



ZebOS-XP®

Network Platform

Version 1.4
Extended Performance

Carrier Ethernet
Command Reference

December 2015

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Preface

This document describes the ZebOS-XP commands for Carrier Ethernet.

Audience

This document is intended for network administrators and other engineering professionals who configure and manage Carrier Ethernet.

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, Ethernet CFM Commands](#)
- [Chapter 3, EFM OAM Commands](#)
- [Chapter 4, Link Layer Discovery Protocol Commands](#)
- [Chapter 5, Link Layer Discovery Protocol v2 Commands](#)
- [Chapter 6, MEF User Network Interface Commands](#)
- [Chapter 7, MEF-ENNI Commands](#)
- [Chapter 8, Provider Bridging Commands](#)
- [Chapter 9, Provider Backbone Bridging Commands](#)
- [Chapter 10, Provider Backbone Bridging CFM Commands](#)
- [Chapter 11, PBB-TE Provisioning Commands](#)
- [Chapter 12, PBB-TE CFM Commands](#)
- [Chapter 13, PBB-TE Measurement Commands](#)

- [Chapter 14, PBB-TE APS Commands](#)
- [Chapter 15, PBB-TE Force Commands](#)
- [Chapter 16, Ethernet Protection Switching Commands](#)
- [Chapter 17, G.8032 ERPS Version 1 Commands](#)
- [Chapter 18, G.8032 ERPS Version 2 Commands](#)
- [Appendix A, CFM Version 1 Commands](#)

Related Documents

The following guides are related to this document:

- *Carrier Ethernet Configuration Guide*

Note: All ZebOS-XP technical manuals are available to licensed customers at 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 ethernet oam eth1</code>
lowercase	Keywords that you enter exactly as shown in the command syntax.	<code>show ethernet oam eth1</code>
UPPERCASE	See Variable Placeholders	<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 <0-4294967295>)</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 <0-4294967295>)</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 <1-255> inter-area <1-255> external <1-255>}</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>[<1-65535> 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 .<1-65535></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
Command Name	The name of the command, followed by what the command does and when should it be used
Command Syntax	The syntax of the command
Parameters	Parameters and options for the command
Default	The state before the command is executed
Command Mode	The mode in which the command runs; see Command Modes
Example	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.

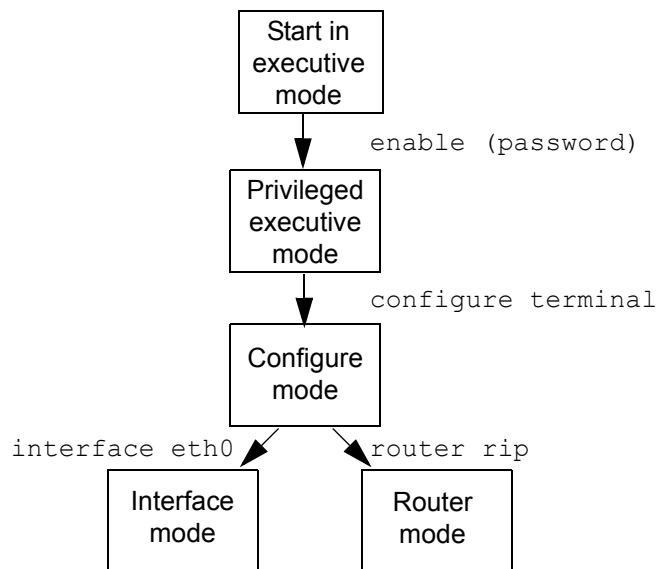


Figure 1-1: Common command modes

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 Ethernet CFM Commands

This chapter describes the commands used to manage the Connectivity Fault Management (CFM). CFM refers to the service OAM of Ethernet used to manage individual Layer 2 Ethernet services. The CFM protocol can discover and verify the path through 802.1 bridges and LANs. ZebOS-XP adheres to the IEEE 802.1ag 2007 standard.

CFM can operate over LAN segments, customer VLANs (C-VLANs), service VLANs (S-VLANs), backbone VLANs (B-VLANs) and backbone service instances identified by service instance IDs (I-SIDs). CFM maintenance domain end points (MEPs) and maintenance domain intermediate points (MIPs) can be inserted at any of the external network-to-network (E-NNI) service interfaces.

CFM modules include the features required by ITU Y.1731 standard *OAM Functions and Mechanisms for Ethernet Based Networks*. This recommendation identifies the functions required to enable fault management (such as fault localization and defect detection) and performance monitoring (such as error counts and delay measurements) in an Ethernet network.

- [1dm](#) on page 27
- [1dm receive](#) on page 28
- [add vid](#) on page 29
- [ais interval](#) on page 30
- [ais status](#) on page 31
- [cc](#) on page 32
- [cc interval](#) on page 33
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- [show ethernet cfm maintenance-points local](#) on page 84
- [show ethernet cfm maintenance-points remote](#) on page 85
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- [vsm tx](#) on page 93

1dm

Use this command to configure one-way delay measurement (1DM) for a MEP.

Command Syntax

```
1dm (unicast (rmpid MEPID)|multicast) duration DURATION ((interval (1 | 2 | 3 | 4)) |)
```

Parameters

unicast	Specify the unicast delay measurement.
rmpid	Specify the MEPID of remote MEP.
multicast	Specify the multicast delay measurement.
duration	Specify an integer that sets the delay measurement duration <5-60>.
interval	Specify a DMM transmission interval.
1	Specify a DM Transmission interval <100 ms>.
2	Specify a DM Transmission interval <10 ms>.
3	Specify a DM Transmission interval <1 second>.
4	Specify a DM Transmission interval <10 seconds>.

Command Mode

Ethernet CFM MEP configuration mode

Example

```
(config-cfm-mep)#1dm unicast rmpid 1 duration 1
```

1dm receive

Use this command to configure reception of one-way delay measurement (1DM) frames for a MEP and set the duration.

Command Syntax

```
1dm receive duration DURATION
```

Parameters

`duration` Specify an integer in the range of <5-60> that sets the delay measurement duration.

Command Mode

Ethernet CFM MEP configuration mode

Example

```
(config-cfm-mep)#1dm receive duration 7
```

add vid

Use this command to add a VLAN as a secondary. A secondary VLAN is required because CFM frames can be received by a secondary VLAN, but cannot be sent from one. CFM frames can only be sent from primary VLANs.

Command Syntax

```
add vid VID ((bridge <1-32>| backbone) |)
```

Parameters

vid	VLAN.
VID	VLAN ID.
bridge	Bridge.
<1-32>	Bridge ID.
backbone	Backbone bridge.

Command Mode

Configure CFM VLAN mode

Example

```
(config)#ethernet cfm configure vlan 3 bridge 1
(config-cfm-vlan)#add vid 4 bridge 1
```

ais interval

Use this command to set the transmission interval between Alarm Indicator Signal (AIS) frames for a MEP.

An internal counter is maintained for the number of AIS instances running. The maximum value of this counter is fixed at eight.

Command Syntax

```
ais interval TX_INTERVAL
```

Parameters

`interval` Set the transmission interval for AIS in seconds.

`TX_INTERVAL` Enter 1 or 60 seconds for the transmission interval.

Command Mode

Ethernet CFM MEP configuration mode

Example

```
(config-cfm-mep)#ais interval 10
```

ais status

Use this command to enable or disable Alarm Indicator Signal (AIS) frame transmission for a MEP. AIS frames are triggered by Ethernet down events.

An internal counter is maintained for each AIS instance that is running. The maximum number of instances supported is eight.

Command Syntax

```
ais status (enable | disable) (all | loc | mismerge | unexpected-mep | unexpected-
meg-level | unexpected-period) level <1-7> (unicast RMEP_MAC | multicast)
```

Parameters

enable	Enable AIS frame monitoring.
disable	Disable AIS frame monitoring.
all	Specify AIS for all defect conditions.
loc	Specify AIS for loss of continuity.
mismerge	Specify AIS for incorrect MEG ID.
unexpected-mep	Specify AIS for unexpected MEP ID received.
unexpected-meg-level	Specify AIS for incorrect MEG level.
unexpected-period	Specify AIS for mis-matched in period received.
level	Specify the level for AIS transmission.
unicast	Specify the unicast ais frame to be sent
RMEP_MAC	Specify a remote MEP MAC address in the format HHHH.HHHH.HHHH.
multicast	Specify the multicast ais frame to be sent

Command Mode

Interface mode

ExampleS

This example enables AIS for unicast frames at the specified MAC address at level 3:

```
#configure terminal
(config)#interface eth1
(config-if)#ethernet cfm mep down mpid 23 active true domain abc vlan 3 bridge
1
(config-if-eth-cfm-mep)#ais status enable all unicast 2222.1111.432a
```

CC

Use this command to enable or disable continuity checking (CC) messaging.

Command Syntax

```
cc enable level <0-7>
cc disable level <0-7>
```

Parameters

enable	Enable CC.
disable	Disable CC.
<0-7>	Specify the level at which CC messages are sent

Command Mode

Interface Ethernet CFM MEP configuration mode

Examples

```
#configure terminal
(config)#interface eth1
(config-if)#ethernet cfm mep down mpid 23 active true domain abc vlan 3 bridge
1
(config-if-eth-cfm-mep)#cc enable 4
...
(config-if-eth-cfm-mep)#cc disable 4
```

cc interval

Use this command to set the continuity checking (CC) interval.

Command Syntax

```
cc (vlan VLAN_ID|) (interval (1 | 2 | 3 | 4 | 5 | 6 | 7)) (bridge <1-32>|)
```

Parameters

vlan	VLAN ID.
interval	The CC interval:
1	3 milliseconds.
2	10 milliseconds.
3	100 milliseconds.
4	1 seconds.
5	10 seconds.
6	1 minute.
7	10 minutes.
bridge	Bridge ID.

Command Mode

Ethernet CFM configuration mode

Examples

```
(config-ether-cfm)#cc vlan 5 interval 4 bridge 16
```

cc multicast

Use this command to start or stop multicast continuity checking (CC) messaging on a MEP.

Command Syntax

```
cc multicast state (enable|disable)
```

Parameters

state	Specify to either enable or disable CFM multicast CC.
enable	Start sending periodic multicast frames.
disable	Stop sending multicast frames.

Command Mode

Interface Ethernet CFM MEP configuration mode

Examples

```
#configure terminal
(config)#interface eth1
(config-if)#ethernet cfm mep down mpid 23 active true domain abc vlan 3 bridge
1
(config-if-eth-cfm-mep)#cc multicast state enable
...
(config-if-eth-cfm-mep)#cc multicast state disable
```

cc unicast

Use this command to start or stop unicast continuity checking (CC) messaging between a host MEP and a remote MEP.

Command Syntax

```
cc unicast rmpid RMEPID state (enable|disable)
```

Parameters

state	Specify to either enable or disable CFM unicast CC.
enable	Start sending periodic unicast frames.
disable	Stop sending unicast frames.
rmpid	The remote MEP.
RMEPID	Remote MEP ID

Command Mode

Interface Ethernet CFM MEP configuration mode

Examples

```
#configure terminal
(config)#interface eth1
(config-if)#ethernet cfm mep down mpid 23 active true domain abc vlan 3 bridge
1
(config-if-eth-cfm-mep)#cc unicast rmpid 29 state enable
...
(config-if-eth-cfm-mep)#cc unicast rmpid 29 state disable
```

clear

Use this command to clear one or more or all attribute values for a link-level MEP. When an attribute is cleared, it is reset to its default value.

Command Syntax

```
clear (ccm-ltm-priority | lowest-priority-defect | fng-alarm-time | reset-fng-time
| active | tx-lbm-status | tx-lbm-destination-mac | tx-lbm-destination-mepid |
tx-lbm-destination-is-mepid | tx-lbm-messages | tx-lbm-data-tlv | tx-lbm-vlan-
priority | tx-lbm-vlan-drop-enable | tx-lbm-time-out-value | ccm-ltm-flags | tx-
ltm-target-mac | tx-ltm-target-mepid | tx-ltm-target-is-mepid | tx-ltm-ttl | tx-
ltm-egress-id | tx-lbr-time-out-value | all)
```

Parameters

ccm-ltm-priority	CCM linktrace message priority.
lowest-priority-defect	Lowest priority defect value.
fng-alarm-time	Time that the defect must be absent before alarm is cleared.
reset-fng-time	Reset FNG time.
active	Administrative state of the MEP.
tx-lbm-status	Transmit loopback message status.
tx-lbm-destination-mac	Destination MAC address for LBM
tx-lbm-destination-mepid	ID of the transmit LBM destination MEP.
tx-lbm-destination-is-mepid	Transmit LBM destination is the same as the source MEP.
tx-lbm-messages	Transmit LBM.
tx-lbm-data-tlv	The transmit LBM data TLV.
tx-lbm-vlan-priority	Transmit LBM VLAN priority.
tx-lbm-vlan-drop-enable	Enable drop for transmit LBM on this VLAN.
tx-lbm-time-out-value	Loopback message timeout.
ccm-ltm-flags	Transmit LTM Target MAC Address.

<code>tx-ltm-target-mac</code>	MAC address of target MEP for LTM transmission.
<code>tx-ltm-target-mepid</code>	ID of target MEP for LTM transmission.
<code>tx-ltm-target-is-mepid</code>	LTM transmission target MEP ID is the same as the source MEP.
<code>tx-ltm-ttl</code>	TTL value for LTM transmission.
<code>tx-ltm-egress-id</code>	Transmit LTM egress ID.
<code>tx-lbr-time-out-value</code>	Loopback reception timeout.
<code>all</code>	All attributes

Command Mode

Interface mode

Examples

```
#configure terminal
(config)#interface eth1
(config-if)#ethernet cfm mep down mpid 23 active true domain abc vlan 3 bridge
1
(config-if-eth-cfm-mep)#clear all
(config-if-eth-cfm-mep)#clear active
```

clear ethernet cfm errors

Use this command to clear the CFM errors logged in a domain at a particular level, or on a bridge.

Command Syntax

```
clear ethernet cfm errors (domain DOMAIN_NAME|level LEVEL_ID) (bridge <1-32>|)
```

Parameters

domain	Specify a maintenance domain name.
DOMAIN_NAME	Specify a maintenance domain name.
level	Specify a maintenance level.
LEVEL_ID	Specify a maintenance level <0-7>.
bridge	Bridge.
<1-32>	Bridge ID.

Command Mode

Exec Mode and Privileged Exec Mode

Example

```
>clear ethernet cfm errors level 3 bridge 1
```

clear ethernet cfm maintenance-points

Use this command to clear CFM maintenance point information in a remote domain or at a remote level.

Command Syntax

```
clear ethernet cfm maintenance-points remote (domain DOMAIN_NAME|level LEVEL_ID)
    (bridge <1-32>|)
```

Parameters

domain	Specify a maintenance domain name.
DOMAIN_NAME	Specify a maintenance domain name.
level	Specify a maintenance level.
LEVEL_ID	Specify a maintenance level <0-7>.
bridge	Bridge.
<1-32>	Bridge ID.

Command Mode

Exec Mode and Privileged Exec Mode

Example

```
>clear ethernet cfm maintenance-points remote level 7 bridge 1
```

clear ethernet cfm traceroute-cache

Use this command to clear the CFM errors logged in a named domain or on a targeted device.

Command Syntax

```
clear ethernet cfm traceroute-cache (bridge <1-32>|)
```

Parameter

bridge	Bridge.
<1-32>	Bridge ID.

Command Mode

Exec Mode and Privileged Exec Mode

Example

```
>clear ethernet cfm traceroute-cache bridge 1
```

delete vid bridge

Use this command to delete a secondary VID from a bridge.

Command Syntax

```
delete vid VID ((bridge <1-32>| backbone) |)
```

Parameters

vid	VLAN.
VID	VLAN ID.
bridge	Bridge.
<1-32>	Bridge ID.
backbone	Backbone bridge.

Command Mode

Configure CFM VLAN mode

Example

```
(config)#ethernet cfm configure vlan 3 bridge 1  
(config-cfm-vlan)#delete vid 4 bridge 1
```

dmm

Use this command to configure two-way delay measurement (DMM) for a MEP.

Command Syntax

```
dmm (unicast (rmpid MEPID) | multicast) duration DURATION ((interval (1 | 2 | 3 | 4)) | )
```

Parameters

unicast	Specify the unicast delay measurement.
rmpid	Specify the MEPID of remote MEP.
multicast	Specify the multicast delay measurement.
duration	Specify an integer that sets the delay measurement duration <5-60>.
interval	Specify a DMM transmission interval.
1	Specify a DM Transmission interval <100 ms>.
2	Specify a DM Transmission interval <10 ms>.
3	Specify a DM Transmission interval <1 second>.
4	Specify a DM Transmission interval <10 seconds>.

Command Mode

Ethernet CFM MEP configuration mode

Example

```
(config-cfm-mep)#dmm multicast duration 12 interval 1
```

dvm

Use this command to configure delay variation measurement (DVM) for a MEP.

Command Syntax

```
dvm (unicast (rmpid MEPID)|multicast) duration DURATION ((interval (1 | 2 | 3 | 4)) |)
```

Parameters

unicast	Specify the unicast delay measurement.
rmpid	Specify the MEPID of remote MEP.
multicast	Specify the multicast delay measurement.
duration	Specify the DVM duration <5-60>.
interval	Specify a transmission interval.
1	100 ms>
2	10 ms>
3	1 second.
4	10 seconds.

Command Mode

Ethernet CFM MEP configuration mode

Example

```
(config-cfm-mep)#dvm multicast duration 12 interval 1
```

ethernet cfm automatic bridge

Use this command to automatically configure CFM on the given bridge. When you give this command, there is no need to configure a maintenance domain (MD), a maintenance association (MA), and maintenance end points (MEPs) for the VLANs/I-SIDs associated with the bridge.

Use the `no` form of this command to disable automatic configuration.

Command Syntax

```
ethernet cfm automatic bridge (<1-32> | backbone)
no ethernet cfm automatic bridge (<1-32> | backbone)
```

Parameters

bridge	Specify a bridge.
<1-32>	Specify a bridge identifier.
backbone	Backbone bridge.

Command Mode

Configure mode

Example

```
#configure terminal
(config)#ethernet cfm automatic bridge 1
```

ethernet cfm automatic mep

Use this command to go into Ethernet CFM MEP configuration mode where you can configure an automatic MEP.

Command Syntax

```
ethernet cfm automatic mep MEPID bridge (<1-32> | backbone)
```

Parameters

mep	Automatic CFM MEP.
MEPID	Specify the MEP identifier <1-1000>.
bridge	Specify a bridge.
<1-32>	Specify a bridge identifier.
backbone	Backbone bridge.

Command Mode

Configure mode

Example

```
#config terminal
#(config)interface eth1
#(config-if)ethernet cfm automatic mep 10 bridge
#(config-if-eth-cfm-mep)
```

ethernet cfm configure default-md-level

Use this command to set the default MD level values for all subsequent entries in the default MD level table. When an entry is not explicitly configured with other values, it inherits the Level and MIP creation permission values from this object. The default level is 0, and the default MIP creation permission is none.

Command Syntax

```
ethernet cfm configure default-md-level level LEVEL
mip-creation (none|default|explicit) ((bridge <1-32> | backbone)|)
```

Parameters

level	Specify the level of this default-md-level.
LEVEL	Specify the level of this default-md-level.
mip-creation	Specify a MIP creation permission value.
none	Specify that no MIP may be created for the VID.
default	Specify that a MIP can be created for a VID on the bridge.
explicit	Specify that a MIP can be created for the VID only on bridge ports through which the VID can pass.
bridge	Specify a bridge.
<1-32>	Specify a bridge ID.
backbone	Backbone bridge.

Command Mode

Configure mode

Example

```
#configure terminal
(config)#ethernet cfm configure default-md-level level 3 mip-creation default
bridge 1
```

ethernet cfm configure vlan

Use this command to add a secondary VLAN to the primary VLAN.

Command Syntax

```
ethernet cfm configure vlan PRIMARY_VID ((bridge <1-32>| backbone) |)
```

Parameters

vlan	Specify the VLAN.
PRIMARY_VID	Specify the VLAN ID.
bridge	Specify a bridge.
<1-32>	Specify a bridge ID.
backbone	Backbone bridge.

Command Mode

Configure mode

Example

```
#configure terminal
(config)#ethernet cfm configure vlan 3 bridge 1
(config-cfm-vlan)#
```

ethernet cfm debug

Use this command to set the debugging functions for CFM.

Use the `no` form of this command to disable CFM debugging.

Command Syntax

```
ethernet cfm debug (event|rx|tx|loopback|traceroute)
no ethernet cfm debug (event|rx|tx|loopback|traceroute)
```

Parameters

<code>event</code>	Enable or disable event debugging.
<code>loopback</code>	Enable or disable loopback debugging.
<code>rx</code>	Enable or disable RX debugging.
<code>traceroute</code>	Enable or disable traceroute debugging.
<code>tx</code>	Enable or disable TX debugging.

Command Mode

Exec mode and Privileged Exec mode

Example

```
#ethernet cfm debug traceroute
```

ethernet cfm default-domain-level

Use this command to set the default domain level that is used by automatic CFM.

Use the `no` form of this command to set the default domain level identifier to 4.

Command Syntax

```
ethernet cfm default-domain-level LEVEL bridge (<1-32> | backbone)
no ethernet cfm default-domain-level bridge (<1-32> | backbone)
```

Parameters

LEVEL	Specify the level <0-7>.
bridge	Specify a bridge.
<1-32>	Specify a bridge identifier.
backbone	Backbone bridge.

Command Mode

Configure mode

Example

```
#configure terminal
(config)#ethernet cfm default-domain-level 3 bridge 1
```

ethernet cfm default-md-level entry isid

Use this command to change or clear an Ethernet service instance ID (ISID) in the default MD level table or to modify MIP creation permissions.

