagged packet is mapped <2-4094>.

### Command Mode

Configure mode

### Command Example

```
#configure terminal
(config)#vlan classifier rule 2 proto ip encap ethv2 vlan 2
(config)#no vlan classifier rule 2
```



---

## vlan database

Use this command to enter the VLAN configuration mode to add, delete, or modify values associated with a single VLAN.

### Command Syntax

```
vlan database
```

### Parameters

None

### Command Mode

Configure mode

### Example

In the following example, note the change to VLAN configuration mode from Configure mode:

```
#configure terminal
(config)#vlan database
(config-vlan)#
```

---

## vlan bridge forbidden

Use this command to add or delete interfaces to the VLAN forbidden list. You can specify entries as multicast.

Use the `no` parameter with this command to undo this configuration.

### Command Syntax

```
vlan <2-4094> bridge (<1-32>|) forbidden (multicast|) (add|remove) interface IFNAME
no vlan <2-4094> bridge <1-32>
```

### Parameters

<2-4094>	The VID of the VLAN <2-4094>.
bridge	Specify the bridge group ID in the range of <1-32> or as.
add	Add the interface in the VLAN list
multicast	Specifies the entry as a multicast
remove	Deletes the interface from the vlan list
interface	Interface information

### Examples

```
#configure terminal
(config)#vlan database
(config-vlan)#vlan 12 bridge 15 forbidden multicast add interface eth1
```

---

## vlan mtu

Use this command to set the Maximum Transmission Unit (MTU) for a specified VLAN. Any packet with a size greater than the configured MTU is discarded.

Use the `no` parameter to reset the MTU configuration for the VLAN.

### Command Syntax

```
vlan <2-4094> mtu MTU_VAL
vlan <2-4094> mtu MTU_VAL bridge <1-32>
no vlan <2-4094> mtu
no vlan <2-4094> mtu bridge <1-32>
```

### Parameters

mtu	The value of the Maximum Transmission Unit.
bridge	Specify the bridge group ID.

### Command Mode

VLAN Configuration mode

### Examples

```
#configure terminal
(config)#vlan database
(config-database)#vlan 2 mtu 1000 bridge 1
```

---

## vlan name

This command enables or disables the name of a particular VLAN on the bridge.

Note: Default bridge is not supported for hardware platforms.

### Command Syntax

```
vlan <2-4094> name WORD (state (enable|disable)) (for default bridge)
vlan <2-4094> bridge <1-32> name WORD (state (enable|disable))
```

### Parameters

<1-32>	Specify bridge group ID
state	Indicates the operational state of the VLAN
enable	Sets VLAN into a enable state.
disable	Sets VLAN into a disable state.

### Command Mode

VLAN Configuration mode

### Examples

```
#configure terminal
(config)#vlan database
(config-vlan)#vlan 45 name vlan2 state enable (for default bridge)
(config-vlan)#vlan 45 bridge 1 name vlan2 state enable
```

---

## vlan state

This command enables or disables the state of a particular VLAN on the bridge.

Note: Default bridge is not supported for hardware platforms.

### Command Syntax

```
vlan <2-4094> name WORD (state (enable|disable)) (for default bridge)
vlan <2-4094> bridge <1-32> name WORD (state (enable|disable))
```

### Parameters

<1-32>	Specify bridge group ID
state	Indicates the operational state of the VLAN
enable	Sets VLAN into a enable state.
disable	Sets VLAN into a disable state.

### Command Mode

VLAN Configuration mode

### Examples

```
#configure terminal
(config)#vlan database
(config-vlan)#vlan 45 name vlan2 state enable (for default bridge)
(config-vlan)#vlan 45 bridge 1 name vlan2 state enable
```

---

## vlan type

This command enables or disables forwarding over a VLAN on a BEB B-component. and sets its type.

Use the `no` form of this command to remove the VLAN from the BEB B-component.

### Command Syntax

```
vlan <2-4094> type service ((point-point | multipoint-multipoint | rooted-  
multipoint) (name WORD|)) (state (enable | disable)|)  
no vlan <2-4094> type service
```

### Parameters

<2-4094>	VLAN identifier
point-point	Sets the VLAN connectivity mode to point-to-point
multipoint-multipoint	Sets the VLAN connectivity mode to multipoint-multipoint
rooted-multipoint	Sets the VLAN connectivity mode to rooted-multipoint
WORD	The name of the VLAN. The maximum length is 16 characters.
enable	Allows forward over the VLAN
disable	Stops forwarding over the VLAN

### Command Mode

VLAN Configuration mode

### Examples

```
#configure terminal  
(config)#vlan database  
(config-vlan)#vlan 45 type service point-point name vlan45 state enable
```

---

## vlan type customer

This command enables or disables the state of a particular customer VLAN.

Use the `no` form of this command to remove the VLAN type.