Command Syntax

```
ethernet cfm default-md-level entry isid ISID level LEVEL
(mip-creation (none|default|explicit)|) backbone

ethernet cfm default-md-level entry isid ISID clear backbone
```

Parameters

isid	Ethernet service instance.
ISID	Specify the Ethernet service instance ID <1-16777214>.
level	Specify the level of this default-md-level.
LEVEL	Specify the level of this default-md-level.
mip-creation	Specify a MIP creation permission value.
none	Specify that no MIP may be created for the VID.
default	Specify that a MIP can be created for a VID on the bridge.
explicit	Specify that a MIP can be created for the VID only on bridge ports through which the VID can pass.
backbone	Specify the bridge as a backbone bridge.
clear	Reverts this ISID to its default values.

Command Mode

Configure mode

Examples

```
#configure terminal
(config)#ethernet cfm default-md-level entry isid 3 level 3 mip-creation
default backbone

(config)#ethernet cfm default-md-level entry isid 3 level 3 mip-creation none
backbone

(config)#ethernet cfm default-md-level entry isid 3 level 3 mip-creation
explicit backbone

#configure terminal
(config)#ethernet cfm default-md-level entry isid 3 clear backbone
```

ethernet cfm default-md-level entry vid

Use this command to modify an entry in the default MD level table or to modify the MIP creation permissions.

Command Syntax

```
ethernet cfm default-md-level entry vid VID level LEVEL
    (mip-creation (none|default|explicit) | ) ( (bridge <1-32>|backbone) | )
ethernet cfm default-md-level entry vid VID clear ( (bridge <1-32>|backbone) | )
```

Parameters

vid	Specify the VLAN.
VID	Specify the VLAN ID.
level	Specify the level of this default-md-level.
LEVEL	Specify the level of this default-md-level.
mip-creation	Specify a MIP creation permission value.
none	Specify that no MIP may be created for the VID.
default	Specify that a MIP can be created for a VID on the bridge.
explicit	Specify that a MIP can be created for the VID only on bridge ports through which the VID can pass.
bridge	Specify a bridge.
<1-32>	Specify a bridge ID.
backbone	Backbone bridge.
clear	Reverts this ISID to its default values.

Command Mode

Configure mode

Example

```
#configure terminal
(config)#ethernet cfm default-md-level entry vid 3 level 3 mip-creation
default bridge 1
(config)#ethernet cfm default-md-level entry vid 3 level 3 mip-creation none
bridge 1
(config)#ethernet cfm default-md-level entry vid 3 level 3 mip-creation
explicit bridge 1
#configure terminal
(config)#ethernet cfm default-md-level entry vid 3 clear bridge 1
```

ethernet cfm default-mepid

Use this command to set the default maintenance end point (MEP) identifier that is used by automatic CFM.

Use the `no` form of this command to set the default MEP identifier to 1.

Command Syntax

```
ethernet cfm default-mepid MEPID bridge (<1-32> | backbone)
no ethernet cfm default-mepid bridge (<1-32> | backbone)
```

Parameters

MEPID	Specify the default MEP identifier <1-1000>.
bridge	Specify a bridge.
<1-32>	Specify a bridge identifier.
backbone	Backbone bridge.

Command Mode

Configure mode

Example

```
#configure terminal
(config)#ethernet cfm default-mepid 5 bridge 1
```

ethernet cfm domain-name

Use this command to define a CFM domain at a particular level for a bridge.

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

Command Syntax

```
ethernet cfm domain-name type ((no-name name NO_NAME) | (dns-based name
    DOMAIN_NAME) | (character-string name DOMAIN_NAME))
    level LEVEL mip-creation (none|default|explicit) (bridge <1-32>|)

ethernet cfm domain-name type mac name DOMAIN_NAME level LEVEL mip-creation
    (none|default|explicit) (bridge <1-32>|)

ethernet cfm domain-name type itu-t name DOMAIN_NAME level LEVEL mip-creation
    (none|default|explicit) (bridge <1-32>|)

no ethernet cfm domain DOMAIN_NAME level LEVEL mip-creation (none|default|explicit)
    (bridge <1-32>|)
```

Parameters

<code>type</code>	Specify the name type.
<code>no-name name</code>	
	Specify the name type has no maintenance domain name.
<code>NO_NAME</code>	Enter the name.
<code>dns-based name</code>	
	Specify the name as domain-name based.
<code>DOMAIN_NAME</code>	
	Enter the domain name
<code>character-string name</code>	
	Specify the name as a character string.
<code>DOMAIN_NAME</code>	
	Enter the domain name
<code>mac name</code>	Specify the name as MAC address + 2-octet integer.
<code>DOMAIN_NAME</code>	
	Enter the domain name
<code>itut-t name</code>	Specify the name in ITU-T carrier code (ICC) format.
<code>DOMAIN_NAME</code>	
	Enter the domain name
<code>level</code>	Specify the level.
<code>LEVEL</code>	Specify the level <0-7>.
<code>mip-creation</code>	Specify a MIP creation permission value.
<code>none</code>	Specify that no MIP may be created for the VID.
<code>default</code>	Specify that a MIP can be created for a VID on the bridge.
<code>explicit</code>	Specify that a MIP can be created for the VID only on ports which the VID can pass.

bridge	Specify a bridge.
<1-32>	Specify a bridge ID.

Command Mode

Configure mode

Examples

```
(config)#ethernet cfm domain-name type character-string name abc level 3 mip-  
creation default bridge 1  
(config-ether-cfm)#
```

ethernet cfm enable

Use this command to enable CFM globally.

Command Syntax

```
ethernet cfm enable
```

Parameters

None

Command Mode

Configure mode

Example

```
#configure terminal
(config)#ethernet cfm enable
```

ethernet cfm lmm counter

Use this command to enable or disable a Loss Measurement Message (LMM) frame counter on a MEP. The LMM frame counter simulates the hardware level frame counter.

Command Syntax

```
ethernet cfm lmm counter (enable | disable) mep MEPID level LEVEL (vlan VLANID|)  
bridge <1-32>
```

Parameters

enable	Specify to Install the hardware counters for a MEP.
disable	Specify to de-install the hardware counters for a MEP.
mep	Host MEP.
MEPID	Specify the host MEP ID <1-8191>.
level	Specify the level of the domain.
LEVEL	Specify the level <0-7>.
vlan	Specify the VLAN.
VLAN_ID	Specify the VLAN ID.
bridge	Specify a bridge.
<1-32>	Specify a bridge ID.

Command Mode

Exec mode and Privileged Exec mode

Example

```
#ethernet cfm lmm counter enable mep 5 level 3 vlan 3 bridge 1  
#ethernet cfm lmm counter disable mep 5 level 3 vlan 3 bridge 1
```

ethernet cfm lmm frame count simulator

Use this command to start the frame counter simulator that simulates the hardware-level frame counter and is shared between all maintenance end points.

Command Syntax

```
ethernet cfm lmm frame count simulator (start | stop)
```

Parameters

start	Start the frame count simulator.
stop	Stop the frame count simulator.

Command Mode

Configure mode

Example

```
#configure terminal
(config)#ethernet cfm lmm frame count simulator start
(config)#ethernet cfm lmm frame count simulator stop
```

ethernet cfm mep

Use this command to create a MEP and set it to the up or down state. This command switches you into Ethernet CFM MEP configuration mode.

Note: To create a link-level MEP, do not enter a the `local-vid` parameter.

Use the `no` form of this command to delete a MEP.

Command Syntax

```
ethernet cfm mep (down|up) mpid MEPID active (true | false) domain DOMAIN_NAME
(vlan VLANID|) (local-vid VID|) (uni-mep|) (bridge <1-32>|)

no ethernet cfm mep (down|up) mpid MEPID domain DOMAIN_NAME (vlan VLANID|)
(local-vid VID|) (bridge <1-32>|)
```

Parameters

down	Specify a down MEP.
up	Specify an up MEP.
mep	Host MEP.
MEPID	Specify the host MEP ID <1-8191>.
active	Specify the administrative state of the MEP.
true	Set the state of the MEP to active.
false	Set the state of the MEP to inactive.
domain	Specify the maintenance domain name.
DOMAIN_NAME	Specify the maintenance domain name.
vlan	Specify the VLAN. When no primary VLAN is entered, the MEP uses the primary VLAN of the maintenance association.
VLAN_ID	Specify the VLAN ID.
local-vid	Specify the ID of the local VLAN.
VID	Specify the VLAN ID.
uni-mep	Specify that the MEP is a User Network Interface type.
bridge	Specify a bridge.
<1-32>	Specify a bridge ID.

Command Mode

Interface mode

Example

```
(config)#interface eth1
(config-if)#ethernet cfm mep down mpid 23 active true domain abc vlan 3 bridge 1
(config-if)#ethernet cfm mep down mpid 23 active true domain abc vlan 3 local-vid 4 bridge 1
(config-if)#ethernet cfm mep down mpid 23 active true domain abc bridge 1
(config-if)#no ethernet cfm mep down mpid 23 domain abc vlan 3 bridge 1
(config-if)#no ethernet cfm mep down mpid 23 domain abc bridge 1
```

ethernet cfm server-ais

Use this command to enable or disable a maintenance end point server for alarm indicator signaling (AIS).

Ethernet Alarm Indication Signal function (ETH-AIS) is used to suppress alarms following detection of defect conditions at the server (sub) layer. Transmission of frames with AIS information can be enabled or disabled on a MEP.

The expected result is that lower-level alarms will not trigger higher-level MEPs and MIPs to generate alarms. The rationale is that an alarm in the provider's network should not alter the customer equipment, so it is easier to pinpoint which network, the provider's or the customer's, is the source of the triggered alarms.

Command Syntax

```
ethernet cfm server-ais status (enable|disable) level LEVEL (interval TX_INTERVAL|)
    (bridge <1-32>|)
```

Parameters

status	Specify the status of a MEP server.
disable	Specify to disable the AIS server for the MEP.
enable	Specify to enable the AIS server for the MEP.
level	Specify the maintenance level.
LEVEL	Specify the maintenance level <1-7>.
interval	Specify the transmission interval.
TX_INTERVAL	Specify the transmission interval, either 1 or 10 seconds; the default value is 1 second.
bridge	Specify a bridge.
<1-32>	Specify a bridge ID.

Command Mode

Interface mode

Example

```
#configure terminal
(config)#interface eth1
(config-if)#ethernet cfm server-ais status enable level 3 interval 4 bridge 1
(config-if)#ethernet cfm server-ais status disable level 3 bridge 1
```

ethernet cfm traceroute cache

Use this command to enable traceroute cache for a bridge.

Use the `no` form of this command to disable the traceroute cache.

Command Syntax

```
ethernet cfm traceroute cache (bridge <1-32>|)
no ethernet cfm traceroute cache (bridge <1-32>|)
```

Parameters

bridge	Identify a bridge.
<1-32>	Bridge ID.

Command Mode

Configure mode

Examples

```
(config)#ethernet cfm traceroute cache bridge 1
(config)#ethernet cfm traceroute cache size 29 bridge 1
(config)#no ethernet cfm traceroute cache size bridge 1
(config)#no ethernet cfm traceroute cache bridge 1
```

ethernet cfm traceroute cache size

Use this command to set a traceroute cache size for a bridge.

Use the `no` form of this command to remove the traceroute cache size.

Command Syntax

```
ethernet cfm traceroute cache size ENTRIES (bridge <1-32>|)
no ethernet cfm traceroute cache size (bridge <1-32>|)
```

Parameters

bridge	Identify a bridge.
<1-32>	Bridge ID.
size	Indicates the size of the cache.
ENTRIES	Indicates the size of the cache.

Command Mode

Configure mode

Examples

```
(config)#ethernet cfm traceroute cache bridge 1
(config)#ethernet cfm traceroute cache size 29 bridge 1
(config)#no ethernet cfm traceroute cache size bridge 1
(config)#no ethernet cfm traceroute cache bridge 1
```

ethernet cfm vid

Use this command to configure a default VLAN priority for a bridge. This priority is used when `onmd` receives a CVLAN frame (maintenance VID) sent out of the PNP with the SVLAN. You can also configure a priority for the SVLAN on the bridge. This priority is carried in the SVLAN header going out of the PNP.

Similarly, SVLAN frames received by `onmd` are relayed out of CEP on the default VID of the PEP. The software forwarder itself forwards double-tagged frames if they are without a C-TAG.

Command Syntax

```
ethernet cfm vid <2-4094> priority <0-7> (bridge <1-32>|)
```

Parameters

<code>vid</code>	Specify the VLAN.
<code><2-4094></code>	Specify the VLAN ID.
<code>priority</code>	Default priority for CFM frames to relay
<code><0-7></code>	Default priority for CFM frames to relay
<code>bridge</code>	Specify a bridge.
<code><1-32></code>	Specify a bridge ID.

Command Mode

Configure mode

Examples

```
#config terminal
(config)#ethernet cfm vid 3 priority 4 bridge 1

#configure terminal
(config)#ethernet cfm vid 7 priority 2
```

exit-interface-eth-cfm-mep

Use this command to exit Ethernet CFM MEP configuration mode and return to interface mode.

Command Syntax

```
exit-interface-eth-cfm-mep
```

Parameters

None

Command Mode

Interface Ethernet CFM MEP configuration mode

Examples

```
(config)#interface eth1
(config-if)#ethernet cfm mep down mpid 23 active true domain abc vlan 3 bridge
1
...
(config-if-eth-cfm-mep)#exit-interface-eth-cfm-mep
(config-if)#
```

exm tx

Use this command to configure Ethernet experimental OAM messages functionality between a host and a destination MEP in an administrative domain. ZebOS-XP handles the message part of the frame alone; in other words, ZebOS-XP can identify the frame, but does not handle the payload.

Note: Interoperability of vendor-specific OAM is not expected when using equipment from different vendors.

Command Syntax

```
exm tx unicast rmepid RMEPID
```

Parameters

<code>rmepid</code>	Specify the ID of the remote MEP.
---------------------	-----------------------------------

Command Mode

Ethernet CFM MEP configuration mode

Examples

```
(config-cfm-mep)#exm tx unicast rmepid 5
```

in-service testing

This command is used to enable in-service testing.

Command Syntax

```
in-service testing
```

Parameters

None

Command Mode

Ethernet CFM MEP configuration mode

Examples

```
(config-cfm-mep)#in-service testing
```

Imm

Use this command to configure Loss Measurement Messages (LMM) for a MEP.

Command Syntax

```
lmm (unicast rmepid RMEPID | multicast) duration <5-60> ((interval (1 | 2 | 3 | 4)) |)
```

Parameters

unicast	Specify the unicast frame to be sent
rmepid	Specify the MEPID of remote MEP.
multicast	Specify the multicast frame to be sent
duration	Specify an integer that sets the delay measurement duration <5-60>.
interval	Specify a DMM transmission interval.
1	Specify a DM Transmission interval <100 ms>.
2	Specify a DM Transmission interval <10 ms>.
3	Specify a DM Transmission interval <1 second>.
4	Specify a DM Transmission interval <10 seconds>.

Command Mode

Ethernet CFM MEP configuration mode

Examples

The following example configures LMM to send multicast frames for a duration of 8 seconds at a transmission interval of 10 seconds:

```
(config-cfm-mep)#lmm multicast duration 8 interval 4
```

The following example configures LMM to send multicast frames, for a duration of 9 seconds:

```
(config-cfm-mep)#lmm multicast duration 9
```

The following example configures LMM to send unicast frames to remote MEP 7 for a duration of 10 seconds:

```
(config-cfm-mep)#lmm unicast rmepid 7 duration 10
```

mcc tx

Use this command to enable transmission of Maintenance Communication Channel (MCC) frames from the host MEP to a specified unicast address or a default multicast address for the maintenance entity group (MEG) level.

Command Syntax

```
mcc tx (unicast rmepid RMEPID| multicast)
```

Parameters

unicast	Specify to send unicast MCC frames.
rmepid	Specify an integer that identifies the remote MEP for unicast frames.
multicast	Specify to send multicast MCC frames.

Command Mode

Ethernet CFM MEP configuration mode

Example

```
(config-cfm-mep)#mcc tx unicast rmepid 7  
(config-cfm-mep)#mcc tx multicast
```

mep attributes

Use these commands to configure attributes for a MEP:

- Fault notification generation (FNG)
- Linktrace messages (LTM)
- Loopback messages (LTM)

Command Syntax

```
mep ((ccm-ltm-priority VAL)|(lowest-priority-defect (1|2|3|4|5|6))|(fng-alarm-time VAL)|(reset-fng-time VAL)|(active (true|false)))  
mep ((ccm-ltm-flags VAL)|(tx-ltm-target-mac MAC) |(tx-ltm-target-mepid MEPID)|(tx-ltm-target-is-mepid (true|false)) |(tx-ltm-ttl VAL)|(tx-ltm-egress-id STRING))  
mep ((tx-lbm-status (true|false))|(tx-lbm-destination-mac MACADDRESS)|(tx-lbm-destination-mepid MEPID)|(tx-lbm-destination-is-mepid (true|false))|(tx-lbm-messages COUNT)|(tx-lbm-data-tlv STRING)|(tx-lbm-vlan-priority VAL)|(tx-lbm-vlan-drop-enable (true|false))|(tx-lbm-time-out-value TIMEOUT_VAL))(tx-lbr-time-out-value TIMEOUT_VAL))
```

Parameters

ccm-ltm-priority	Specifies the CCM linktrace message priority.
VAL	Specifies the value of the attribute.
lowest-priority-defect	Specifies the lowest level defect allowed to generate alarms.
(1 2 3 4 5 6))	Specifies the value of the attribute.
fng-alarm-time	Specifies the time that the defects must be present before alarm is generated.
VAL	Specifies the value of the attribute.
reset-fng-time	Specifies the time that the defect must be absent before alarm is cleared.
VAL	Specifies the value of the attribute.
active	Specifies the administrative state of the MEP.
false	Specifies MEP is to cease functioning.
true	Specifies MEP is to function normally.
ccm-ltm-flags	Specifies the transmit LTM flags.
VAL	Specifies the value of the attribute.
tx-ltm-target-mac	Specifies the transmit LTM target mac address.
MAC	Specifies the MAC address.

<code>tx-ltm-target-mepid</code>	
	Specifies the transmit LTM Target MEP ID.
<code>MEPID</code>	Specifies the MEP ID.
<code>tx-ltm-target-is-mepid</code>	
	Specifies the LTM transmission target MEP ID is the same as the source MEP.
<code>false</code>	Specifies to not use the MEPID for the destination MEP.
<code>true</code>	Specifies to use the MEPID for the destination MEP.
<code>tx-ltm-ttl</code>	
	Specifies the transmit LTM TTL value, which is the trigger for sending LT messages.
<code>VAL</code>	Specifies the TTL value.
<code>tx-ltm-egress-id</code>	
	Specifies the transmit LTM Egress ID.
<code>STRING</code>	String that identifies the LTM egress ID.
<code>tx-lbm-status</code>	
	Specifies that the LBM transmission is allowed or not allowed.
<code>false</code>	Specifies LBM transmission is not allowed.
<code>true</code>	Specifies LBM transmission is allowed.
<code>tx-lbm-destination-mac</code>	
	Specifies the MAC for the destination
<code>MACADDRESS</code>	Specifies the MAC address.
<code>tx-lbm-destination-mepId</code>	
	Specifies the remote MEP ID.
<code>MEPID</code>	Specifies the remote MEP ID.
<code>tx-lbm-destination-is-mepId</code>	
	Specifies to use the MEPID for the destination MEP.
<code>false</code>	Specifies to not use the MEPID for the destination MEP.
<code>true</code>	Specifies to use the MEPID for the destination MEP.
<code>tx-lbm-messages</code>	
	Specifies the number of LBMs to send.
<code>COUNT</code>	Specifies the number of LBMs to send.
<code>tx-lbm-data-tlv</code>	
	Specifies the data to include in the data TLV
<code>STRING</code>	Specifies the data TLV.
<code>tx-lbm-vlan-priority</code>	
	Specifies the VLAN priority in the VLAN tag.
<code>VAL</code>	Specifies the value of the attribute.
<code>tx-lbm-vlan-drop-enable</code>	
	Specifies the drop enable bit in the VLAN tag.
<code>false</code>	Unsets the drop enable bit in the VLAN tag.
<code>true</code>	Sets the drop enable bit in the VLAN tag.

tx-lbm-time-out-value

Specifies the loopback message timeout.

TIMEOUT_VAL Specifies the timeout value.

tx-lbr-time-out-value

Specifies the loopback reception timeout.

TIMEOUT_VAL Specifies the timeout value.

Command Mode

Interface Ethernet CFM MEP configuration mode

Example

```
#configure terminal
(config)#interface eth1
(config-if)#ethernet cfm mep down mpid 23 active true domain abc vlan 3 bridge
1
(config-if-eth-cfm-mep)#mep ccm-ltm-priority 3
(config-if-eth-cfm-mep)#mep lowest-priority-defect 3
(config-if-eth-cfm-mep)#mep fng-alarm-time 250
(config-if-eth-cfm-mep)#mep reset-fng-time 250
```

mep crosscheck

Use this command to provision crosscheck MEP on a specific VLAN and optionally specify a MAC address. To create a link-level MEP, omit the VLANID.

In the event that multicast CCM is enabled in a maintenance entity group (MEG) level, an attempt to start unicast CCM between two MEPs at the same MEG level causes an error.

Use the `no` form of this command to delete the MEP.

Command Syntax

```
mep crosscheck mpid MEPID (vlan VLANID|) (mac MAC|)
no mep crosscheck mpid MEPID (vlan VLANID|) (mac MAC|)
```

Parameters

<code>mpid</code>	Host MEP.
<code>MEPID</code>	Specify the host MEP ID <1-8191>.
<code>vlan</code>	Specify the VLAN.
<code>VLAN_ID</code>	Specify the VLAN ID <2-4094>.
<code>mac</code>	Specify the MAC address. This is mandatory for unicast messaging.
<code>MAC</code>	Specify the MAC address in HHHH.HHHH.HHHH format.

Command Mode

Interface mode

Example

This example configures a MEP for crosscheck on a VLAN:

```
#configure terminal
(config)#ethernet cfm domain-name type character-string name new level 1 mip-
creation none
(config-ether-cfm)#mep crosscheck mpid 3 vlan 3
```

This example configures a link-level MEP for crosscheck:

```
#configure terminal
(config)#ethernet cfm domain-name type character-string name new level 1 mip-
creation none
(config-ether-cfm)#mep crosscheck mpid 51
```

mep mpid

Use this command to enter Ethernet CFM MEP configuration mode where you can configure the given MEP.

Command Syntax

```
mep mpid MPID (vlan VLANID|)
```

Parameters

mpid	MEP.
MPID	MEP ID <1-8191>.
vlan	VLAN.
VLANID	VLAN ID <1-4094>.

Command Mode

Ethernet CFM configuration mode

Example

```
(config-ether-cfm)#mep mpid 5 vlan 4  
(config-cfm-mep)#
```

out-of-service testing

This command is used to enable out-of-service testing.

Command Syntax

```
out-of-service lck-level <0-7> testing
```

Parameters

<code>lck-level</code>	Specify the level at which LCK frames should be sent.
------------------------	---

Command Mode

Ethernet CFM MEP configuration mode

Examples

```
(config-cfm-mep)#out-of-service lck-level 4 testing
```

ping ethernet

Use this command to send unicast or multicast loopback TLV type 3 (data) or type 32 (test) information.

For type 3 frames, enter the size of the loopback packet, and for type 32 frames, enter a test pattern. The receiving maintenance end point sends back the number of bytes (for type 3) or the test pattern (for type 32) as requested in the command line.

Command Syntax

```
ping ethernet (multicast (recursive|) | unicast rmeid RMEPID) mepid MEPID
  (domain DOMAIN_NAME | level LEVEL) (vlan VLAN_ID|)
  (tlv (data VAL | test (1 | 2 | 3 |4))|) (bridge <1-32>|)
```

Parameters

multicast	Send multicast messages
recursive	Send recursive multicast frames (5 frames)
unicast	Send unicast messages
rmeid	Enter the destination MEP ID
RMEPID	Specify the remote host MEP ID <1-8191>.
mepid	Host MEP.
MEPID	Specify the host MEP ID <1-8191>.
domain	Specify the maintenance domain name.
DOMAIN_NAME	Specify the maintenance domain name.
level	Specify the level associated with the domain.
LEVEL	Specify the level <0-7>.
vlan	Specify the VLAN.
VLAN_ID	Specify the VLAN ID <2-4094>.
tlv	Type, length, value; encoded parameters that are included in the message body.
data	TLV type data
VAL	The number of bytes of TLV data to send
test	TLV test type, including:
1	Test Pattern- abc
2	Test Pattern- 1234
3	Test Pattern- a1b2c
4	Test Pattern- 1a2b3c
bridge	Specify a bridge.
<1-32>	Specify a bridge ID.

Command Mode

Exec mode and Privileged Exec mode

Command Example

```
#ping ethernet multicast mepid 3 domain abc vlan 3 bridge 1  
#ping ethernet multicast mepid 4 level 4 vlan 3 tlv data 8 bridge 1  
#ping ethernet unicast rmepid 5 mepid 3 domain abc vlan 3 tlv test 3 bridge 1
```

ping ethernet mac

Use this command to send a loopback message for a MAC address to a remote MEP for fault verification. Use either the `domain` or the `level` parameter with the `vlan` or `bridge` parameter to target a specific device.

Command Syntax

```
ping ethernet mac MACADDRESS unicast source MEPID
  (domain DOMAIN_NAME | level LEVEL) (vlan VLAN_ID|)
  (tlv (data VAL | test (1 | 2 | 3 |4))|) (bridge <1-32>|)
```

Parameters

<code>mac</code>	Specify the MAC address.
<code>MACADDRESS</code>	Specify the MAC address in HHHH.HHHH.HHHH format.
<code>source</code>	Host MEP.
<code>MEPID</code>	Specify the host MEP ID <1-8191>.
<code>domain</code>	Specify the maintenance domain name.
<code>DOMAIN_NAME</code>	Specify the maintenance domain name.
<code>level</code>	Specify the level associated with the domain.
<code>LEVEL</code>	Specify the level <0-7>.
<code>vlan</code>	Specify the VLAN.
<code>VLAN_ID</code>	Specify the VLAN ID <2-4094>.
<code>tlv</code>	Type, length, value; encoded parameters that are included in the message body.
<code>data</code>	TLV type data
<code>VAL</code>	The number of bytes of TLV data to send
<code>test</code>	TLV test type:
<code>1</code>	Test Pattern- abc
<code>2</code>	Test Pattern- 1234
<code>3</code>	Test Pattern- a1b2c
<code>4</code>	Test Pattern- 1a2b3c
<code>bridge</code>	Specify a bridge.
<code><1-32></code>	Specify a bridge ID.

Command Mode

Exec mode and Privileged Exec mode

Examples

```
#ping ethernet mac 1.1.1.1 unicast source 1 domain new bridge 1
```

service ma-name

Use this command to configure the CFM (Connectivity Fault Management) interface to notify the Ethernet virtual connection (EVC) the status of a particular level for CE. Once configured, the CFM interface sends notifications only for the configured levels.

Command Syntax

```
service ma-name MA_NAME evc-status elmi (enable|disable)
```

Parameters

ma-name	Enter the Maintenance Association (MA)
MA_NAME	Enter the MA name
elmi	Specify whether to inform ELMI
disable	Set feature to disable
enable	Set feature to enable

Command Mode

Ethernet Configure mode

Example

```
#configure terminal
#(config)#ethernet cfm domain-name type character-string name test level 3
mip-creation default bridge 1
#(config-ether-cfm)#service ma-type integer ma-name 3 vlan 21 mip-creation
default
#(config-ether-cfm)#mep crosscheck mpid 52 vlan 21
#(config-ether-cfm)#service ma-name 3 evc-status elmi enable
```

service ma-type

Use this command to create a service Maintenance Association (MA) without a VLAN. This command allows creation of a maintenance association for link-level MEPs (level 0), which do not listen on a VLAN.

The VLAN_ID passed in this command must be the primary VID for the VLAN. A VID can be associated with an MA only at the time of MA creation. If an MA is created without a VID, a VID cannot be added to it during runtime because an MA without a VID is a link-level MA.

Use the `no` form of this command to remove an MA.

Command Syntax

```
service ma-type (primary-vid | string | integer | vpn-id) ma-name MA_NAME
    (vlan VLAN_ID mip-creation (none|default|explicit|defer) |)
no service CSI_ID (vlan VLAN_ID mip-creation (none|default|explicit|defer) |) "
```

Parameters

primary-vid	Specify the ID of a the primary VLAN in the MA.
integer	Specify an integer that identifies the MA.
string	Specify the character string that identifies the MA.
vpn-id	Specify a virtual private network ID that identifies the MA.
ma-name	Enter the Maintenance Association (MA)
MA_NAME	Enter the MA name
CSI_ID	Enter the MA name
vlan	Specify the VLAN.
VLAN_ID	Specify the VLAN ID <2-4094>.
mip-creation	Specify the MIP creation permission value:
none	Specify that no MIP may be created at this level.
default	Specify that the MIP can be created for a VID on the bridge.
explicit	Specify that the MIP can be created for the VID only on bridge ports through which the VID can pass.
defer	Specify to use the MIP creation permissions of the MD to which this MA belongs.

Command Mode

Ethernet CFM mode

Example

```
#configure terminal
(config)#ethernet cfm domain-name type character-string name new level 1 mip-
creation none
(config-ether-cfm)#service ma-type string ma-name 12 vlan 3 mip-creation
default
```

show ethernet cfm active-levels

Use this command to display active levels for a VID on a specific interface. One active level is selected for MIP creation.

Command Syntax

```
show ethernet cfm active-levels vid VID (interface IF_NAME|)
((bridge <1-32> | backbone)|)
```

Parameters

vid	Specify the VLAN.
VID	Specify the VLAN ID <2-4094>.
interface	Specify the interface.
IF_NAME	Specify the interface name.
bridge	Specify a bridge.
<1-32>	Specify a bridge ID.
backbone	Backbone bridge.

Command Mode

Exec mode and Privileged Exec mode

Example

```
#show ethernet cfm active-levels vid 3 interface eth1 bridge 1
#show ethernet cfm active-levels vid 3 bridge 1
```

show ethernet cfm ais

Use this command to display the status of alarm indicator signaling (AIS).

Command Syntax

```
show ethernet cfm ais defect-condition mep MEPID domain DOMAIN_NAME vlan VLAN_ID|)
    (bridge <1-32>|)

show ethernet cfm ais reception-status mep MEPID domain DOMAIN_NAME (vlan VLAN_ID|)
    (bridge <1-32>|)
```

Parameters

defect-condition	Display defect condition detected causing AIS generation
reception-status	Display AIS frame received on MEP.
mep	Host MEP.
MEPID	Specify the host MEP ID <1-8191>.
domain	Specify the maintenance domain name.
DOMAIN_NAME	Specify the maintenance domain name.
vlan	Specify the VLAN.
VLAN_ID	Specify the VLAN ID <2-4094>.
bridge	Specify a bridge.
<1-32>	Specify a bridge ID.

Command Mode

Exec mode and Privileged Exec mode

Example

```
#show ethernet cfm ais reception-status mep 4 domain abc vlan 3 bridge 1
```

show ethernet cfm dual-ended lmm

Use this command to display the frame-loss computed as part of dual-end ETH-LM.

Command Syntax

```
show ethernet cfm dual-ended lmm mep MEPID domain DOMAIN_NAME
    (vlan <2-4094> |) (bridge <1-32>|)
```

Parameters

mep	Host MEP.
MEPID	Specify the host MEP ID <1-8191>.
domain	Specify the maintenance domain name.
DOMAIN_NAME	Specify the maintenance domain name.
vlan	Specify the VLAN.
<2-4094>	Specify the VLAN ID.
bridge	Specify a bridge.
<1-32>	Specify a bridge ID.

Command Mode

Exec mode and Privileged Exec mode

Example

The following is the output if ETH-LM was running and then disabled, so there is no ETH-LM information in the current CCM.

```
#show ethernet cfm dual-ended lmm mep 9 domain abc vlan 3 bridge 1
MEP: 9      RMEP: 11
Start Time: 02:12:36
End Time: 02:15:37
Near-End Frame Loss = 0
Far-End Frame Loss = 0
```

The following is the output if ETH-LM is running. That is, CCM frames have ETH-LM information.

```
#show ethernet cfm dual-ended lmm mep 9 domain abc vlan 3 bridge 1
MEP: 9      RMEP: 11
Start Time: 02:12:36
Near-End Frame Loss = 0
Far-End Frame Loss = 0
Current Time: 02:15:37
Current Near-End Frame loss: 0
Current Far-end Frame loss:0
```

show ethernet cfm errors

Use this command to display CFM errors for a device

Command Syntax

```
show ethernet cfm errors (domain DOMAIN_NAME|level LEVEL_ID) (bridge <1-32>|)
```

Parameters

domain	Specify the maintenance domain name.
DOMAIN_NAME	Specify the maintenance domain name.
level	Specify the maintenance level.
LEVEL_ID	Specify the maintenance level <0-7>.
bridge	Specify a bridge.
<1-32>	Specify a bridge ID.

Command Mode

Exec mode and Privileged Exec mode

Example

```
#show ethernet cfm errors domain 7 bridge 1
```

show ethernet cfm ma status

Use this command to view the connectivity status of an MA in a domain.

Command Syntax

```
show ethernet cfm ma status domain DOMAIN_NAME (vlan <2-4094>|)
(mep <1-8191>| mep all|) (bridge <1-32>|)
```

Parameters

domain	Specify the maintenance domain name.
DOMAIN_NAME	Specify the maintenance domain name.
vlan	Specify the VLAN.
<2-4094>	Specify the VLAN ID.
mep	Host MEP.
<1-8191>	Specify the host MEP ID.
all	Specify all MEPs.
bridge	Specify a bridge.
<1-32>	Specify a bridge ID.

Command Mode

Exec mode and Privileged Exec mode

Example

```
#show ethernet cfm ma status domain abc vlan 2 bridge 1
```

show ethernet cfm maintenance-points local

Use this command to display information about the maintenance points on a local interface. Target information by choosing either a MEP or MIP, plus an interface name, domain name, or level ID.

Command Syntax

```
show ethernet cfm maintenance-points local (mep|mip)
(interface IFNAME|domain DOMAIN_NAME|level LEVEL_ID) (bridge <1-32>|)
```

Parameters

mep	Display the Maintenance End Point.
mip	Display the Maintenance Intermediate Point.
interface	Specify the interface.
IF_NAME	Specify the interface name.
domain	Specify the maintenance domain name.
DOMAIN_NAME	Specify the maintenance domain name.
level	Specify the maintenance level.
LEVEL	Specify the maintenance level <0-7>.
bridge	Specify a bridge.
<1-32>	Specify a bridge ID.

Command Mode

Exec mode and Privileged Exec mode

Example

```
#show ethernet cfm maintenance-points local mep domain new bridge 1
```

show ethernet cfm maintenance-points remote

Use this command to display detailed information about a remote MEP in the continuity check database.

Command Syntax

```
show ethernet cfm maintenance-points remote (mpid MEP_ID| mac MAC_ADDRESS|)  
      (domain DOMAIN_NAME|level LEVEL_ID) (vlan VLAN_ID|) (bridge <1-32>|
```

Parameters

mpid	Remote MEP.
MEPID	Specify the remote MEP ID <1-8191>.
mac	Specify the MAC address.
MAC	Specify the MAC address in HHHH.HHHH.HHHH format.
domain	Specify the maintenance domain name.
DOMAIN_NAME	Specify the maintenance domain name.
level	Specify the maintenance level.
LEVEL	Specify the maintenance level <0-7>.
vlan	Specify the VLAN.
VLAN_ID	Specify the VLAN ID <2-4094>.
bridge	Specify a bridge.
<1-32>	Specify a bridge ID.

Command Mode

Exec mode and Privileged Exec mode

Example

```
#show ethernet cfm maintenance-points remote domain mpid bridge 1
```

show ethernet cfm mep

Use this command to display CFM MEP information.

Command Syntax

```
show ethernet cfm mep MEPID domain DOMAIN_NAME (vid VID|) (bridge <1-32>|)
```

Parameters

mep	Host MEP.
MEPID	Specify the host MEP ID <1-8191>.
domain	The name of the maintenance domain.
domain	Specify the maintenance domain name.
DOMAIN_NAME	Specify the maintenance domain name.
vid	Specify the VLAN.
VID	Specify the VLAN ID <2-4094>.
bridge	Specify a bridge.
<1-32>	Specify a bridge ID.

Command Mode

Exec mode and Privileged Exec mode

Example

```
#show ethernet cfm maintenance-points remote domain mpid bridge 1
```

show ethernet cfm traceroute-cache

Use this command to display information about the traceroute cache.

Command Syntax

```
show ethernet cfm traceroute-cache (bridge <1-32>|)
```

Parameters

bridge	Specify a bridge.
<1-32>	Specify a bridge ID.

Command Mode

Exec mode and Privileged Exec mode

Example

```
#show ethernet cfm maintenance-points remote domain mpid bridge 1
```

snmp restart cfm

Use this command to restart SNMP in Connectivity Fault Management (CFM)

Command Syntax

```
snmp restart cfm
```

Parameters

None

Command Mode

Configure mode

Examples

```
#snmp restart cfm
```

throughput-measurement reception

Use this command to enable throughput-measurement reception.

Command Syntax

```
throughput-measurement reception duration <1-10>
```

Parameters

<code>duration</code>	Specify the maximum duration for waiting for TST frames before timing out <1-10>.
-----------------------	---

Command Mode

Ethernet CFM MEP configuration mode

Example

```
(config-cfm-mep)#throughput-measurement reception duration 5
```

throughput-measurement unicast

Use this command to enable frame throughput measurement to a remote MEP.

Throughput is defined as the maximum rate of frame transmission at which no frame is dropped. Throughput can be measured by sending frames at an increasing rate (up to a theoretical maximum), graphing the percentage of frames received, and reporting the rate at which frames start being dropped. In general, this rate is dependent on the frame size. Unicast Ethernet loopback (ETH-LB) or Ethernet Test (ETH-TST) frames, with the data field, can be used for performing throughput measurements.

Command Syntax

```
throughput-measurement unicast rmepid RMEPID
```

Parameters

<code>rmepid</code>	Specify the remote MEP ID.
---------------------	----------------------------

Command Mode

Ethernet CFM MEP configuration mode

Example

```
(config-cfm-mep)#throughput-measurement unicast rmepid 5
```

traceroute ethernet

Use this command to start traceroute messaging on a remote MEP.

Command Syntax

```
traceroute ethernet MAC (domain DOMAIN | level LEVEL) (vlan VLANID|)
    (bridge <1-32>|)
```

Parameters

MAC	Specify the MAC address in HHHH.HHHH.HHHH format.
domain	Specify the maintenance domain name.
DOMAIN_NAME	Specify the maintenance domain name.
level	Specify the maintenance level.
LEVEL	Specify the maintenance level <0-7>.
vlan	Specify the primary VLAN of the maintained association (MA).
VLAN_ID	Specify the VLAN ID <2-4094>.
bridge	Specify a bridge.
<1-32>	Specify a bridge ID.

Command Mode

Exec mode and Privileged Exec mode

Example

```
#traceroute ethernet 0000.1234.2323 domain customer vlan 4 bridge 1
```

tst

Use this command to send a unicast or multicast test (TST) frame with a selected pattern. For unicast, the test frame is sent to a designated MEP. When the `recursive` option is chosen, periodic test frames are sent. Otherwise, only a single test frame is sent.

Command Syntax

```
tst unicast RMEPID pattern (1 | 2 | 3 | 4) (recursive duration <5-60> interval
TX_INTERVAL|) (lck interval TX_INTERVAL (unicast rmepid RMEPID | multicast)|)

tst multicast pattern (1 | 2 | 3 | 4) (recursive duration <5-60> interval
TX_INTERVAL|) (lck interval TX_INTERVAL (unicast rmepid RMEPID | multicast)|)
```

Parameters

<code>unicast</code>	Specify unicast TST frames.
<code>rmepid</code>	Specify the remote MEP (required for unicast).
<code>multicast</code>	Specify multicast TST frames.
<code>pattern</code>	Specify the test pattern to be sent, including:
<code>1</code>	Specify the test pattern as abc.
<code>2</code>	Specify the test pattern as 1234.
<code>3</code>	Specify the test pattern as a1b2c.
<code>4</code>	Specify the test pattern as 1a2bc3.
<code>recursive</code>	Specify to send TST frames recursively.
<code>duration</code>	Specify the duration for which TST frames are to be sent in the range of <5-60> seconds.
<code>interval</code>	Specify the transmission interval.
<code>lck</code>	Specify that lock frames to be sent in opposite direction for out-of-service testing frames.
<code>interval</code>	Specify the transmission interval; value should be the same as AIS TX interval, either 1 or 60 seconds.
<code>unicast</code>	Specify to send unicast LCK.
<code>rmepid</code>	Specify the remote MEP ID.
<code>multicast</code>	Specify to send multicast LCK.

Command Mode

Ethernet CFM MEP configuration mode

Examples

```
(config-cfm-mep)#tst multicast pattern 4
(config-cfm-mep)#tst multicast pattern 4 lck interval 1 multicast
```

vsm tx

Use this command to configure the vendor-specific VSM OAM functionality between a host and a destination MEP in an administrative domain. ZebOS-XP handles the message part of the frame alone; in other words, ZebOS-XP can identify the frame, but does not handle the payload.

Note: Interoperability of vendor-specific OAM is not expected when using equipment from different vendors.

Command Syntax

```
vsm tx unicast rmepid RMEPID
```

Parameters

<code>rmepid</code>	Specify the ID of the remote MEP.
---------------------	-----------------------------------

Command Mode

Ethernet CFM MEP configuration mode

Examples

```
(config-cfm-mep)#vsm tx unicast rmepid 8
```


CHAPTER 3 EFM OAM Commands

Ethernet to the First Mile (EFM) provides a minimal extension to the MAC layer Operations, Administration and Maintenance (OAM) module. It supplies a mechanism for monitoring link operations, such as remote fault detection and remote loopback control.

This chapter has the commands used to manage the Ethernet OAM protocol processes. It includes the following commands:

- `ethernet oam debug`
- `ethernet oam disable`
- `ethernet oam enable`
- `ethernet oam link-monitor event-log-size`
- `ethernet oam link-monitor frame`
- `ethernet oam link-monitor frame-period`
- `ethernet oam link-monitor frame-seconds`
- `ethernet oam link-monitor high`
- `ethernet oam link-monitor on`
- `ethernet oam link-monitor supported`
- `ethernet oam link-monitor symbol-period`
- `ethernet oam max-rate`
- `ethernet oam min-rate`
- `ethernet oam mode`
- `ethernet oam remote-failure`
- `ethernet oam remote-loopback (start|stop)`
- `ethernet oam remote-loopback {supported|timeout}`
- `ethernet oam timeout`
- `ethernet oam unidirectional-link`
- `show ethernet oam`
- `show ethernet oam discovery`
- `show ethernet oam eventlog`
- `show ethernet oam statistics`
- `show ethernet oam status`
- `snmp restart efm`

ethernet oam debug

Use this command to set the debugging functions for OAM.