### Command Syntax

```
vlan <2-4094> type customer
vlan <2-4094> type customer bridge <1-32>
vlan <2-4094> type customer bridge <1-32> state (enable|disable)
vlan <2-4094> type customer bridge <1-32> name WORD (state (enable|disable) |)
vlan <2-4094> type customer mtu MTU_VAL
vlan <2-4094> type customer mtu MTU_VAL bridge <1-32>
vlan <2-4094> type customer name WORD (state (enable|disable) |)
vlan <2-4094> type customer state (enable|disable)
no vlan <2-4094> type customer
no vlan <2-4094> type customer bridge <1-32>
no vlan <2-4094> type customer mtu bridge <1-32>
```

### Parameters

<code>&lt;2-4094&gt;</code>	The VID of the VLAN that will be enabled or disabled on the bridge <code>&lt;2-4094&gt;</code> .
<code>type</code>	Identifies the VLAN as a customer, service, or VLAN.
<code>customer</code>	Identifies the Customer VLAN
<code>bridge</code>	Indicates a Service VLAN <code>&lt;1-32&gt;</code> .
<code>mtu</code>	Indicates an MTU Value.
<code>name</code>	The ASCII name of the VLAN. Maximum length allowed is 16 characters.
<code>state</code>	Indicates the operational state of the VLAN.
<code>enable</code>	Sets VLAN into an enable state.
<code>disable</code>	Sets VLAN into a disable state.

### Command Mode

VLAN Configuration mode

### Examples

```
#configure terminal
(config)#vlan database
(config-vlan)#vlan 12 type customer bridge 1 name new state enable
```

---

## vlan type service

This command enables or disables the state of a particular service VLAN. A service identifies a bridge instance as a B-component.

Use the `no` form of this command to remove the VLAN type.

### Command Syntax

```
vlan <2-4094> type service mtu MTU_VAL
vlan <2-4094> type service mtu MTU_VAL bridge <1-32>
vlan <2-4094> type service (point-point|multipoint-multipoint|rooted-multipoint)
vlan <2-4094> type service (point-point|multipoint-multipoint|rooted-multipoint)
    bridge <1-32>
vlan <2-4094> type service (point-point|multipoint-multipoint|rooted-multipoint)
    bridge <1-32> name WORD (state (enable|disable)|)
vlan <2-4094> type service (point-point|multipoint-multipoint|rooted-multipoint)
    bridge <1-32> state (enable|disable)
vlan <2-4094> type service ((point-point | multipoint-multipoint|rooted-multipoint)
    (name WORD|)) (state (enable | disable)|)
vlan <2-4094> type service (point-point|multipoint-multipoint|rooted-multipoint)
    state (enable|disable)
no vlan <2-4094> type service
no vlan <2-4094> type service bridge <1-32>
no vlan <2-4094> type service mtu
no vlan <2-4094> type service mtu bridge <1-32>
```

### Parameters

mtu	Sets the service VLAN connectivity mode to an MTU value.
point-point	Sets the VLAN connectivity mode to point-to-point
multipoint-multipoint	Sets the VLAN connectivity mode to multipoint-multipoint
rooted-multipoint	Sets the VLAN connectivity mode to rooted-multipoint
name	The ASCII name of the VLAN. Maximum length allowed is 16 characters
state	Indicates the operational state of the VLAN.
enable	Sets VLAN into an enable state.
disable	Sets VLAN into a disable state.

### Command Mode

VLAN Configuration mode



**Examples**

```
#configure terminal
(config)#vlan database
(config-vlan)#vlan 12 type service multipoint-multipoint bridge 23 state
enable
```

---

## **vlan VLAN\_RANGE bridge**

.This command allows you to create a single/range of VLAN's on the VLAN aware bridges.

Use the no form of this command to delete the VLAN.

### **Command Syntax**

```
vlan VLAN_RANGE
vlan VLAN_RANGE state (enable | disable)
vlan VLAN_RANGE bridge <1-32>
vlan VLAN_RANGE state bridge <1-32>(enable | disable)
no vlan VLAN_RANGE
no vlan VLAN_RANGE bridge <1-32>
```

### **Parameters**

VLAN_RANGE	The vlan-id or range of vlan-id's separated by ','&'-'
bridge	Specify the bridge group ID in the range 1-32.
state	Indicates the operational state of the VLAN.
enable	Sets VLAN into an enable state.
disable	Sets VLAN into a disable state.

### **Command Mode**

Configuration Mode

### **Examples**

```
(config)#vlan 3-40,56 bridge 4 state disable
(config)#no vlan 2-5 bridge 2
```

---

## vlan VLAN\_RANGE provider/edge bridge

This command allows you to create a single/range of VLAN's on provide/edge bridge.

Use the no form of this command to delete the VLAN.

Note: PBB is not supported on hardware platforms.