Use the `no` form of this command to disable OAM debugging.

Command Syntax

```
ethernet oam debug (event|rx|tx)
no ethernet oam debug (event|rx|tx)
```

Parameters

<code>event</code>	Enable event debugging.
<code>nsm</code>	Enable NSM debugging.
<code>rx</code>	Enable RX debugging.
<code>tx</code>	Enable TX debugging.

Command Mode

Exec mode and Privileged Exec mode

Example

```
#ethernet oam debug event
```

ethernet oam disable

Use this command to stop Ethernet OAM functionality on a port.

Command Syntax

```
ethernet oam disable
```

Parameters

None

Default

The default status of Ethernet OAM is disabled.

Command Mode

Interface mode

Examples

```
#configure terminal
(config)#interface eth1
(config-if)#ethernet oam disable
```

ethernet oam enable

Use this command to enable Ethernet OAM functionality on a port.

Command Syntax

```
ethernet oam enable
```

Parameters

None

Default

The default status of Ethernet OAM is disabled.

Command Mode

Interface mode

Examples

```
#configure terminal
(config)#interface eth1
(config-if)#ethernet oam enable
```

ethernet oam link-monitor event-log-size

Use this command to set the maximum number of entries in the event log.

Command Syntax

```
ethernet oam link-monitor event-log-size <1-100>
```

Parameters

event-log-size	Set a log size
<1-100>	Set a log size

Command Mode

Interface mode

Default

The default size is 20 entries

Example

```
#configure terminal
(config)#interface eth1
(config-if)#ethernet oam link-monitor event-log-size 100
```

ethernet oam link-monitor frame

Use this command to configure the low and high threshold and the window for the frame event. If the low threshold is exceeded, an errored frame link event is generated. If the high threshold is exceeded, the action defined using the command `ethernet oam link-monitor high threshold action` is taken

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

Command Syntax

```
ethernet oam link-monitor frame {threshold {high (<1-65535> | none) | low <0-65535>}|window <100-600>}  
  
no ethernet oam link-monitor frame {threshold {high|low}|window}
```

Parameters

threshold	Configure the error threshold
high	Value of the high threshold for errored frames
<1-65535>	Set the high threshold value
none	Disable high threshold check
low	Value of the low threshold for errored frames
<0-65535>	Set the low threshold value
window	Size of frame event window
<100-600>	Configure the frame event window in milliseconds <100-600>

Default

The default value for high threshold is none, meaning that no high threshold is configured. The default value of low threshold is 1. The default value for the frame event window is 100.

Command Mode

Interface mode

Examples

```
#configure terminal  
(config)#interface eth1  
(config-if)#ethernet oam link-monitor frame threshold high 5 low 2 window 200  
  
(config)#interface eth1  
(config-if)#no ethernet oam link-monitor frame window threshold high low
```

ethernet oam link-monitor frame-period

Use this command to configure the low and high threshold and the window values for the frame-period event. If the low threshold range is exceeded, an errored frame-period link event is generated. If the high threshold range is exceeded, the action defined using the command `ethernet oam link-monitor high threshold` is taken

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

Command Syntax

```
ethernet oam link-monitor frame-period {threshold {high (<1-65535> | none) |  
    low <0-65535>} |window <1-65535>}  
  
no ethernet oam link-monitor frame-period {threshold {high|low}|window}
```

Parameters

threshold	Configure the error threshold
high	Value of the high threshold for errored frames
<1-65535>	Set the high threshold value
none	Disable high threshold check
low	Value of the low threshold for errored frames
<0-65535>	Set the low threshold value
window	Size of frame event window.
<1-65535>	Set the size of frame event window in milliseconds <1-65535>

Default

The default value for high threshold is none, meaning that no high threshold is configured. The default value of low threshold is 1. The default value for the frame event window is 1000.

Command Mode

Interface mode

Examples

```
#configure terminal  
(config)#interface eth1  
(config-if)#ethernet oam link-monitor frame-period threshold high 5 low 2  
window 200
```

ethernet oam link-monitor frame-seconds

Use this command to configure the low and high threshold and the window for the frame-seconds event. If the low threshold is exceeded, an errored-frame-seconds link event is generated. If the high threshold is exceeded then action defined through the command ethernet oam link-monitor high threshold action will be taken

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

Command Syntax

```
ethernet oam link-monitor frame-seconds {threshold {high (<1-900> | none) | low <1-900>} |window <100-900>}  
  
no ethernet oam link-monitor frame-seconds {threshold {high|low}|window}
```

Parameters

threshold	Configure the error threshold
high	Value of the high threshold for errored frames
<1-900>	Set the high threshold value
none	Disable high threshold check
low	Value of the low threshold for errored frames
<1-900>	Set the low threshold value
window	Size of frame event window
<100-900>	Set the size of frame event window in milliseconds <100-900>

Command Mode

Interface mode

Examples

```
#configure terminal  
(config)#interface eth1  
(config-if)#ethernet oam link-monitor frame-seconds threshold high 5 low 2  
window 200  
  
(config)#interface eth1  
(config-if)#no ethernet oam link-monitor frame-seconds window threshold low
```

ethernet oam link-monitor high

Use this command to define an to take action when a high threshold is detected.

Use no form of this command to reset the action.

Command Syntax

```
ethernet oam link-monitor high threshold action error-disable-interface
no ethernet oam link-monitor high threshold action error-disable-interface
```

Parameters

error-disable-interface

Specify to disable the interface when the high threshold is exceeded.

Default

When the high threshold is exceeded it generates only the corresponding link event and does not trigger any interface events by default.

Command Mode

Interface mode

Examples

```
#configure terminal
(config)#interface eth1
(config-if)#ethernet oam link-monitor high threshold action error-disable-interface
```

ethernet oam link-monitor on

Use this command to turn on link monitoring on a interface.

Use the `no` form of this command to turn link monitoring off.

Command Syntax

```
ethernet oam link-monitor on
no ethernet oam link-monitor on
```

Parameters

None

Default

When link monitor is supported, link monitoring is automatically turned on.

Command Mode

Interface mode

Examples

```
#configure terminal
(config)#interface eth1
(config-if)#ethernet oam link-monitor on
```

ethernet oam link-monitor supported

Use this command to configure link monitoring on an interface.

Use the `no` form of this command to remove support for link monitoring on an interface.

Command Syntax

```
ethernet oam link-monitor supported
no ethernet oam link-monitor supported
```

Parameters

None

Command Mode

Interface mode

Default

The default state of the link monitor is supported.

Examples

```
#configure terminal
(config)#interface eth1
(config-if)#ethernet oam link-monitor supported
```

ethernet oam link-monitor symbol-period

Use this command to configure a low and high threshold, and a window for symbol-period events. When the low threshold maximum is exceeded, a symbol-period link event is generated. When the high threshold maximum is exceeded, the action defined using the command `ethernet oam link-monitor high threshold` is taken.

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

Command Syntax

```
ethernet oam link-monitor symbol-period {threshold {high (<1-65535> | none) | low
<0-65535>}|window <1-65535>}

no ethernet oam link-monitor symbol-period {threshold {high|low}|window}
```

Parameters

threshold	Configure the error threshold
high	Value of the high threshold for errored frames
<1-65535>	Set the high threshold value
none	Disable high threshold check
low	Value of the low threshold for errored frames
<0-65535>	Set the low threshold value
window	Size of frame event window
<1-65535>	Set the size of frame event window in milliseconds

Default

The default value for high threshold is none, meaning no high threshold is configured. The default value of low threshold is 0. The default value of symbol period window is 100.

Command Mode

Interface mode

Examples

```
#configure terminal
(config)#interface eth1
(config-if)#ethernet oam link-monitor symbol-period threshold high 5 low 2
window 200
```

ethernet oam max-rate

Use this command to set the maximum number of PDUs per second.

This command is to ensure that the sublayer adheres to the maximum number of OAMPDUs per second. The minimum is 1 OAMPDU per second and the maximum is 10 OAMPDUs per second.

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

Command Syntax

```
ethernet oam max-rate <1-10>
no ethernet oam max-rate
```

Parameter

<1-10>	The maximum number of PDUs per second.
--------	--

Default

The default value of the maximum rate is 10 PDUs per second.

Command Mode

Interface mode

Examples

```
#configure terminal
(config)#interface eth1
(config-if)#ethernet oam max-rate 10
```

ethernet oam min-rate

Use this command to set the minimum number of PDUs per second.

This command is to ensure that the sublayer adheres to the maximum number of OAMPDUs per second. The minimum is 1 OAMPDU per second and the maximum is 10 OAMPDUs per second.

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

Command Syntax

```
ethernet oam min-rate <1-10>
no ethernet oam min-rate
```

Parameter

<1-10>	The minimum number of PDUs per second.
--------	--

Default

The default value of the minimum rate is 1 second.

Command Mode

Interface mode

Examples

```
#configure terminal
(config)#interface eth1
(config-if)#ethernet oam min-rate 1
```

ethernet oam mode

Use this command to set data terminal equipment (DTE) to either active or passive mode.

Command Syntax

```
ethernet oam mode (active|passive)
```

Parameters

active	Set DTE to active
passive	Set DTE to passive

Default

The default Ethernet OAM mode for the DTE is active.

Command Mode

Interface mode

Example

```
#configure terminal
(config)#interface eth1
(config-if)#ethernet oam mode active

#configure terminal
(config)#interface eth1
(config-if)#ethernet oam mode passive
```

ethernet oam remote-failure

Use this command to define action when remote failure is detected.

Use `no` form of this command to reset the action.

Command Syntax

```
ethernet oam remote-failure {critical-event|dying-gasp|link-fault} action error-  
disable-interface
```

```
no ethernet oam remote-failure {critical-event|dying-gasp|link-fault} action error-  
disable-interface
```

Parameters

`critical-event` Specify the remote event as a critical link event.

`dying-gasp` Specify the remote event as a dying-gasp event.

`link-fault` Specify the remote event as a link-fault event.

`action` Specify the action on a remote failure.

`error-disable-interface`

Specify to disable the interface when a remote failure event is detected.

Default

Remote failure does not trigger any interface events by default.

Command Mode

Interface mode

Examples

```
#configure terminal  
(config)#interface eth1  
(config-if)#ethernet oam remote-failure critical-event action error-disable-  
interface
```

ethernet oam remote-loopback (start|stop)

Use this command to start or stop remote loopback.

Command Syntax

```
ethernet oam remote-loopback start
ethernet oam remote-loopback stop
```

Parameters

supported	Specify to start remote loopback.
timeout	Specify to stop remote loopback.

Command Mode

Interface mode

Examples

```
#configure terminal
(config)#interface eth1
(config-if)#ethernet oam remote-loopback start

#configure terminal
(config)#interface eth1
(config-if)#ethernet oam remote-loopback stop
```

ethernet oam remote-loopback {supported|timeout}

Use this command to configure remote loopback on an interface.

Use the `no` form of this command to remove remote-loopback support from the interface.

Command Syntax

```
ethernet oam remote-loopback {supported|timeout <1-10>}  
no ethernet oam remote-loopback {supported|timeout}
```

Parameters

<code>supported</code>	Specify to configure remote loopback support.
<code>timeout</code>	Specify to set a remote loopback timeout value.
<code><1-10></code>	Specify the number of seconds the DTE will wait for the remote DTE to respond to the <code>ethernet oam remote-loopback enable</code> command.

Default

The default state for the remote loopback is supported. If a timeout is not configured, the local DTE remains in remote loopback state until the remote DTE responds or the user stops remote loopback administratively.

Command Mode

Interface mode

Examples

```
#configure terminal  
(config)#interface eth1  
(config-if)#ethernet oam remote-loopback supported  
  
#configure terminal  
(config)#interface eth1  
(config-if)#ethernet oam remote-loopback timeout 2  
  
#configure terminal  
(config)#interface eth1  
(config-if)#no ethernet oam remote-loopback supported  
  
#configure terminal  
(config)#interface eth1  
(config-if)#no ethernet oam remote-loopback timeout
```

ethernet oam timeout

Use this command to set the OAM timeout.

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

Command Syntax

```
ethernet oam timeout <2-30>
no ethernet oam timeout
```

Parameter

`<2-30>` Specify the number of seconds for the link-timer

Command Mode

Interface mode

Default

The default value of the timeout is 5 seconds

Examples

```
#configure terminal
(config)#interface eth1
(config-if)#ethernet oam timeout 5

(config)#interface eth1
(config-if)#no ethernet oam timeout
```

ethernet oam unidirectional-link

Use this command to set unidirectional-link support.

Use the `no` form of this command to reset unidirectional-link support to its default.

Command Syntax

```
ethernet oam unidirectional-link supported
no ethernet oam unidirectional-link supported
```

Parameter

None

Command Mode

Interface mode

Default

Unidirectional-link support is disabled by default.

Examples

```
#configure terminal
(config)#interface eth1
(config-if)#ethernet oam unidirectional-link supported

(config-if)#no ethernet oam unidirectional-link supported
```

show ethernet oam

Use this command to show the discovery state machine state and link event statistics on the interface.

Command Syntax

```
show ethernet oam IFNAME
```

Parameter

IFNAME Specify the interface name.

Command Mode

Exec mode and Privileged Exec mode

Examples

The following sample output from this command displays the operational discovery state machine and link event statistics of the interface.

```
#show ethernet oam eth0

eth0
Discovery State Machine Details:
-----
EFM Discovery Machine State:          Send Any
Local Parser State:                   Forward
Local Multiplexer State:              Forward
Remote Parser State:                  Forward
Remote Multiplexer State:             Forward

Local Client:
-----
  Symbol Period Error:
    Window:                           05f5e100 Symbol(s)
    Threshold:                         00 Symbol(s)
    Last Window Symbols Errors:         00 Symbol(s)
    Total Symbols Errors:               00 Symbol(s)
    Total Symbols Errors Events:        0 Events(s)
    Relative Timestamp of the Event:    0 x 100 milliseconds

  Frame Error:
    Window:                           100 x 100 milliseconds
    Threshold:                         1 Error Frame(s)
    Last Window Frame Errors:           0 Frame(s)
    Total Frame Errors:                 00 Frames(s)
    Total Frame Errors Events:          0 Events(s)
    Relative Timestamp of the Event:    0 x 100 milliseconds

  Frame Period Error:
    Window:                           989680 Frames
    Threshold:                         1 Error Frame(s)
    Last Window Frame Errors:           0 Frame(s)
    Total Frame Errors:                 00 Frames(s)
    Total Frame Period Errors Events:   0 Events(s)
    Relative Timestamp of the Event:    0 x 100 milliseconds
```

Frame Seconds Error:

Window: 1000 x 100 milliseconds
 Threshold: 1 Error Second(s)
 Last Window Frame Second Errors: 0 Frame(s)
 Total Frame Second Errors: 00 Frames(s)
 Total Frame Second Errors Events: 0 Events(s)
 Relative Timestamp of the Event: 0 x 100 milliseconds

Remote Client:

Symbol Period Error:

Window: 00 Symbol(s)
 Threshold: 00 Symbol(s)
 Last Window Symbols Errors: 00 Symbol(s)
 Total Symbols Errors: 00 Symbol(s)
 Total Symbols Errors Events: 0 Events(s)
 Relative Timestamp of the Event: 0 x 100 milliseconds

Frame Error:

Window: 0 x 100 milliseconds
 Threshold: 0 Error Frame(s)
 Last Window Frame Errors: 0 Frame(s)
 Total Frame Errors: 00 Frames(s)
 Total Frame Errors Events: 0 Events(s)
 Relative Timestamp of the Event: 0 x 100 milliseconds

Frame Period Error:

Window: 0 Frames
 Threshold: 0 Error Frame(s)
 Last Window Frame Errors: 0 Frame(s)
 Total Frame Errors: 00 Frames(s)
 Total Frame Period Errors Events: 0 Events(s)
 Relative Timestamp of the Event: 0 x 100 milliseconds

show ethernet oam discovery

Use this command to display the Ethernet OAM administrative and operation configuration for local and remote DTE.

Command Syntax

```
show ethernet oam discovery interface IFNAME
```

Parameter

interface	Specify the interface.
IFNAME	Specify the interface name.

Command Mode

Exec mode and Privileged Exec mode

Example

The following output displays ethernet OAM administrative and operation configurations for local and remote DTE.

```
#show ethernet oam discovery interface eth0
eth0
Local client:
-----
Administrative configurations:
  Mode:                passive
  Unidirection:        supported
  Link monitor:         supported(on)
  Remote Loopback:      supported
  MIB retrieval:        not supported
  MTU Size      :      1518
Operational status:
  Port status:          operational
  Loopback status:      no loopback
  PDU revision:         1
Remote client:
-----
MAC address: 0002.b3d5.93b7
Vendor(oui): 3 0 50

Administrative configurations:
  Mode:                active
  Unidirection:        supported
  Link monitor:         supported
  Remote Loopback:      supported
  MIB retrieval:        not supported
  MTU Size      :      1518
```

show ethernet oam eventlog

Use this command to display all event logs for an interface within given range.

Command Syntax

```
show ethernet oam eventlog IFNAME range-start <1-100> range-end <1-100>
```

Parameters

IFNAME	The name of the interface.
range-start	Starting range of log index.
<1-100>	Starting range of log index. This should not exceed the maximum log size.
range-end	Ending range of log index.
<1-100>	Ending range of log index. This should not exceed the maximum log size.

Command Mode

Exec mode and Privileged Exec mode

Example

The following displays an example of this command:

```
#show ethernet oam eventlog eth1 range-start 10
```

show ethernet oam statistics

Use this command to see the Ethernet OAM statistics.

Command Syntax

```
show ethernet oam statistics interface IFNAME
```

Parameter

interface	Specify the interface.
IFNAME	Specify the interface name.

Command Mode

Privileged Exec mode

Example

The following sample output from this command displays Ethernet OAM statistics for the interface named eth0.

```
#show ethernet oam statistics interface eth0
eth0
Counters:
-----
Information OAMPDU Tx           : 39
Information OAMPDU Rx           : 39
Event Notification OAMPDU Tx    : 0
Event Notification OAMPDU Rx    : 0
Loopback Control OAMPDU Tx     : 0
Loopback Control OAMPDU Rx     : 0
Unsupported OAMPDU Rx          : 0
Local event logs:
-----
  0 Errored Symbol Period records
  0 Errored Frame records
  0 Errored Frame Period records
  0 Errored Frame Seconds records
Remote event logs:
-----
  0 Errored Symbol Period records
  0 Errored Frame records
  0 Errored Frame Period records
  0 Errored Frame Seconds records
```

show ethernet oam status

Use this command to display the ethernet OAM and link monitoring status of the interface.

Command Syntax

```
show ethernet oam status interface IFNAME
```

Parameter

interface	Specify the interface.
IFNAME	Specify the interface name.

Command Mode

Privileged Exec mode

Example

The following sample output displays the operational discovery state machine and link event statistics of the interface.

```
#show ethernet oam status interface eth0
eth0
General:
  Mode:                passive
  PDU max rate:        10 packets per second
  PDU min rate:        1 packet per 1 second
  Link timeout:        5 seconds
  High threshold action: no action
Link Monitoring:
  Status:              supported(on)
  Symbol Period Error:
    Window:            100 million symbols
    Low threshold:     0 error symbol(s)
    High threshold:    none
  Frame Error:
    Window:            100 x 100 milliseconds
    Low threshold:     1 error frame(s)
    High threshold:    none
  Frame Period Error:
    Window:            1000 x 100,000 frames
    Low threshold:     1 error frame(s)
    High threshold:    none
  Frame Seconds Error:
    Window:            1000 x 100 milliseconds
    Low threshold:     1 error second(s)
    High threshold:    none
```

snmp restart efm

Use this command to restart SNMP in EFM-OAM

Command Syntax

```
snmp restart efm
```

Parameters

None

Command Mode

Configure mode

Examples

```
(config)#snmp restart efm-oam
```


CHAPTER 4 Link Layer Discovery Protocol Commands

This chapter describes the Link Layer Discovery Protocol (LLDP) commands.

- [lldp debug](#)
- [lldp ip](#)
- [lldp tlv](#)
- [set lldp chassis-id-tlv](#)
- [set lldp disable](#)
- [set lldp enable](#)
- [set lldp locally-assigned](#)
- [set lldp management-address-tlv](#)
- [set lldp msg-tx-hold](#)
- [set lldp system-description](#)
- [set lldp system-name](#)
- [set lldp timer](#)
- [set lldp too-many-neighbors](#)
- [show lldp](#)
- [snmp restart lldp](#)

lldp debug

Use this command to set the debugging functions for LLDP.

Use the no form of this command to turn off LLDP debugging functions

Command Syntax

```
lldp debug (event|rx|tx|message)
no lldp debug (event|rx|tx|message)
```

Parameters

event	Enable or disable event debugging
message	Enable or disable NSM message debugging
rx	Enable or disable RX debugging
tx	Enable or disable TX debugging

Command Mode

Exec mode and Privileged Exec mode

Examples

```
#lldp debug event
#lldp debug messages
```

lldp ip

Use this command to set the Link Layer Discovery Protocol with an IP address to be used as a chassis and management ID.

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

Command Syntax

```
lldp ip address A.B.C.D
no lldp ip address
```

Parameters

A.B.C.D Enter the IP address value

Command Mode

Configure mode

Examples

```
#configure terminal
(config)#lldp ip address 1.1.1.1
(config)#no lldp ip address
```

lldp tlv

Use this command to set the TLVs enabled for transmission on a port. Make sure that the complete set of Type Length Values (TLVs) is specified when giving this command, because TLVs not specified are disabled.

Command Syntax

```
lldp tlv {chassis-id|port-id|ttl|port-description|system-name|system-  
description|system-capabilities|management-address|ieee-8021-org-specific|ieee-  
8023-org-specific}
```

Parameters

chassis-id	Chassis ID type length values (TLV)
port-id	Port ID TLV
ttl	Time to live TLV
port-description	Port description TLV
system-name	System name TLV
system-description	System Description
system-capabilities	System capabilities TLV
management-address	Management address TLV
ieee-8021-org-specific	IEEE 802.1 organizationally-specific TLV
ieee-8023-org-specific	IEEE 802.3 organizationally-specific TLV

Command Mode

Interface mode

Example

```
#configure terminal  
(config)#interface eth0  
(config-if)#lldp tlv chassis-id ieee-8021-org-specific ieee-8023-org-specific  
management-address port-description port-id system-capabilities system-  
description system-name ttl
```

set lldp chassis-id-tlv

Use this command to set the chassis ID subtype for the LLDP agent on a port.

Command Syntax

```
set lldp chassis-id-tlv (mac-address | ip-address)
```

Parameters

mac-address	Use the MAC address as the chassis ID
ip-address	Use the management IP address as the chassis ID

Command Mode

Interface mode

Examples

```
#configure terminal
(config)#interface eth0
(config-if)#set lldp chassis-id-tlv ip-address
```

set lldp disable

Use this command to disable the LLDP agent on a port.

Command Syntax

```
set lldp disable
```

Parameters

None

Command Mode

Interface mode

Examples

```
#configure terminal
(config)#interface eth0
(config-if)#set lldp disable
```

set lldp enable

Use this command to enables an LLDP agent on a port and specifies its type.

Command Syntax

```
set lldp enable (txonly|txrx|rxonly)
```

Parameters

rxonly	Receive-only
txonly	Transmit-only
txrx	Transmit and receive

Default

By default, no LLDP agent is enabled for a port.

Command Mode

Interface mode

Examples

```
#configure terminal
(config)#interface eth 0
(config-if)#set lldp enable txrx
```

set lldp locally-assigned

Use this command to locally assign the LLDP Port ID and the Chassis ID TLV parameters.

Command Syntax

```
set lldp locally-assigned NAME
```

Parameters

NAME	Name assigned to the port.
------	----------------------------

Command Mode

Interface mode

Examples

```
#configure terminal
(config)#interface eth 0
(config-if)#set lldp locally-assigned port1
```

set lldp management-address-tlv

Use this command to set the management address subtype for the LLDP agent on a port.

Command Syntax

```
set lldp management-address-tlv (mac-address | ip-address)
```

Parameters

mac-address	Use the MAC address as the chassis ID
ip-address	Use the management IP address as the chassis ID

Command Mode

Interface mode

Examples

```
#configure terminal
(config)#interface eth 0
(config-if)#set lldp management-address-tlv ip-address
```

set lldp msg-tx-hold

Use this command to set the `msg-tx-hold` parameter that determines the Time To Live (TTL) value for LLDPDUs to be transmitted by the port. The value set with this command is multiplied by the `lldp timer msg-tx-interval` value, which determines the final TTL value.

Command Syntax

```
set lldp msg-tx-hold VALUE
```

Parameters

VALUE	Time in seconds of LLDP msg-tx-hold
-------	-------------------------------------

Default

The default value of the `lldp msg-tx-hold` parameter is 4 seconds.

Command Mode

Interface mode

Examples

```
#configure terminal
(config)#interface eth0
(config)#set lldp msg-tx-hold 3
```

set lldp system-description

Use this command to identify the string that describes the LLDP system.

Command Syntax

```
set lldp system-description LINE
unset lldp system-description
```

Parameters

LINE	Set the description of the LLDP system.
------	---

Default

The default status of Ethernet OAM is disabled.

Command Mode

Configure mode

Example

```
#configure terminal
(config)#set lldp system-description LLDP agent on B1

(config)#unset lldp system-description
```

set lldp system-name

Use this command to identify the system name of the LLDP function.

Command Syntax

```
set lldp system-name NAME
unset lldp system-name
```

Parameters

NAME	Name of the LLDP system.
------	--------------------------

Command Mode

Configure mode

Example

```
#configure terminal
(config)#set lldp system-name LLDP1

(config)#unset lldp system-name
```

set lldp timer

Use this command to set the interval at which LLDP frames are transmitted.

Command Syntax

```
set lldp timer msg-tx-interval <5-32768>
set lldp timer reinitDelay VALUE
set lldp timer tx-delay <1-8192>
```

Parameters

msg-tx-interval	Set the message transmit interval value
<5-32768>	Set the message transmit interval value
reinitDelay	Set the reinit delay value
VALUE	Set the reinit delay value
tx-delay	Set the transmit delay value
<1-8192>	Set the transmit delay value in range of: (1 <= tx-delay <= ((0.25)* msg-tx-interval))

Default Values

The default value for `msg-tx-interval` is 30 seconds.

The default value for `reinitDelay` is 2 seconds.

The default value of the `tx-delay` is 2 seconds.

Command Mode

Interface mode

Examples

```
#configure terminal
(config)#interface eth0
(config-if)#set lldp timer msg-tx-interval 40

#configure terminal
(config)#interface eth0
(config-if)#set lldp timer reinitDelay 3

#configure terminal
(config)#interface eth0
(config-if)#set lldp timer tx-delay 3
```

set lldp too-many-neighbors

Use this command to set the action to take when the remote table is full.

Command Syntax

```
set lldp too-many-neighbors limit <1-65535> discard received-info timer <1-65535>
set lldp too-many-neighbors limit <1-65535> discard existing-info MAC
timer <1-65535>
```

Parameters

limit	The limit on the number of LLDP neighbors.
<1-65535>	The limit on the number of LLDP neighbors.
received-info	The information received for this neighbor.
timer	The period after which received information is discarded.
<1-65535>	The period in seconds after which received information is discarded.
existing-info	The information for this neighbor.
MAC	Identifies the remote LLDP Agent for which information is discarded.
timer	The period in seconds after which existing information is discarded.
<1-65535>	The period in seconds after which existing information is discarded.

Default Value

No upper limit is enforced for the number of remote LLDP agents.

Command Mode

Interface mode

Examples

```
#configure terminal
(config)#interface eth1
(config-if)#set lldp too-many-neighbors limit 20 disc existing-info 1.1.1.1.1
timer 1

(config)#interface eth1
(config-if)#set lldp too-many-neighbors limit 1 discard received-info timer 1
```

show lldp

Use this command to display LLDP port information.

Command Syntax

```
show lldp port IFNAME
show lldp port IFNAME statistics
```

Parameters

IFNAME	The name of the interface
statistics	Display LLDP port statistics

Command Mode

Exec mode and Privileged Exec mode

Example

The following sample output from this command displays detailed information about an LLDP-enabled port.

```
#show lldp port eth0
Remote LLDP
MAC Address: 01:06:29:CF:79:A1
TTL: 60
Network Address: 192.168.1.0
Interface Name: eth1
Interface Locally Assigned String: Port-a
Interface Description: bridge
Interface Number: 2
Port Vlan ID: 1
Protocol ID: 274242030202
AutoNego Support: Supported
AutoNego Capability: 1
Operational MAU Type: 3
/* PoE Feature Starts */
Power via MDI Capability (raw data):
(Use command [show poe port remote] for details):
  MDI power support: 0x0
  PSE power pair: 0x0
  Power class: 0x0
  Type/source/priority: 0x0
  PD requested power value: 0x0
  PSE allocated power value: 0x0
/* PoE Feature Ends*/
Link Aggregation Status: Capable
Link Aggregation Port ID: 0
Max Frame Size: 128
System name: zebos
System Description: bridge
System Capabilities: 4
System Capabilities Enabled: 4
```

The following sample output from this command displays all LLDP statistics for a selected port.

```
#show lldp port eth0 statistics
LLDP Port statistics for eth0
Frames transmitted: 22
Frames Aged out: 0
Frames Discarded: 0
Frames with Error: 0
Frames Received: 5
TLVs discarded: 0
TLVs unrecognized 0
```

snmp restart lldp

Use this command to restart SNMP in Link Layer Discovery Protocol (LLDP)

Command Syntax

```
snmp restart lldp
```

Parameters

None

Command Mode

Configure mode

Examples

```
#snmp restart lldp
```


CHAPTER 5 Link Layer Discovery Protocol v2 Commands

The commands in this chapter support:

- Link Layer Discovery Protocol (LLDP) version 2 as described in IEEE 802.1AB 2009
- LLDP-MED protocol extension as per ANSI/TIA-1057 April 2006.

Note: To enable LLDPv2, LLDP (previous version) should be disabled or vice versa.

- `clear lldp counters`
- `lldp agent`
- `lldp debug`
- `set lldp agt-circuit-id`
- `set lldp enable`
- `set lldp chassis-id-tlv`
- `set lldp disable`
- `set lldp locally-assigned`
- `set lldp management-address-tlv`
- `set lldp med-devtype`
- `set lldp msg-tx-hold`
- `set lldp port-description`
- `set lldp port-id-tlv`
- `set lldp timer`
- `set lldp too-many-neighbors`
- `lldp tlv-select`
- `lldp tlv-select med`
- `lldp tlv-select basic-mgmt`
- `lldp tlv-select ieee-8021-org-specific`
- `lldp tlv-select ieee-8023-org-specific`
- `set lldp system-description`
- `set lldp system-name`
- `set lldp tx-fast-init`
- `set lldp tx-max-credit`
- `show lldp debugging`
- `show lldp interface`
- `snmp restart lldp`

clear lldp counters

Use this command to clear the LLDP statistics on all the interfaces.

Command Syntax

```
clear lldp counters
```

Parameters

<code>counters</code>	Reset the LLDP traffic counters to zero.
-----------------------	--

Command Mode

Exec Mode

Examples

```
#clear lldp counters
```

lldp agent

Use this command to create an LLDP agent mode.

Use the `no` parameter to revert to default settings.

Command Syntax

```
lldp-agent (non-tmpr-bridge |customer-bridge| )
no lldp-agent (non-tmpr-bridge |customer-bridge| )
```

Parameters

non-tmpr-bridge	
	non-tpmr-bridge
customer-bridge	
	customer-bridge

Default

By default LLDP agent is disabled.

Command Mode

Interface Mode

Examples

```
#configure terminal
(config)#int eth0
(config-if)#lldp-agent customer-bridge

(config-if)#no lldp-agent customer-bridge
(config-if)#exit
```

lldp debug

Use this command to set the debugging functions for LLDP.

Use the no form of this command to turn off LLDP debugging functions

Command Syntax

```
lldp debug (event|rx|tx|message)
no lldp debug (event|rx|tx|message)
```

Parameters

event	Enable or disable event debugging
message	Enable or disable NSM message debugging
rx	Enable or disable RX debugging
tx	Enable or disable TX debugging

Command Mode

Exec mode and Privileged Exec mode

Examples

```
#lldp debug event
#lldp debug messages
```

set lldp agt-circuit-id

Use this command to configure LLDP agt-circuit-id.

Command Syntax

```
set lldp agt-circuit-id VALUE
```

Parameters

VALUE Specify LLDP global agt-circuit ID.

Command Mode

Interface mode

Examples

```
(config)#int eth0
(config-if)#set lldp agt-circuit-id sample
```

set lldp enable

Use this command to set the admin status of a LLDP agent on a port.

Command Syntax

```
set lldp enable (txonly|txrx|rxonly)
```

Parameters

rxonly	Receive-only
txonly	Transmit-only
txrx	Transmit and receive

Default

By default, no LLDP agent is enabled for a port.

Command Mode

LLDP Agent mode

Examples

```
#configure terminal
(config)#int eth0
(config-if)#lldp-agent
(lldp-agent)#set lldp enable txrx
(lldp-agent)#exit
```

set lldp chassis-id-tlv

Use this command to set the chassis ID subtype for the LLDP agent on a port.

Use no form of this command to unset the chassis ID subtype.

Command Syntax

```
set lldp chassis-id-tlv (if-alias | ip-address | mac-address | if-name | locally-
assigned)
no set lldp chassis-id-tlv
```

Parameters

mac-address	Use the MAC address as the chassis ID
ip-address	Use the management IP address as the chassis ID
if-alias	Use the IP address as the chassis ID
if-name	Use the interface name as the chassis ID
locally-assigned	Use the locally assigned value as the chassis ID

Command Mode

LLDP Agent mode

Examples

```
#configure terminal
(config)#int eth0
(config-if)#lldp-agent
(lldp-agent)#set lldp chassis-id-tlv ip-address
(lldp-agent)#no set lldp chassis-id-tlv
```

set lldp disable

Use this command to disable the admin status of a LLDP agent on a port.

Command Syntax

```
set lldp disable
```

Parameters

None

Command Mode

LLDP Agent mode

Examples

```
#configure terminal
(config)#int eth0
(config-if)#lldp-agent
(lldp-agent)#set lldp disable
(lldp-agent)#exit
```

set lldp locally-assigned

Use this command to set the locally assigned name for LLDP interface.

Use no form of this command to remove the locally assigned name for LLDP interface.

Command Syntax

```
set lldp locally-assigned NAME
no set lldp locally-assigned NAME
```

Parameters

NAME	Name assigned to the port.
------	----------------------------

Command Mode

Interface mode

Examples

```
#configure terminal
(config)#interface eth 0
(config-if)#set lldp locally-assigned port1
(config-if)#no set lldp locally-assigned
```

set lldp management-address-tlv

Use this command to set the sub type of the Management Address TLV.

Use `no` form of this command to unset the sub type of the Management Address TLV.

Command Syntax

```
set lldp management-address-tlv (mac-address | ip-address)
no set lldp management-address-tlv
```

Parameters

<code>mac-address</code>	Use the MAC address as the Management Address.
<code>ip-address</code>	Use the management IP address as the Management Address.

Command Mode

LLDP Agent mode

Examples

```
#configure terminal
(config)#int eth0
(config-if)#lldp-agent
(lldp-agent)#set lldp management-address-tlv ip-address
(lldp-agent)#no set lldp management-address-tlv
```

set lldp med-devtype

Use this command to configure the LLDP device type as Network-Connectivity/ End-Point Class1/ End-Point Class2/ End-Point Class3 device.

Use the `no` parameter to un set the configured LLDP device type.

Command Syntax

```
set lldp med-devtype (net-connect| ep-class1| ep-class2| ep-class3)
no lldp med-devtype (net-connect| ep-class1| ep-class2| ep-class3)
```

Parameters

<code>net-connect</code>	Set device type as Network-Connectivity
<code>ep-class1</code>	Set device type as End-Point Class1
<code>ep-class2</code>	Set device type as End-Point Class2
<code>ep-class3</code>	Set device type as End-Point Class3

Default

None

Command Mode

Interface mode

Examples

```
#configure terminal
(config)#int eth0
(config-if)#set lldp med-devtype ep-class1
(config-if)#exit

#configure terminal
(config)#int eth0
(config-if)#no set lldp med-devtyp
(config-if)#exit
```

set lldp msg-tx-hold

Use this command to set the `msg-tx-hold` parameter that determines the Time To Live (TTL) value for LLDPDUs to be transmitted by the port. The value set with this command is multiplied by the `lldp timer msg-tx-interval` value, which determines the final TTL value.

Use `no` form of this command to set the default value of message transmit hold.

Command Syntax

```
set lldp msg-tx-hold VALUE
no set lldp msg-tx-hold
```

Parameters

`VALUE` Specify time in seconds in the range of `<1-100>` to set message transmit hold.

Default

The default value of message transmit hold is 4 seconds.

Command Mode

LLDP Agent mode

Examples

```
(config)#int eth0
(config-if)#lldp-agent
(lldp-agent)#set lldp msg-tx-hold 3
(lldp-agent)#no set lldp msg-tx-hold
```

set lldp port-description

Use this command to configure LLDP information.

Command Syntax

```
set lldp port-description LINE
```

Parameters

LINE	Specify LLDP port description.
------	--------------------------------

Command Mode

Interface mode

Examples

```
(config)#int eth0
(config-if)#set lldp port-description new
```

set lldp port-id-tlv

Use this command to set the sub type of the Port ID.

Use `no` form of this command to unset the sub type of the Port ID.

Command Syntax

```
set lldp port-id-tlv (if-alias | ip-address | mac-address | if-name | agt-circuit-id | locally-assigned)
no set lldp port-id-tlv
```

Parameters

mac-address	Use the MAC address as the port-id-tlv.
ip-address	Use the management IP address as the port-id-tlv
if-alias	Use the IP alias as the port-id-tlv
if-name	Use the interface name as the port-id-tlv
agt-circuit-id	Use the agt-circuit-id name as the port-id-tlv
locally-assigned	Use the locally assigned value as the port-id-tlv

Command Mode

LLDP Agent mode

Examples

```
(config)#int eth0
(config-if)#lldp-agent
(lldp-agent)#set lldp port-id-tlv ip-address
(lldp-agent)#no set lldp port-id-tlv
```

set lldp timer

Use this command to set the interval at which LLDP frames are transmitted.

Use `no` form of this command to set the default value for timer.

Command Syntax

```
set lldp timer msg-fast-tx <1-3600>
set lldp timer msg-tx-interval <5-3600>
set lldp timer reinit-Delay VALUE
no set lldp timer msg-fast-tx
no set lldp timer msg-tx-interval
no set lldp timer reinit-Delay
```

Parameters

<code>msg-fast-tx</code>	Set the value in range <1-3600>
<code>msg-tx-interval</code>	Set the value in range <5-3600>
<code>reinitDelay</code>	Set the value in range <1-10>

Default Values

The default value for `msg-fast-tx` is 1 second.

The default value for `msg-tx-interval` is 30 seconds.

The default value for `reinitDelay` is 2 seconds.

Command Mode

LLDP Agent mode

Examples

```
#configure terminal
(config)#int eth0
(config-if)#lldp-agent
(lldp-agent)#set lldp timer msg-fast-tx 40
(lldp-agent)#no set lldp timer msg-fast-tx
(lldp-agent)#exit

#configure terminal
(config)#int eth0
(config-if)#lldp-agent
(lldp-agent)#set lldp timer msg-tx-interval 40
(lldp-agent)#no set lldp timer msg-tx-interval
(lldp-agent)#exit

#configure terminal
(config)#int eth0
(config-if)#lldp-agent
(lldp-agent)#set lldp timer reinitDelay 3
```

```
(lldp-agent)#no set lldp timer reinitDelay  
(lldp-agent)#exit
```

set lldp too-many-neighbors

Use this command to set the action to take when the remote table is full.

Use no form of this command to unset too many neighbors parameters.

Command Syntax

```
set lldp too-many-neighbors limit <1-65535> discard received-info timer <1-65535>
set lldp too-many-neighbors limit <1-65535> discard existing-info MAC timer <1-65535>
no set lldp too-many-neighbors limit
```

Parameters

limit	The limit on the number of LLDP neighbors.
<1-65535>	Upper limit for the number of Remote LLDP Information.
received-info	The information received for this neighbor.
timer	The period after which received information is discarded.
<1-65535>	The period in seconds after which received information is discarded.
existing-info	The information for this neighbor.
MAC	Identifies the remote LLDP Agent for which information is discarded.
timer	The period in seconds after which existing information is discarded.
<1-65535>	The period in seconds after which existing information is discarded.

Default Value

No upper limit is enforced for the number of remote LLDP agents.

Command Mode

Interface mode

Examples

```
#configure terminal
(config)#interface eth1
(config-if)#lldp-agent
(lldp-agent)#set lldp too-many-neighbors limit 20 disc existing-info 1.1.1.1.1
timer 1

(config)#interface eth1
(config-if)#lldp-agent
(lldp-agent)#set lldp too-many-neighbors limit 1 discard received-info timer 1
```

lldp tlv-select

Use this command to select the set of optional TLV's to be included in the LLDP frames.

Use the `no` parameter to disable the selected set of optional TLV's.

Command Syntax

```
lldp tlv-select {basic-mgmt| ieee-8021-org-specific| ieee-8023-org-specific}
no lldp tlv-select {basic-mgmt| ieee-8021-org-specific| ieee-8023-org-specific}
```

Parameters

<code>basic-mgmt</code>	Basic management specific TLV.
<code>ieee-8021-org-specific</code>	IEEE 802.1 organizationally-specific TLV.
<code>ieee-8023-org-specific</code>	IEEE 803.1 organizationally-specific TLV

Default Value

None

Command Mode

LLDP Agent mode

Examples

```
#configure terminal
(config)#interface eth0
(config-if) lldp-agent
(lldp-agent)#lldp tlv-select basic-mgmt
(lldp-agent)#exit
```

lldp tlv-select med

Use this command to select the set of optional TLV's which can enabled for transmission.

Use the `no` parameter to disable the selected set of optional TLV's.

Command Syntax

```
lldp tlv-select med (media-capabilities | network-policy| location | extended-  
power-via-mdi | inventory|)  
  
no lldp tlv-select med (media-capabilities | network-policy| location | extended-  
power-via-mdi | inventory|)
```

Parameters

<code>network-policy</code>	Select the Network-policy as optional TLV
<code>media-capabilities</code>	Select the Media-capabilities as optional TLV
<code>location</code>	Select the Location as optional TLV
<code>extended-power-via-mdi</code>	Select the extended-power-via-mdi as optional TLV, when PoE feature is available
<code>inventory</code>	Select the Inventory as optional TLV

Default Value

None

Command Mode

LLDP Agent mode

Examples

```
#configure terminal  
(config)#interface eth0  
(config-if)lldp-agent  
(lldp-agent)#lldp tlv-select network-policy  
(lldp-agent)#exit
```

lldp tlv-select basic-mgmt

Use this command to select the set of basic management TLV's to be included in the LLDP frames.

Use the `no` parameter to disable selected set of basic management TLV's.