### Command Syntax

```
vlan VLAN_RANGE type customer
vlan VLAN_RANGE type customer state (enable | disable)
vlan VLAN_RANGE type service (point-point | multipoint-multipoint | rooted-
multipoint))
vlan VLAN_RANGE type service (point-point | multipoint-multipoint | rooted-
multipoint) state (enable | disable)

vlan VLAN_RANGE type customer bridge <1-32>
vlan VLAN_RANGE type customer bridge <1-32> state (enable | disable)
vlan VLAN_RANGE type service (point-point | multipoint-multipoint | rooted-
multipoint) bridge <1-32>
vlan VLAN_RANGE type service (point-point | multipoint-multipoint | rooted-
multipoint) bridge <1-32> state (enable | disable)

no vlan VLAN_RANGE type customer
no vlan VLAN_RANGE type service
no vlan VLAN_RANGE type customer bridge <1-32>
no vlan VLAN_RANGE type service bridge <1-32>
```

### Parameters

VLAN_RANGE	The vlan-id or range of vlan-id's separated by ','&'-'
type	Identifies the VLAN as a customer, service, or VLAN.
customer	Identifies the Customer VLAN
bridge	Specify the bridge group ID in the range 1-32.
name	The ASCII name of the VLAN. Maximum length allowed is 16 characters.
state	Indicates the operational state of the VLAN.
enable	Sets VLAN into an enable state.
disable	Sets VLAN into a disable state.
point-point	Sets the VLAN connectivity mode to point-to-point
multipoint-multipoint	Sets the VLAN connectivity mode to multipoint-multipoint
rooted-multipoint	

Sets the VLAN connectivity mode to rooted-multipoint

### **Command Mode**

Configuration Mode

### **Examples**

```
(config)vlan 2,4,5-6 customer bridge 2
(config)vlan 10-12 service type point-point bridge 3 state disable
```

---

## vlan VLAN\_RANGE backbone

This command allows you to create a single/range of VLAN's on backbone bridge.

Use the no form of this command to delete the VLAN.

Note: PBB is not supported on hardware platforms.

### Command Syntax

```
vlan VLAN_RANGE type backbone (point-point | multipoint-multipoint |
    rootedmultipoint)
vlan VLAN_RANGE type backbone (point-point | multipoint-multipoint |
    rootedmultipoint) state (enable | disable)
no vlan VLAN_RANGE type backbone
```

### Parameters

VLAN_RANGE	The vlan-id or range of vlan-id's separated by ','&'-'
type	Identifies the VLAN as a customer, service, or VLAN.
state	Indicates the operational state of the VLAN.
enable	Sets VLAN into an enable state.
disable	Sets VLAN into a disable state.

### Command Mode

Configure mode

### Examples

(config)#vlan 3,4-9 bridge 1 type backbone point-point state enable



## Appendix A    spanning-tree Commands

The following lists the spanning-tree command aliases for the ZebOS-XP `bridge` and `bridge-group` commands which only apply to default bridges. Default bridges are only supported for the Linux software forwarder.

- `spanning-tree ageing-time <10-1000000>`
- `no spanning-tree ageing-time`
- `spanning-tree cisco-interoperability (enable | disable)`
- `spanning-tree enable`
- `spanning-tree errdisable-timeout enable`
- `no spanning-tree errdisable-timeout enable`
- `spanning-tree errdisable-timeout interval <10-1000000>`
- `no spanning-tree errdisable-timeout interval`
- `spanning-tree force-version <0-3>`
- `no spanning-tree force-version`
- `spanning-tree forward-time <4-30>`
- `no spanning-tree forward-time`
- `spanning-tree hello-time <1-10>`
- `no spanning-tree hello-time`
- `spanning-tree instance <1-63>`
- `no spanning-tree instance <1-63>`
- `spanning-tree instance <1-63> path-cost <1-200000000>`
- `no spanning-tree instance <1-63> path-cost`
- `spanning-tree instance <1-63> priority <0-240>`
- `spanning-tree instance <1-63> priority <0-61440>`
- `no spanning-tree instance <1-63> priority`
- `spanning-tree max-age <6-40>`
- `no spanning-tree max-age`
- `spanning-tree max-hops <1-40>`
- `no spanning-tree max-hops <1-40>`
- `spanning-tree path-cost <1-200000000>`
- `no spanning-tree path-cost`
- `spanning-tree portfast bpdu-filter`
- `no spanning-tree portfast bpdu-filter`
- `spanning-tree portfast bpdu-guard`
- `no spanning-tree portfast bpdu-guard`
- `spanning-tree priority <0-61440>`
- `no spanning-tree priority`

- spanning-tree shutdown
- no spanning-tree shutdown
- spanning-tree transmit-holdcount <1-10>
- no spanning-tree transmit-holdcount
- spanning-tree vlan <2-4094>
- no spanning-tree vlan <2-4094>
- spanning-tree vlan <2-4094> path-cost <1-200000000>
- no spanning-tree vlan <2-4094> path-cost
- spanning-tree vlan <2-4094> priority <0-240>
- spanning-tree vlan <2-4094> priority <0-61440>
- no spanning-tree vlan <2-4094> priority



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---

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