Command Syntax

```
lldp tlv-select basic-mgmt {port-description| system-name| system-description/  
system-capabilities| management-address}  
  
no lldp tlv-select basic-mgmt {port-description| system-name| system-description/  
system-capabilities| management-address}
```

Parameters

port-description	Port description specific TLV
system-name	System name specific TLV
system-description	System Description specific TLV
system-capabilities	System capabilities specific TLV
management-address	Management address specific TLV

Default Value

None

Command Mode

LLDP Agent mode

Examples

```
#configure terminal  
(config)#interface eth0  
(config-if)lldp-agent  
(lldp-agent)#lldp tlv-select basic-mgmt system-name  
(lldp-agent)#exit
```

lldp tlv-select ieee-8021-org-specific

Use this command to select the set of ieee-8021-org-specific TLV to be included in the LLDP frames.

Use the `no` parameter to disable the selected set of ieee-8021-org-specific TLV.

Command Syntax

```
lldp tlv-select ieee-8021-org-specific {port-vlanid| port-ptcl-vlanid| vlan-name|
ptcl-identity| vid-digest| mgmt-vid| link-agg}

no lldp tlv-select ieee-8021-org-specific {port-vlanid| port-ptcl-vlanid| vlan-
name| ptcl-identity| vid-digest| mgmt-vid| link-agg}
```

Parameters

link-agg	Select link-aggregation TLV
mgmt-vid	Select management vlan identifier TLV
port-ptcl-vlanid	Select port protocol vlan identifier TLV
port-vlanid	Select port vlan identifier TLV
ptcl-identity	Select protocol-identifier TLV
vid-digest	Select vlan identifier digest TLV
vlan-name	Select vlan name TLV

Default Value

None

Command Mode

LLDP Agent mode

Examples

```
#configure terminal
(config)#interface eth0
(config-if)lldp-agent
(lldp-agent)#lldp tlv-select ieee-8021-org-specific port-vlanid
(lldp-agent)#exit
```

lldp tlv-select ieee-8023-org-specific

Use this command to select the set of ieee-8023-org-specific TLV to be included in the LLDP frames.

Use the `no` parameter to disable the selected ieee-8023-org-specific TLV.

Command Syntax

```
lldp tlv-select ieee-8023-org-specific {mac-phy| power-via-mdi | max-mtu- size}
no lldp tlv-select ieee-8023-org-specific {mac-phy| power-via-mdi | max- mtu-size}
```

Parameters

<code>mac-phy</code>	VLAN ID Of the provider edge port <2-4094>.
<code>power-via-mdi</code>	Power-via-MDI (only when PoE feature is available)
<code>max-mtu-size</code>	max-mtu-size TLV

Default Value

None

Command Mode

LLDP Agent mode

Examples

```
#configure terminal
(config)#interface eth0
(config-if)lldp-agent
(lldp-agent)#lldp tlv-select ieee-8023-org-specific mac-phy
(lldp-agent)#exit
```

set lldp system-description

Use this command to identify the string that describes the LLDP system.

Use no form of this command to unset the system description.

Command Syntax

```
set lldp system-description LINE
unset lldp system-description
```

Parameters

LINE	Set the description of the LLDP system.
------	---

Command Mode

Configure mode

Example

```
#configure terminal
(config)#set lldp system-description LLDP agent on B1
(config)#unset lldp system-description
```

set lldp system-name

Use this command to identify the system name of the LLDP function.

Use no form of this command to unset the system name.

Command Syntax

```
set lldp system-name NAME
unset lldp system-name
```

Parameters

NAME	Name of the LLDP system.
------	--------------------------

Command Mode

Configure mode

Example

```
#configure terminal
(config)#set lldp system-name LLDP1
(config)#unset lldp system-name
```

set lldp tx-fast-init

Use this command to determine the maximum value of LLDP frames that are transmitted during a fast transmission period.

Use `no` form of this command to set fast transmission period to default value.

Command Syntax

```
set lldp tx-fast-init <1-8>
no set lldp tx-fast-init
```

Parameters

`tx-fast-init` Set the message transmit interval value <1-8>.

Default Value

Default value is 4.

Command Mode

LLDP Agent mode

Examples

```
#configure terminal
(config)#int eth0
(config-if)#lldp-agent
(lldp-agent)#set lldp tx-fast-init 4
(lldp-agent)#no set lldp tx-fast-init
(lldp-agent)#exit
```

set lldp tx-max-credit

Use this command to set the maximum value of transmission credit, which signifies the number of consecutive LLDP frames transmitted.

Use `no` form of this command to set the maximum value of transmission credit to default value.

Command Syntax

```
set lldp tx-max-credit <1-10>
no set lldp tx-max-credit
```

Parameters

`tx-max-credit` The maximum value of transmission credit.

Default Value

Default value is 5

Command Mode

LLDP Agent mode

Examples

```
#configure terminal
(config)#interface eth0
(config-if)lldp-agent
(lldp-agent)#set lldp tx-max-credit <1-10>
(lldp-agent)#no set lldp tx-max-credit
(lldp-agent)#exit
```

show lldp debugging

Use this command to display LLDP debugging information.

Command Syntax

```
show debugging lldp
```

Parameters

None

Command Mode

Exec mode and Privileged Exec mode

Example

The following sample output displays information about an LLDP debugging.

```
#show debugging lldp
LLDP debugging status:
  LLDP message debugging is on
```

show lldp interface

Use this command to display LLDP interface information.

Command Syntax

```
show lldp interface IFNAME (nearest-bridge| non-tpmr-bridge| customer-bridge | )
    (neighbor| )
```

Parameters

interface-name	Display LLDP interface information for all agent
nearest-bridge	Display LLDP nearest bridge information
non-TPMR-bridge	Display LLDP non-TPMR-bridge information
customer-bridge	Display LLDP customer-bridge information
neighbor	Display LLDP neighbor details.

Command Mode

Exec mode and Privileged Exec mode

Example

The following sample output displays information about an LLDP-enabled port.

```
#show lldp interface eth0
Agent Mode : Customer-bridge
Enable (tx/rx): N/N
MED Enabled :N
Device Type: NOT_DEFINED
LLDP Agent traffic statistics:
Total frames transmitted: 0
Total entries aged: 0
Total frames recieved: 0
Total frames received in error: 0
Total frames discarded: 0
Total discarded TLVs: 0
Total unrecognised TLVs: 0

Agent Mode : Non-TPMR-bridge
Enable (tx/rx): N/N
MED Enabled :N
Device Type: NOT_DEFINED
LLDP Agent traffic statistics:
Total frames transmitted: 0
Total entries aged: 0
Total frames recieved: 0
```


Total frames received in error: 0
Total frames discarded: 0
Total discarded TLVs: 0
Total unrecognised TLVs: 0

Agent Mode : Nearest bridge
Enable (tx/rx): Y/Y
MED Enabled :N
Device Type: NOT_DEFINED
LLDP Agent traffic statistics:
Total frames transmitted: 2495
Total entries aged: 0
Total frames recieved: 0
Total frames received in error: 0
Total frames discarded: 0
Total discarded TLVs: 0
Total unrecognised TLVs: 0

CHAPTER 6 MEF User Network Interface Commands

This chapter contains the commands used for the Metro Ethernet Forum User Network Interface (MEF UNI). It includes the following commands:

Note: MEF-UNNI is not supported for ZebIC releases.

- `ce-vlan`
- `ethernet max-uni`
- `ethernet svlan evc-id`
- `ethernet uni`
- `ethernet uni id`
- `ethernet uni type`
- `l2protocol`
- `show ethernet uni bundling`
- `show ethernet uni evc`
- `show ethernet uni evc-id`
- `show ethernet uni list`
- `show ethernet uni max-evc`
- `show ethernet uni type`

ce-vlan

Use this command to configure Customer Edge (CE) VLAN class of service (COS) preservation for a particular SVLAN.

Use the `no` for of this command to unset preserve-cos.

Command Syntax

```
ce-vlan preserve-cos VLAN_ID
ce-vlan preserve-cos VLAN_ID bridge <1-32>
no ce-vlan preserve-cos VLAN_ID
no ce-vlan preserve-cos VLAN_ID bridge <1-32>
```

Parameters

VLAN_ID	Specify the VLAN ID of the service VLAN <1-4094>
bridge	Specify a bridge.
<1-32>	Specify a bridge ID.

Command Mode

Configure mode

Examples

```
#configure terminal
(config)#ce-vlan preserve-cos 2

#configure terminal
(config)#no ce-vlan preserve-cos 2
```

ethernet max-uni

Use this command to set the maximum number of UNIs for a SVLAN or EVC.

Use the `no` for of this command to remove the maximum number of UNIs for a SVLAN or EVC.

Command Syntax

```
ethernet (svlan <2-4094> | evc EVCID) max-uni <1-32> (bridge <1-32>|)
no ethernet (svlan <2-4094> | evc EVCID) max-uni (bridge <1-32>|)
```

Parameters

svlan	Service VLAN
<2-4094>	Service VLAN identifier
evc	EVC
EVCID	EVC identifier
max-uni	Maximum number of UNIs
<1-32>	For a point-to-point SVLAN, the maximum number of UNIs is 2; for a multipoint-to-multipoint or rooted multipoint SVLAN, the maximum number of UNIs is greater than 2
bridge	Bridge
<1-32>	Bridge identifier

Command Mode

VLAN configuration mode

Examples

```
#configure terminal
(config)#vlan database
(config-vlan)#ethernet svlan 5 evc 22 max-uni 2 bridge 7
```

ethernet svlan evc-id

Use this command to set the EVC identifier for an SVLAN.

Use the `no` for of this command to remove the EVC identifier for an SVLAN.

Command Syntax

```
ethernet svlan <2-4094> ((evc-id EVC_ID) | (ovc-id OVC_ID oep-id OEP_ID)) (bridge <1-32>|)
```

```
no ethernet svlan <2-4094> ((evc-id EVC_ID) | (ovc-id OVC_ID )) (bridge <1-32>|)
```

Parameters

<2-4094>	Service VLAN identifier
evc-id	EVC
EVC_ID	EVC identifier
bridge	Bridge
<1-32>	Bridge identifier
ovc-id	Specify the OVC ID for the SVLAN

Command Mode

VLAN configuration mode

Examples

```
#configure terminal
(config)#vlan database
(config-vlan)#ethernet svlan 5 evc-id 22 bridge 7
```

ethernet uni

Use this command to configure service multiplexing and bundling for an UNI.

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

Command Syntax

```
ethernet uni (bundle | all-to-one | multiplex)
no ethernet uni (bundle | all-to-one | multiplex)
```

Parameters

<code>bundle</code>	CVLAN registration table with only one SVLAN supported on the UNI. Multiple CVLANs can be mapped to the SVLAN.
<code>all-to-one</code>	CVLAN registration table with only one SVLAN supported on the UNI. All CVLANs must be mapped to the SVLAN.
<code>multiplex</code>	UNI supports multiplexing without bundling (one or more) SVLANs with a single CVLAN mapped to each SVLAN.

Command Mode

Interface mode

Examples

```
#configure terminal
(config)#interface eth1
(config-if)#ethernet uni bundle

(config)#interface eth1
(config-if)#ethernet uni id new-UNI

(config)#interface eth1
(config-if)#ethernet uni multiplex
```

ethernet uni id

Use this command to set the name of an UNI.

Use the `no` option with this command to delete an UNI name.

Command Syntax

```
ethernet uni id NAME (type (root|leaf) (svlan <2-4094>|evc-id EVCID)|)  
no ethernet uni id NAME (svlan-id <2-4096>|evc-id EVCID|)
```

Parameters

<code>id</code>	UNI identifier
<code>NAME</code>	UNI identifier <1-64>
<code>type</code>	Whether the UNI is <code>root</code> or <code>leaf</code> :
<code>root</code>	The UNI can send service frames to all other points in the EVC
<code>leaf</code>	The UNI can send and receive and service frames to and from <code>root</code> only
<code>svlan</code>	SVLAN
<code><2-4094></code>	SVLAN identifier
<code>evc</code>	EVC
<code>EVC_ID</code>	EVC identifier

Command Mode

Interface mode

Examples

```
#configure terminal  
(config)#interface eth1  
(config-if)#ethernet uni id fred type root svlan 5
```

ethernet uni type

Use this command to enable or disable the UNI Type on both the UNI-C and the UNI-N at a global level. When a user enables a UNI type, the UNI Type (such as 2.2, 2.1 or 1) is updated based on the CFM and E-LMI convergence. When UNI Type is disabled, the UNI-Type set to the default (UNI Type 1), but the CFM and E-LMI operational status is maintained and displayed in the show command.

The UNI Type can be enabled globally or on an interface basis. When the UNI Type is enabled globally, it is enabled on all Customer Edge Ports (UNI-Ns) of Provider Edge Bridge and on all Ports (UNI-Cs) of Customer Network.

Command Syntax

```
ethernet uni type (enable | disable) (bridge <1-32>|)
```

Parameters

<code>disable</code>	Set the UNI type to disable. This sets the UNI type to the default
<code>enable</code>	Set the UNI type to enable. This updates the UNI type.
<code>bridge</code>	Specify a bridge.
<code><1-32></code>	Specify a bridge ID.

Command Mode

Configure mode

Default

UNI is disabled by default.

Example

```
#configure terminal
(config)#ethernet uni type enable bridge 1
(config)#
```

l2protocol

Use this command to configure the protocol handling on a customer edge/customer network port.

Command Syntax

```
l2protocol (stp|lacp|efm|dot1x|elmi|lldp|ptp|synce|gvrp|mvrp|gmrp|mmrp) tunnel
(vlan VLAN_ID |)

l2protocol (stp|pause|lacp|efm|dot1x|elmi|lldp|ptp|synce) discard

l2protocol (stp|lacp|efm|dot1x|elmi|lldp|ptp|synce|gmrp|mmrp|gvrp|mvrp) peer
```

Parameters

dot1x	IEEE 802.1x access control and authentication
gmrp	GARP Multicast Address Registration Protocol.
gvrp	GARP VLAN Registration Protocol.
lacp	Link Aggregation Control Protocol.
mvrp	Multiple VLAN Registration Protocol.
mmrp	Multiple Multicast Routing Protocol.
stp	Spanning-tree Protocol.
discard	Discard the specified protocol packets on the interface or service VLAN.
peer	Peer the specified protocol on the interface or service VLAN. This parameter cannot be used with the <code>gvrp</code> or <code>mvrp</code> parameters.
tunnel	Tunnel the specified protocol on the interface or service VLAN.
VLAN_ID	SVLAN ID to be tunneled <1-4094>. Only specify this for <code>dot1x</code> and <code>lacp</code> .
cos-id	Class of service
<1-255>	Class of service identifier

Default

The default action for a Service VLAN is to tunnel.

Command Mode

Interface mode

Examples

```
(config)#interface eth1
(config-if)#l2protocol stp peer
(config-if)#l2protocol dot1x tunnel 1
```

show ethernet uni bundling

Use this command to show bundling and multiplexing settings.

Command Syntax

```
show ethernet uni bundling (uni-id UNI_NAME | interface IF_NAME | (bridge <1-32>|))
```

Parameters

uni-id	UNI ID on which the status needs to be displayed
UNI_NAME	Specify the UNI ID.
interface	Specify the interface.
IF_NAME	Specify the interface name.
bridge	Specify a bridge.
<1-32>	Specify a bridge ID.

Command Mode

Executive mode

Example

```
#show ethernet uni bundling bridge 1
```

```
Interface_nameUNI-IDBundlingAll-to-one-bundling Multiplexing
```

```
-----
eth1Customer1Yes NA NA
eth2 Customer2NAYes NA
```

show ethernet uni evc

Use this command to show the Ethernet virtual connector (EVC) identifications for an EVC or interface.

Command Syntax

```
show ethernet uni evc attributes (interface IF_NAME | evc-id EVC_ID (bridge <1-32>|))
```

Parameters

interface	Specify the interface.
IF_NAME	Specify the interface name.
evc-id	Display the EVC ID for the attributes needed to be displayed
EVC_ID	Specify the EVC ID.
bridge	Specify a bridge.
<1-32>	Specify a bridge ID.

Command Mode

Executive mode

Example

```
#show ethernet uni evc attributes evc-id new bridge 1
```

show ethernet uni evc-id

Use this command to show the Ethernet virtual connector (EVC) ID.

Command Syntax

```
show ethernet uni evc-id (uni-id UNI_NAME | interface IF_NAME | (bridge <1-32>|))
```

Parameters

uni-id	UNI ID on which the status needs to be displayed
UNI_NAME	Specify the UNI ID.
interface	Specify the interface.
IF_NAME	Specify the interface name.
bridge	Specify a bridge.
<1-32>	Specify a bridge ID.

Command Mode

Executive mode

Example

```
#show ethernet uni evc-id interface eth1
```

Interface-name	UNI-ID	UNI-EVC_ID
eth1	unia	unia,JCN_pro_vlan unia, HP_pro_vlan

```
#show ethernet uni max-evc bridge 1
```

Interface_name	UNI-ID	MAX-EVC
eth1	Customer1	4
eth2	Customer2	2

show ethernet uni list

Use this command to show the UNIs associated with an EVC or SVLAN.

Command Syntax

```
show ethernet uni list (svlan SVLAN_ID | evc EVC_ID |) (bridge <1-32>|)
```

Parameters

svlan	Display the SVLAN for which the UNI list need to be displayed
SVLAN_ID	Specify the SVLAN ID.
evc	Display the EVC for which the UNI list need to be displayed
EVC_ID	Specify the EVC ID.
bridge	Specify a bridge.
<1-32>	Specify a bridge ID.

Command Mode

Executive mode

Example

```
#show ethernet uni list svlan SVLAN_ID bridge 1
```

show ethernet uni max-evc

Use this command to show the maximum EVC of the UNI.

Command Syntax

```
show ethernet uni max-evc (uni-id UNI_NAME | interface INTERFACE_NAME |  
    ( bridge <1-32>|))
```

Parameters

uni-id	UNI ID on which the status needs to be displayed
UNI_NAME	Specify the UNI ID.
interface	Specify the interface.
INTERFACE_NAME	Specify the interface name.
bridge	Specify a bridge.
<1-32>	Specify a bridge ID.

Command Mode

Executive mode

Example

```
#show ethernet uni max-evc uni-id eth1
```

show ethernet uni type

Use this command to show the UNI-type and operational status of each protocol.

Command Syntax

```
show ethernet uni type (interface IF_NAME | (bridge <1-32>|))
```

Parameters

interface	Specify the interface.
IF_NAME	Specify the interface name.
bridge	Specify a bridge.
<1-32>	Specify a bridge ID.

Command Mode

Exec mode

Example

```
#show ethernet uni type interface eth1

Interface Name      : eth1
-----

UNI Type            : UNI Type 2
UNI Type 2 mode     : UNI Type 2.2
UNI TYPE Mode       : enable
CFM Operational Status : Not Operational
E-LMI Operational Status : Operational
```


CHAPTER 7 MEF-ENNI Commands

This chapter contains the commands used for the Metro Ethernet Forum External Network Network Interface (MEF-ENNI).

Note: MEF-ENNI is not supported for ZebIC releases.

- [\(cvlan | svlan\) VLAN_ID oep-id](#)
- [ethernet mapping table](#)
- [oep mapping table](#)
- [preserve-vlanid ovc-id](#)
- [svlan \(preserve-cos | preserve-vlanid\)](#)
- [show ethernet enni evc](#)

(cvlan | svlan) VLAN_ID oep-id

Use this command to create the entries in the oep-mapping table.

Command Syntax

```
(cvlan | svlan) VLAN_ID oep-id OEP_ID
no (cvlan | svlan) VLAN_ID
no oep-id OEP_ID
```

Parameters

VLAN_ID	Specify the VLAN_ID
ovc-id	Specify the OVC ID for the SVLAN

Command Mode

OEP_MAP_MODE

Example

```
#configure terminal
(config)#interface eth1
```

ethernet mapping table

Use this command to apply oep-mapping table on the specified interface.

Use the no command to delete oep-mapping table from the specified interface.

Command Syntax

```
ethernet (uni-oep | enni-oep) mapping table WORD
no ethernet (uni-oep | enni-oep) mapping table
```

Parameters

WORD	Specify OEP mapping table name
------	--------------------------------

Command Mode

Interface mode

Example

```
(config)#vlan database
(config-vlan)#vlan 2 type service multipoint-multipoint bridge 1 state enable
(config-vlan)#vlan 3 type service multipoint-multipoint bridge 1 state enable
(config-vlan)#vlan 4 type service multipoint-multipoint bridge 1 state enable
(config-vlan)#vlan 5 type service multipoint-multipoint bridge 1 state enable
(config-vlan)#vlan 6 type service multipoint-multipoint bridge 1 state enable
(config-vlan)#ethernet svlan 6 ovc-id ovcl oep-id oep1 bridge 1
(config-vlan)#ex
(config)#ethernet mapping table
```

oep mapping table

Use this command to create the oep-mapping table. The CLI will change the mode to OEP_MAP_MODE.

Use the no command to delete the oep-mapping table

Command Syntax

```
oep mapping table WORD (bridge <1-32>|)
no oep mapping table WORD (bridge <1-32>|)
```

Parameters

WORD	Specify the OEP mapping table name
<1-32>	Bridge group for bridging

Command Mode

Configuration Mode

Example

```
(config)#vlan database
(config-vlan)#vlan 2 type service multipoint-multipoint bridge 1 state enable
(config-vlan)#vlan 3 type service multipoint-multipoint bridge 1 state enable
(config-vlan)#vlan 4 type service multipoint-multipoint bridge 1 state enable
(config-vlan)#vlan 5 type service multipoint-multipoint bridge 1 state enable
(config-vlan)#vlan 6 type service multipoint-multipoint bridge 1 state enable
(config-vlan)#ethernet svlan 6 ovc-id ovcl oep-id oepl bridge 1
(config-vlan)#ex
(config)#oep mapping table
```

preserve-vlanid ovc-id

Use this command to sets the VLAN ID preservation for OVC ID

Use the `no` for of this command to removes the VLAN ID preservation for OVC ID.

Command Syntax

```
(ce-vlan | svlan) preserve-vlanid ovc-id OVC_ID  
no(ce-vlan | svlan) preserve-vlanid ovc-id OVC_ID
```

Parameters

<code>svlan</code>	Specify the Service VLAN ID
<code>ovc-id</code>	Specify the OVC ID for the SVLAN

Command Mode

Configure mode

Examples

```
#configure terminal  
(config)#svlan preserve-vlanid ovc-id 3  
  
#configure terminal  
(config)#no svlan preserve-vlanid ovc-id 3
```

svlan (preserve-cos | preserve-vlanid)

Use this command to sets the VLAN ID preservation for OVC ID

Use the `no` for of this command to removes the VLAN ID preservation for OVC ID.

Command Syntax

```
svlan (preserve-cos | preserve-vlanid) ovc-id OVC_ID (bridge <1-32> |)
no svlan (preserve-cos | preserve-vlanid) ovc-id OVC_ID (bridge <1-32> |)
```

Parameters

<code>svlan</code>	Specify the Service VLAN ID
<code>ovc-id</code>	Specify the OVC ID for the SVLAN

Command Mode

Configure mode

Examples

```
#configure terminal
(config)#svlan preserve-ovc-id 3

#configure terminal
(config)#no svlan preserve-ovc-id 3
```

show ethernet enni evc

Use this command to show the Operational virtual connector (OVC) identification for an OVC or interface.

Command Syntax

```
show ethernet enni ovc attributes (interface IF_NAME | ovc-id OVC_ID (bridge <1-32>|))
```

Parameters

interface	Specify the interface.
IF_NAME	Specify the interface name.
evc-id	Display the EVC ID for the attributes needed to be displayed
EVC_ID	Specify the EVC ID.
bridge	Specify a bridge.
<1-32>	Specify a bridge ID.

Command Mode

Executive mode

Example

```
#show ethernet uni evc attributes ovc-id new bridge 1
```


CHAPTER 8 Provider Bridging Commands

This chapter describes the Provider Bridging (PB) commands.

IEEE 802.1ad standardizes the architecture and bridged protocols to allow Ethernet frames with multiple VLAN tags. Packets through the provider network are doubly tagged with both an:

- Inner (C-VLAN) tag which is the customer network VLAN identifier
- Outer (S-VLAN) tag which is the service provider network VLAN identifier
 - [bridge protocol provider-mstp](#)
 - [bridge protocol provider-rstp](#)
 - [cvlan registration table](#)
 - [cvlan svlan](#)
 - [switchport](#)
 - [switchport customer-edge](#)
 - [switchport customer-edge default-svlan](#)
 - [switchport customer-edge hybrid](#)
 - [switchport customer-edge trunk](#)
 - [switchport customer-edge vlan registration](#)
 - [switchport customer-edge vlan translation](#)
 - [switchport customer-network vlan](#)
 - [switchport customer-network vlan translation](#)
 - [switchport mode](#)
 - [switchport mode ingress-filter](#)
 - [switchport mode customer-edge](#)
 - [switchport mode customer-edge hybrid acceptable-frame-type](#)
 - [switchport provider-edge](#)
 - [switchport provider-network vlan translation](#)
 - [switchport trunk native](#)
 - [vlan bridge allowed](#)
 - [vlan bridge name state](#)
 - [vlan bridge state](#)
 - [vlan mtu](#)
 - [vlan state](#)
 - [vlan type backbone](#)
 - [vlan type customer](#)
 - [vlan type service](#)

bridge protocol provider-mstp

Use this command to create a provider multiple spanning-tree protocol (MSTP) bridge. 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 features, while providing load-balancing capability. Using this command creates an instance of the spanning tree, and associates the VLANs specified with that instance. A bridge created by this command forms its own separate region.

Command Syntax

```
bridge <1-32> protocol provider-mstp (edge|)
```

Parameters

bridge	The bridge.
<1-32>	Bridge ID.
edge	Configure as edge bridge.

Command Mode

Configure mode

Example

```
#configure terminal
(config)#bridge 2 protocol provider-mstp edge
```

bridge protocol provider-rstp

Use this command to add an IEEE 802.1D-2004 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.

Command Syntax

```
bridge <1-32> protocol provider-rstp (edge|)
```

Parameters

bridge	The bridge.
<1-32>	Bridge ID.
edge	Configure as edge bridge.

Command Mode

Configure mode

Example

```
#configure terminal
(config)#bridge 2 protocol provider-rstp edge
(config)#no bridge 2
```

cvlan registration table

Use this command to create a customer VLAN (CVLAN) registration table that will have the mapping between CVLANs and service provider VLANs (SVLANs).

Use the `no` parameter with this command to delete the CVLAN registration table.

Command Syntax

```
cvlan registration table WORD
cvlan registration table WORD bridge <1-32>
no cvlan registration table WORD
```

Note: The above command is not supported for ZebIC releases.

```
no cvlan registration table WORD bridge <1-32>
```

Parameters

WORD	Name of the CVLAN registration table.
bridge	Specify a bridge.
<1-32>	Specify a bridge ID.

Command Mode

Configure mode

Example

```
#configure terminal
(config)#cvlan registration table customer1
(config-cvlan-registration)#
```

cvlan svlan

Use this command to create a mapping between the CVLAN and SVLAN.

Use the `no` forms of this command to delete the mapping.

Command Syntax

```
cvlan VLAN_ID svlan VLAN_ID
no cvlan VLAN_ID
no svlan VLAN_ID
```

Parameters

<code>cvlan</code>	Specify a CVLAN.
<code>VLAN_ID</code>	Specify a CVLAN ID <1-4094>.
<code>svlan</code>	Specify a SVLAN ID.
<code>VLAN_ID</code>	Specify a SVLAN ID <1-4094>.

Command Mode

Configure mode

Example

```
#configure terminal
(config)#cvlan registration table customer1
(config-cvlan-registration)#cvlan 2 svlan 3
(config-cvlan-registration)#cvlan 3 svlan 3
```

switchport

Use this command to set the switching characteristics of a Layer 2 interface.

Command Syntax

```
switchport (access|beb|hybrid|l2gp|private-vlan|trunk|provider-network|customer-
network|vlan-stacking) allowed vlan add VLAN_ID
switchport (access|beb|hybrid|l2gp|private-vlan|trunk|provider-network|customer-
network|vlan-stacking) allowed vlan all
switchport (access|beb|hybrid|l2gp|private-vlan|trunk|provider-network|customer-
network|vlan-stacking) allowed vlan none
switchport (access|beb|hybrid|l2gp|private-vlan|trunk|provider-network|customer-
network|vlan-stacking) allowed vlan remove VLAN_ID
switchport (access|beb|hybrid|l2gp|private-vlan|trunk|provider-network|customer-
network|vlan-stacking) allowed vlan except VLAN_ID
```

Parameters

access	Set the layer 2 interface as access.
beb	Identifies the layer 2 interface as one of the backbone port.
hybrid	Set the layer 2 interface as hybrid.
l2gp	l2gp.
private-vlan	Private-vlan.
trunk	Set the layer 2 interface as trunk.
provider-network	Set the layer 2 interface as provider.
customer-network	Set the layer 2 interface as customer.
vlan-stacking	Enable vlan-stacking.
add	Add a VLAN to the member set.
VLAN_ID	The ID of the VLAN <2-4094>.
all	Allow all VLANs to transmit and receive through the layer 2 interface.
except	All VLANs, except the VLAN ID specified, are part of its ports' member set.
VLAN_ID	The ID of the VLAN <2-4094>.
none	Allow no VLANs to transmit and receive through the layer 2 interface.
remove	Remove a VLAN from the member set.
VLAN_ID	The ID of the VLAN <2-4094>.

Default

The default action is to tunnel.

Command Mode

Interface mode

Example

```
#configure terminal
(config)#interface eth0
(config-if)#switchport provider-network allowed vlan add 2
```

switchport customer-edge

Use this command to set the switching characteristics of the layer 2 interface and the default customer VLAN.

Use the `no` form of this command to remove a customer VLAN.

Command Syntax

```
switchport customer-edge (access|hybrid) vlan <2-4094>
no switchport customer-edge (access|hybrid) vlan
```

Parameters

<code>access</code>	Set the layer 2 interface as access.
<code>hybrid</code>	Set the layer 2 interface as hybrid.
<code>vlan</code>	Set the default VID for the interface.
<code><2-4094></code>	Set the default VID for the interface.

Command Mode

Interface mode

Examples

```
#configure terminal
(config)#interface eth0
(config-if)#switchport customer-edge access vlan 3

(config)#interface eth0
(config-if)#no switchport customer-edge access vlan
```

switchport customer-edge default-svlan

Use this command to set the switching characteristics of the layer 2 interface and the default service VLAN.

Use the `no` form of this command to remove the default service VLAN.

Command Syntax

```
switchport customer-edge (hybrid|trunk) default-svlan DEFAULT_SVLAN
no switchport customer-edge (hybrid|trunk) default-svlan
```

Parameters

<code>hybrid</code>	Set the layer 2 interface as hybrid.
<code>trunk</code>	Set the layer 2 interface as trunk.
<code>default-svlan</code>	Set the default service VLAN.
<code>DEFAULT_SVLAN</code>	Set the default service VLAN identifier <2-4094>.

Command Mode

Interface mode

Examples

```
#configure terminal
(config)#interface eth0
(config-if)#switchport customer-edge hybrid default-svlan 3

(config)#interface eth0
(config-if)#no switchport customer-edge hybrid default-svlan
```

switchport customer-edge hybrid

Use this command to set the switching characteristics of the Layer 2 customer-facing interface to hybrid. Both tagged and untagged frames will be classified over hybrid interfaces.

Command Syntax

```
switchport customer-edge hybrid allowed vlan add VLAN_ID
    egress-tagged (enable|disable)

switchport customer-edge hybrid allowed vlan remove VLAN_ID

switchport customer-edge hybrid allowed vlan all

switchport customer-edge hybrid allowed vlan none
```

Parameters

add	Add a VLAN to the member set.
VLAN_ID	ID of the VLAN <2-4094>.
egress-tagged	Set the egress tagging for the outgoing frames.
enable	Enable egress tagging for outgoing frames.
disable	Disable egress tagging for outgoing frames.
remove	Remove a VLAN from the member set.
VLAN_ID	ID of the VLAN <2-4094>.
all	Allow all VLANs to transmit and receive through the Layer 2 interface.
none	Allow no VLANs to transmit and receive through the Layer 2 interface.

Command Mode

Interface mode

Examples

```
(config)#interface eth0
(config-if)#switchport customer-edge hybrid allowed vlan add 2 egress-tagged
enable
```

switchport customer-edge trunk

Use this command to set the Layer2 interface as trunk.

Command Syntax

```
switchport customer-edge trunk allowed vlan add VLAN_ID
switchport customer-edge trunk allowed vlan remove VLAN_ID
switchport customer-edge trunk allowed vlan all
switchport customer-edge trunk allowed vlan none
```

Parameters

add	Add a VLAN to the member set.
VLAN_ID	Specify a VLAN ID.
remove	Remove a VLAN from the member set.
VLAN_ID	Specify a VLAN ID.
all	Allow all VLANs to transmit and receive through the Layer 2 interface.
none	Allow no VLANs to transmit and receive through the Layer 2 interface.

Command Mode

Interface mode

Examples

```
#configure terminal
(config)#interface eth1
(config-if)#switchport customer-edge trunk allowed vlan add 12
```

switchport customer-edge vlan registration

Use this command to configure the VLAN registration parameters.

Use the `no` parameter with this command to delete the mapping from the interface.

Command Syntax

```
switchport customer-edge vlan registration WORD
no switchport customer-edge vlan registration
```

Parameters

WORD	Name of the CVLAN registration table.
------	---------------------------------------

Command Mode

Interface mode

Example

```
#configure terminal
(config)#interface eth1
(config-if)#switchport customer-edge vlan registration customer1
```

switchport customer-edge vlan translation

Use this command to configure a VLAN translation table for the interface.

Use the `no` parameter with this command to delete the mapping from the interface.

Command Syntax

```
switchport customer-edge vlan translation vlan VLAN_ID vlan VLAN_ID
no switchport customer-edge vlan translation vlan VLAN_ID
```

Parameters

<code>vlan</code>	Indicates C-VLAN is to be translated
<code>VLAN_ID</code>	Specify the C-VLAN ID of tag to be translated
<code>vlan</code>	Indicate the translated C-VLAN
<code>VLAN_ID</code>	Specify the translated C-VLAN ID.

Command Mode

Interface mode

Examples

```
#configure terminal
(config)#interface eth1
(config-if)#switchport customer-edge vlan translation vlan 12 vlan 12

(config-if)#no switchport customer-edge vlan translation vlan 12
```

switchport customer-network vlan

Use this command to set the Layer2 interface as a Customer Network which behaves as specified by the 802.1 AD standard.

Command Syntax

```
switchport customer-network vlan <2-4094>
no switchport customer-network vlan
```

Parameters

<2-4094> Set the default VLAN ID for the interface.

Default

The default action is to tunnel.

Command Mode

Interface mode

Examples

```
#configure terminal
(config)#interface eth0
(config-if)#switchport customer-network vlan 2
```

switchport customer-network vlan translation

Use this command to add a translation table entry for SVLANs on a customer network port.

Use the `no` option with this command to delete a translation table entry for SVLANs on a customer network port.

Command Syntax

```
switchport customer-network vlan translation svlan VLAN_ID svlan VLAN_ID
no switchport customer-network vlan translation svlan VLAN_ID
```

Parameters

svlan	SVLAN to be translated.
VLAN_ID	ID of the SVLAN to be translated <2-4094>.
svlan	The translated SVLAN.
VLAN_ID	ID of the translated SVLAN <2-4094>.

Command Mode

Interface mode

Example

```
#configure terminal
(config)#interface eth1
(config-if)#switchport customer-network vlan 20
(config-if)#switchport customer-network vlan translation svlan 10 svlan 20
```

switchport mode

Use this command to set the switching characteristics of the Layer 2 interface.

Command Syntax

```
switchport mode (access|hybrid|trunk|provider-network|customer-network)
```

Parameters

access	Access.
hybrid	Hybrid.
trunk	Trunk.
provider-network	Provider network.
customer-network	Customer network.

Command Mode

Interface mode

Example

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

switchport mode ingress-filter

Use this command to 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 (access|hybrid|trunk|provider-network|customer-network)
  ingress-filter (enable|disable)
```

Parameters

access	Access.
hybrid	Hybrid.
trunk	Trunk.
provider-network	Provider network.
customer-network	Customer network.
ingress-filter	Set the ingress filtering for the received frames.
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.
disable	Turn off ingress filtering to accept frames that do not meet the classification criteria. This is the default value.

Default

The result of not using this command is that ingress filtering is off, and that all frame types are classified and accepted. Using this command without the `ingress-filter` parameter causes this command to use the default values.

Command Mode

Interface mode

Example

```
#configure terminal
(config)#interface eth0
(config-if)#switchport mode provider-network ingress-filter enable
```

switchport mode customer-edge

Use this command to set the switching characteristics of the Layer 2 customer facing interface and classify only 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 customer-edge (access|hybrid|trunk)
switchport mode customer-edge (access|hybrid|trunk) ingress-filter (enable|disable)
```

Parameters

access	Set the layer 2 interface as access.
hybrid	Set the layer 2 interface as hybrid.
trunk	Set the layer 2 interface as trunk.
ingress-filter	Set the ingress filtering for the received frames.
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.
disable	Turn off ingress filtering to accept frames that do not meet the classification criteria. This is the default value.

Default

The result of not using this command is that ingress filtering is off, and that all frame types are classified and accepted. Using this command without the `ingress-filter` parameter causes this command to use the default values.

Command Mode

Interface mode

Example

```
#configure terminal
(config)#interface eth0
(config-if)#switchport mode customer-edge access ingress-filter enable
```

switchport mode customer-edge hybrid acceptable-frame-type

Use this command to set the layer 2 interface acceptable frames types. This processing occurs after VLAN classification.

Command Syntax

```
switchport mode customer-edge hybrid acceptable-frame-type (all|vlan-tagged)
```

Parameters

all	Set all frames can be received.
vlan-tagged	Set only VLAN-tagged frames can be received.

Command Mode

Interface mode

Example

```
#configure terminal
(config)#interface eth0
(config-if)#switchport mode customer-edge hybrid acceptable-frame-type vlan-
tagged
```

switchport provider-edge

Use this command to set the switching characteristics of the Layer 2 logical provider edge port. By default, egress tagging is enabled for all VLANs on the provider edge ports.

Command Syntax

```
switchport provider-edge vlan VLANID untagged-vlan VLANID
switchport provider-edge vlan VLANID default-vlan VLANID
```

Parameters

vlan	VLAN ID Of the provider edge port <2-4094>.
untagged-vlan	VLAN ID that will be untagged on the provider side <2-4094>.
default-vlan	VLAN ID to which untagged packets will be classified <2-4094>.

Command Mode

Interface mode

Example

```
#configure terminal
(config)#interface eth0
(config-if)#switchport provider-edge vlan 122 default-vlan 12
```

switchport provider-network vlan translation

Use this command to add a translation table entry for CVLANs on a provider network port.

Use the `no` form of this command to delete a translation table entry for CVLANs on a provider network port.

Command Syntax

```
switchport provider-network vlan translation svlan VLAN_ID svlan VLAN_ID
no switchport provider-network vlan translation svlan VLAN_ID
```

Parameters

svlan	SVLAN to be translated.
VLAN_ID	ID of the SVLAN to be translated <2-4094>.
svlan	ID of the translated SVLAN.
VLAN_ID	ID of the translated SVLAN <2-4094>.

Command Mode

Interface mode

Example

```
#configure terminal
(config)#interface eth1
(config-if)#switchport provider-network vlan translation svlan 10 svlan 20
```

switchport trunk native

Use this command to set the native VLAN for classifying untagged traffic through the layer 2 interface.

Use the no form of this command to reset the native VLAN to the default VLAN.

Command Syntax

```
switchport trunk native vlan VLAN_ID
no switchport trunk native vlan
```

Parameters

VLAN_ID ID of the VLAN <2-4094>.

Command Mode

Interface mode

Example

```
#configure terminal
(config)#interface eth0
(config-if)#switchport trunk native vlan 2
...
(config)#interface eth0
(config-if)#no switchport trunk native vlan
```

vlan bridge allowed

This command adds or removes a VLAN on a bridge.

Command Syntax

```
vlan <2-4094> bridge (<1-32>|backbone) (allowed|forbidden) (multicast|)
      (add|remove) interface IFNAME
```

Parameters.

vlan	Specify the VLAN.
VLAN_ID	Specify the VLAN ID <2-4094>.
bridge	Bridge.
<1-32>	Bridge ID.
backbone	Specifies the backbone.
allowed	Allowed list.
forbidden	Forbidden list.
multicast	Specifies the entry as multicast.
add	Adds an interface in the VLAN list.
remove	Deletes an interface from the VLAN list.
interface	Specify the interface.
IF_NAME	Specify the interface name.

Command Mode

VLAN Configuration mode

Example

```
#configure terminal
(config)#vlan database
(config-vlan)#vlan 12 bridge 1 allowed multicast add interface eth1

#configure terminal
(config)#vlan database
(config-vlan)#vlan 12 bridge 1 forbidden multicast add interface eth1
```

vlan bridge name state

Use this command to add a VLAN.

Command Syntax

```
vlan <2-4094> bridge <1-32> name WORD (state (enable|disable) |)
```

Parameters

vlan	The VLAN.
<2-4094>	The VLAN ID
bridge	The bridge
<1-32>	The bridge ID
name	The VLAN name
WORD	The name of the VLAN
state	Operational state of the VLAN; if not specified, the default is to enable the VLAN
enable	Set the VLAN to enabled
disable	Set the VLAN to disabled

Command Mode

VLAN Configuration mode

Examples

```
#configure terminal
(config)#vlan database
(config-vlan)#vlan 12 bridge 1 name newword state disable
```

vlan bridge state

Use this command to add a VLAN.

Command Syntax

```
vlan <2-4094> bridge <1-32> state (enable|disable)
```

Parameters

vlan	The VLAN.
<2-4094>	The VLAN ID
bridge	The bridge
<1-32>	The bridge ID
state	Operational state of the VLAN
enable	Set the VLAN to enabled
disable	Set the VLAN to disabled

Command Mode

VLAN Configuration mode

Examples

```
#configure terminal
(config)#vlan database
(config-vlan)#vlan 12 bridge 1 state disable
```

vlan mtu

Use this command to set the maximum transmission unit (MTU) for the VLAN. Any packet with a size greater than the configured size is discarded

Use the `no` form of this command to reset the MTU.

Note: This command is not supported for ZebIC releases.

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

vlan	The VLAN.
<2-4094>	VLAN ID.
mtu	Maximum transmission unit.
MTU_VAL	Maximum transmission unit value.
bridge	The bridge.
<1-32>	Bridge ID.

Command Mode

VLAN Configuration mode

Examples

```
#configure terminal
(config)#vlan database
(config-vlan)#vlan 12 mtu bridge 1
```

vlan state

Use this command enables or disables a VLAN on the default bridge.

Note: Provider Backbone Bridging is not supported for ZebIC releases.

Command Syntax

```
vlan <2-4094> state (enable|disable)
```

Parameters

vlan	The VLAN
<2-4094>	The VLAN ID
state	Operational state of the VLAN
enable	Forward frames on the bridge
disable	Do not forward frames on the bridge

Command Mode

VLAN configuration mode

Examples

```
#configure terminal
(config)#vlan database
(config-vlan)#vlan 12 state disable
```

vlan type backbone

Use this command to identify a VLAN as a backbone VLAN and to specify point-to-point, multipoint-to-multipoint, or rooted-multipoint service type.

Use the `no` form of this command to remove the VLAN from the BEB B-component.

Command Syntax

```
vlan <2-4094> type backbone ((point-point | multipoint-multipoint | rooted-  
multipoint) (name WORD|)) (state (enable | disable)|)  
no vlan <2-4094> type backbone
```

Parameters

<code>point-point</code>	Sets the backbone VLAN service type to point-to-point (MEF E-Line)
<code>multipoint-multipoint</code>	Sets the backbone VLAN service type to multipoint-multipoint (MEF E-LAN)
<code>rooted-multipoint</code>	An extension of the multipoint-to-multipoint service type, where the type of each UNI in the EVC can be set to <code>root</code> or <code>leaf</code> with the ethernet uni id command. If <code>root</code> , the UNI can send service frames to all other points in the EVC; if <code>leaf</code> , the UNI can send and receive service frames to and from <code>root</code> only (MEF E-Tree)
<code>name</code>	The ASCII name of the VLAN. The maximum length is 16 characters.
<code>state</code>	Indicates the state of the VLAN
<code>enable</code>	Forward frames over the selected VLAN-aware bridge.
<code>disable</code>	Do not forward frames over the selected VLAN-aware bridge.

Command Mode

VLAN Configuration mode

Examples

```
#configure terminal  
(config)#vlan database  
(config-vlan)#vlan 45 type backbone point-point name vlan45 state enable
```

vlan type customer

Use this command to identify a VLAN as a customer VLAN (CVLAN).

Command Syntax

```
vlan <2-4094> type customer
vlan <2-4094> type customer state (enable|disable)
vlan <2-4094> type customer name WORD (state (enable|disable)|)
```

Note: The above commands are not supported for ZebIC releases.

```
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)|)
no vlan <2-4094> type customer
```

Note: The above command is not supported for ZebIC releases.

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

Parameters

vlan	The VLAN
<2-4094>	VLAN ID
name	The VLAN
WORD	The name of the VLAN
bridge	The bridge
<1-32>	VLAN ID
state	Indicates the state of the VLAN
enable	Forward frames over the selected VLAN-aware bridge.
disable	Do not forward frames over the selected VLAN-aware bridge.

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

Use this command to identify a VLAN as a service VLAN (SVLAN) and to specify point-to-point, multipoint-to-multipoint, or rooted-multipoint service type.

Command Syntax

```
vlan <2-4094> type service (point-point|multipoint-multipoint|rooted-multipoint)
vlan <2-4094> type service (point-point|multipoint-multipoint|rooted-multipoint)
    state (enable|disable)
vlan <2-4094> type service (point-point|multipoint-multipoint|rooted-multipoint)
    name WORD (state (enable|disable) |)
```

Note: The above commands are not supported for ZebIC releases.

```
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> state (enable|disable)
vlan <2-4094> type service (point-point|multipoint-multipoint|rooted-multipoint)
    bridge <1-32> name WORD (state (enable|disable) |)
no vlan <2-4094> type service
```

Note: The above command is not supported for ZebIC releases.

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

Parameters

vlan	The VLAN
<2-4094>	VLAN ID
point-point	Sets the service VLAN service type to point-to-point (MEF E-Line)
multipoint-multipoint	Sets the service VLAN service type to multipoint-multipoint (MEF E-LAN)
rooted-multipoint	An extension of the multipoint-to-multipoint service type, where the type of each UNI in the EVC can be set to <code>root</code> or <code>leaf</code> with the ethernet uni id command. If <code>root</code> , the UNI can send service frames to all other points in the EVC; if <code>leaf</code> , the UNI can send and receive service frames to and from <code>root</code> only (MEF E-Tree)
state	Indicates the state of the VLAN
enable	Forward frames over the selected VLAN-aware bridge.
disable	Do not forward frames over the selected VLAN-aware bridge.
name	The VLAN
WORD	The name of the VLAN
bridge	The bridge
<1-32>	Bridge ID

Command Mode

VLAN configuration mode

Examples

```
#configure terminal
(config)#vlan database
(config-vlan)#vlan 12 type service multipoint-multipoint name new state enable
```


CHAPTER 9 Provider Backbone Bridging Commands

This chapter describes the Provider Backbone Bridging (PBB) commands. Provider Backbone Bridging enables a provider organization to build 802.1ah-compliant Ethernet backbone networks by interconnecting 802.1ad Provider Bridging aggregate networks.

Note: Provider Backbone Bridging is not supported for ZebIC releases.

- [bridge beb protocol](#)
- [bridge-group path-cost](#)
- [bridge-group priority](#)
- [bridge-group spanning-tree](#)
- [bridge-group vlan](#)
- [bridge-group vlan path-cost](#)
- [bridge-group vlan priority](#)
- [isis](#)
- [pbb isid list](#)
- [show beb bridge](#)
- [show debug beb](#)
- [show beb service](#)
- [switchport beb \(check|dispatch|remove\)](#)
- [switchport beb customer-backbone instance](#)
- [switchport beb customer-network port-based](#)
- [switchport beb customer-network svlan](#)
- [switchport beb pip](#)
- [switchport beb provider-network](#)
- [switchport beb vip](#)
- [switchport beb vlan](#)
- [switchport mode \(cnp|pip|cbp|pnp\)](#)

bridge beb protocol

Use this command to create a provider multiple spanning tree protocol (MSTP) bridge. A bridge is either a:

- A PBB I-component identified by a bridge ID <1-32>
- A B-component bridge that is identified by “backbone”

Multiple spanning tree (MST) bridges can have different spanning-tree topologies for different VLANs inside a region of similar MST bridges. The multiple spanning tree protocol, like the rapid spanning tree protocol, provides rapid reconfiguration capability while providing load balancing ability. Using this command creates an instance of the spanning tree and associates specific VLANs specified, with that instance. A bridge created by the above command would form its own separate region.

Command Syntax

```
bridge beb mac MAC <1-32> protocol provider-rstp
bridge beb mac MAC backbone protocol provider-rstp
bridge beb mac MAC <1-32> protocol provider-mstp
bridge beb mac MAC backbone protocol provider-mstp
```

Parameters

mac	MAC address.
MAC	Specify a MAC address in HHHH.HHHH.HHHH format.
<1-32>	Specify the bridge ID.
backbone	Specify the bridge as backbone B-BEB.
protocol	Specify a spanning-tree protocol
provider-mstp	Provider IEEE 802.1s multiple spanning-tree protocol
provider-rstp	Provider IEEE 802.1w rapid spanning-tree protocol

Command Mode

Configure mode

Examples

```
#configure terminal
(config)#bridge beb mac 1234.5678.9012 backbone protocol provider-mstp
```

```
#configure terminal
(config)#bridge beb mac 1234.5678.9012 backbone protocol provider-rstp
```

bridge-group path-cost

Use this command set the path cost for an interface.

Use the `no` form of this command to remove the path cost for an interface.

Command Syntax

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

Parameters

bridge-group	Specify the bridge group.
<1-32>	Specify the bridge group ID.
path-cost	Path cost for the interface.
<1-200000000>	

Set the path cost (lower path cost means greater likelihood of becoming root).

Command Mode

Interface mode

Examples

```
#configure terminal
(config)#interface eth0
(config-if)#bridge-group 1 path-cost 12

(config)#interface eth0
(config-if)#no bridge-group 1 path-cost
```

bridge-group priority

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

Command Syntax

```
bridge-group <1-32> priority <0-240>
```

Parameters

bridge-group	Specify the bridge group.
<1-32>	Specify the bridge group ID.
priority	Port priority for a bridge.
<0-240>	Set the port priority in increments of 16 (lower priority means greater likelihood of becoming root).

Command Mode

Interface mode

Example

```
#configure terminal
(config)#interface eth0
(config-if)#bridge-group 1 instance 1 priority 16
```

bridge-group spanning-tree

Use this command to enable or disable spanning tree for an interface.

Command Syntax

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

Parameters

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

Command Mode

Interface mode

Examples

```
#configure terminal
(config)#interface eth0
(config-if)#bridge-group 1 spanning-tree enable

(config)#interface eth0
(config-if)#bridge-group 1 spanning-tree disable
```

bridge-group vlan

Use this command to set an interface as a rapid per-VLAN spanning tree instance.

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

Command Syntax

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

Parameters

<code>bridge-group</code>	Specify the bridge group.
<code><1-32></code>	Specify the bridge group ID.
<code>vlan</code>	Specify the VLAN.
<code><2-4094></code>	Set the VLAN identifier

Command Mode

Interface mode

Examples

```
#configure terminal
(config)#interface eth0
(config-if)#bridge-group 1 vlan 55

(config)#interface eth0
(config-if)#no bridge-group 1 vlan 55
```

bridge-group vlan path-cost

Use this command to set the path cost for a rapid per-VLAN spanning tree instance.

Use the `no` form of this command to remove the path cost.

Command Syntax

```
bridge-group <1-32> vlan <2-4094> path-cost <1-2000000000>
no bridge-group <1-32> vlan <2-4094> path-cost
```

Parameters

bridge-group	Specify the bridge group.
<1-32>	Specify the bridge group ID.
vlan	Specify the VLAN.
<2-4094>	Set the VLAN identifier
path-cost	Path cost for a port.
<1-2000000000>	Set the path cost (lower path cost means greater likelihood of becoming root).

Command Mode

Interface mode

Examples

```
#configure terminal
(config)#interface eth0
(config-if)#bridge-group 1 vlan 55 path-cost 5

(config)#interface eth0
(config-if)#no bridge-group 1 vlan 55 path-cost
```

bridge-group vlan priority

Use this command to set an interface as a rapid per-VLAN spanning tree instance.

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

Command Syntax

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

Parameters

<code>bridge-group</code>	Specify the bridge group.
<code><1-32></code>	Specify the bridge group ID.
<code>vlan</code>	Specify the VLAN.
<code><2-4094></code>	Set the VLAN identifier
<code>priority</code>	Port priority for a bridge.
<code><0-240></code>	Set the port priority in increments of 16 (lower priority indicates greater likelihood of becoming root).

Command Mode

Interface mode

Examples

```
#configure terminal
(config)#interface eth0
(config-if)#bridge-group 1 vlan 55 priority 4

(config)#interface eth0
(config-if)#no bridge-group 1 vlan 55 priority
```

isid

Use this command to create one or more I-SID (Ethernet Service Instance Identifier) entries on an I-component.

Use the no form of this command to remove one or more I-SID entries.

Command Syntax

```
isid <1-16777214> (to <1-16777214> | ) name ISID_NAME i-component <1-32>
no (isid <1-16777214> (to <1-16777214> | ) | instance-name ISID_NAME ) i-component
<1-32>
```

Parameters

<1-16777214>	Starting Ethernet service instance identifier
to	Ending Ethernet service instance identifier
<1-16777214>	Ending Ethernet service instance identifier
name	Service instance name
ISID_NAME	Service instance name
i-component	Specify the I-component
<1-32>	I-component identifier
instance-name	Service instance name
ISID_NAME	Service instance name

Command Mode

ISID configuration mode

Examples

```
#configure terminal
(config)#pbb isid list
(pbb-isid)#isid 200 name c200 i-component 1
```

pbb isid list

Use this command to switch to I-SID (Ethernet Service Instance Identifier) configuration mode where you can add I-SIDs to an I-component.

Command Syntax

```
pbb isid list
```

Parameters

None

Command Mode

Configure mode

Examples

```
#configure terminal
(config)#pbb isid list
(pbb-isid)#
```

show beb bridge

Use this command to show information for a Backbone Edge Bridge (BEB).

Command Syntax

```
show beb bridge ((<1-32> ( cnp | vip | pip | vlan |)) |  
  (backbone (|cbp | pnp | vlan )))
```

Parameters

<1-32>	Indicates the I-comp bridge number.
cnp	Display customer-network-port information for this bridge.
pip	Display provider-instance-port information for this bridge.
vip	Display virtual-instance-port information for this bridge.
vlan	Display the VLAN-specific details for this bridge.
backbone	Show port related details for the I-comp bridge.
cbp	Display customer-backbone-port information for this bridge.
pnp	Display provider-network-port information for this bridge.
vlan	Display the VLAN-specific details for this bridge.

Command Mode

Exec mode and Privileged Exec mode

Examples

The following is an example of the console output from this command:

```
#show beb bridge 1  
Interface name      : eth2  
Switchport mode    : cnp  
Interface name      : eth3  
Switchport mode    : cnp  
#show beb bridge backbone  
Interface name      : eth1  
Switchport mode    : pnp
```

show debug beb

Use this command to display debugging information for a BEB node type.

Command Syntax

```
show debug beb (sno (1|2|3|4|5|6))
```

Parameters

sno	Specify the type of port.
1	Customer network port
2	Virtual instance port
3	Provider instance port
4	VIPxref
5	PIP2VIP
6	Customer backbone port

Command Mode

Exec mode and Privileged Exec mode

Example

```
#show debug beb sno 1
Printing All CNP Nodes
=====
sid icmpid port_num service_type srv_stat ref_port svlans
=====
```

show beb service

Use this command to display information related to a specific backbone service instance.

Command Syntax

```
show beb service (name WORD | <1-16777214> )
```

Parameters

name	The name of the service instance.
WORD	Specify the name of the service instance.
<1-16777214>	Specify the Ethernet service instance ID.

Command Mode

Exec mode and Privileged Exec mode

Example

```
#show beb service name customer1
```

switchport beb (check|dispatch|remove)

Use this command to check, dispatch, or remove service instances associated with an interface. This is an Interface mode command because same service instance ID could be configured at each port facing different customers.

After issuing this command on an I-Component, any customer network port (CNP) that has the same service instance ID configured is deployed at the same time. However, you must ensure that the S-VLAN configuration across all CNPs is consistent as intended.

Command Syntax

```
switchport beb (check | dispatch | remove) service(name WORD | <1-16777214>)
```

Parameters

check	Specify to check service instances associated with an interface.
dispatch	Specify to dispatch pre-configured service instances associated with an interface. The hardware configuration for the service instance is sent to the forwarding plane immediately.
remove	Specify to remove a service instance that is associated with an interface.
service	Specify the service name or ISID.
name	Indicates the name of the service instance.
WORD	The name of the virtual instance port
<1-16777214>	Specify the Ethernet service instance ID.

Command Mode

Interface mode

Example

```
#configure terminal
(config)#interface eth0
(config-if)#switchport beb check service name customer1

#configure terminal
(config)#interface eth0
(config-if)#switchport beb dispatch service name customer1

#configure terminal
(config)#interface eth0
(config-if)#switchport beb remove service name customer1
```

switchport beb customer-backbone instance

Use these commands to add or delete customer service instance to backbone VLAN mapping for a CBP (customer backbone port).

Note: NSM stores the configuration you specify in this command internally. However, the configuration is not dispatched to the forwarding plane hardware until you give the `switchport dispatch instance` command.

Command Syntax

```
switchport beb customer-backbone instance add <1-16777214> (to <1-16777214> | )
    bvlan <2-4094> (|mode (rx|tx|rxtx|none)) (| multipoint) (|default-da MAC)
    (|instance-map <1-16777214>) (|edge)

switchport beb customer-backbone instance (none | (delete <1-16777214> (to <1-
16777214> | )))
```

Parameters

add	Add one or more service instances.
<1-16777214>	Starting Ethernet service instance identifier (I-SID).
to	Ending I-SID
<1-16777214>	Ending I-SID
bvlan	The B-VLAN.
<2-4094>	The VID of the B-VLAN.
mode	Whether the service instance can transmit and receive:
rx	The service instance can receive only.
tx	The service instance can transmit only.
rxtx	The service instance can both transmit and receive.
none	The service instance can neither transmit nor receive.
multipoint	Indicates multipoint ingress/egress limit. If this parameter is not specified, the default is point-to-point.
default-da	The default destination MAC address for the ingress frame. If this parameter is not specified, the broadcast MAC address is used.
MAC	A backbone destination MAC address in the <code>HHHH.HHHH.HHHH</code> format
instance-map	Indicates a 1:1 ingress-to-PBBN instance map.
<1-16777214>	Instance map identifier.
edge	Indicates that this CBP acts as an I-tagged edge interface (E-NNI, or external node-to-node interface).
none	Allow no service instance on this CBP port.
delete	Delete one or more service-B-VLAN mappings.
<1-16777214>	

Starting Ethernet service instance identifier (I-SID).
to Ending I-SID
<1-16777214>
Ending I-SID

Command Mode

Interface mode

Examples

```
#configure terminal
(config)#interface eth0
(config-if)#switchport beb customer-backbone instance add 1 bvlan 2 mode rx
(config-if)#switchport beb customer-backbone instance delete 1
```

switchport beb customer-network port-based

Use this command to set the current interface to a port-based PBB (provider backbone bridge) service instance.

Use the `no` form of this command to reset the interface and remove it from a port-based PBB service instance.

Note: The configuration information for this command is kept in NSM internally. Dispatch to the forwarding plane hardware via the PAL only takes place when you give the `switchport dispatch instance` command.

Command Syntax

```
switchport beb customer-network port-based (instance <1-16777214>|name
  INSTANCE_NAME)
switchport beb customer-network port-based (instance <1-16777214>|name
  INSTANCE_NAME) egress-port IFNAME
no switchport beb customer-network port-based (instance <1-16777214>|name
  INSTANCE_NAME)
```

Parameters

<code>instance</code>	Service instance ID
<code><1-16777214></code>	
	Specify the Ethernet service instance ID
<code>name</code>	The service instance name.
<code>INSTANCE_NAME</code>	
	Specify the name of the service instance.
<code>egress-port</code>	The egress PIP (Provider Instance Port).
<code>IFNAME</code>	Specify the name of the physical Provider Instance Port for this service instance.

Command Mode

Interface mode

Examples

The following commands configure `eth0` as a port-based Customer Network Port (CNP). All traffic ingress on `eth0` will be sent through `eth1` using service instance (I-SD) 1:

```
#configure terminal
(config)#interface eth0
(config-if)#switchport beb customer-network port-based instance 1
```

The following commands reset `eth0` and delete the port-based service instance associated with `eth0`:

```
#configure terminal
(config)#interface eth0
(config-if)#no switchport beb customer-network port-based instance 1
```

switchport beb customer-network svlan

These commands set the switching characteristics of a Layer 2 customer-facing interface to an SVLAN-aware interface.

BEB identifies the interface as a BEB (Backbone Edge Bridge). Single, bundled, and all S-VLAN modes are supported by these commands. The port being configured is a customer-network port, so the VLAN ID must be a service VLAN (I-SID).

Use the `no` form of this command to delete an S-VLAN to service instance mapping on this interface.

Note: The configuration information for this command is kept in NSM internally. Dispatch to forwarding plane hardware via PAL only takes place when you give the `switchport dispatch instance` command.

Command Syntax

```
switchport beb customer-network svlan all (instance <1-16777214>| name
  INSTANCE_NAME)
switchport beb customer-network svlan all (instance <1-16777214>| name
  INSTANCE_NAME) egress-port IFNAME
switchport beb customer-network svlan add (range <2-4094> <2-4094> | <2-4094>)
  (instance <1-1677214> |name INSTANCE_NAME)
switchport beb customer-network svlan add (range <2-4094> <2-4094> | <2-4094>)
  (instance <1-16777214>| name INSTANCE_NAME) egress-port IFNAME
switchport beb customer-network svlan remove (range <2-4094> <2-4094> | <2-4094>)
  (instance <1-1677214>| name INSTANCE_NAME)
no switchport beb customer-network svlan (instance <1-16777214>|name INSTANCE_NAME)
```

Parameters

<code>all</code>	Allow all VLANs to transmit and receive through the Layer 2 Interface
<code>add</code>	Add a specific VLAN to the member set or a range of VLANs.
<code>remove</code>	Remove a specific VLAN from the member set or a range of VLANs.
<code>instance</code> <code><1-16777214></code>	Service instance ID. The service instance ID.
<code>name</code> <code>INSTANCE_NAME</code>	The service instance name. The service instance name.
<code>egress-port</code> <code>IFNAME</code>	The egress PIP (Provider Instance Port). Specify the name of the physical Provider Instance Port for this service instance.
<code>range</code> <code><2-4094> <2-4094></code>	Specify a range of VLAN IDs in a contiguous block. The beginning and end of a range of VLAN IDs.
<code><2-4094></code>	A specific VLAN ID.

Command Mode

Interface mode

Examples

```
#configure terminal
(config)#interface eth0
(config-if)#switchport beb customer-network svlan add 2 instance 1
(config-if)#switchport beb customer-network svlan all instance 1
(config-if)#switchport beb customer-network svlan remove 2 instance 1
(config-if)#no switchport beb customer-network svlan instance 1
```

switchport beb pip

Use this command to configure a default backbone source MAC address for a PIP interface.

Command Syntax

```
switchport beb pip backbone-source-mac MAC
```

Parameters

`backbone-source-mac`

A MAC address.

`MAC`

Specify the MAC address in HHHH.HHHH.HHHH format.

Command Mode

Interface mode

Examples

```
#configure terminal
(config)#interface eth0
(config-if)#switchport beb pip backbone-source-mac 1111.1111.111
```

switchport beb provider-network

This command sets a layer 2 interface as provider network port (PNP) as per the 802.1ah standard.

Command Syntax

```
switchport beb provider-network bvlan (none | all | ((add | remove) <2-4094>))
```

Parameters

bvlan	Identifies the BVLANS.
none	Remove all VLAN associations from this PNP port.
all	Associate all VLANs to this PNP port.
add	Add a VLAN to this PNP port.
<2-4094>	The VID of the B-VLAN to be added.
remove	Remove a VLAN from this PNP port.
<2-4094>	The VID of the B-VLAN.

Command Mode

Interface mode

Examples

```
#configure terminal
(config)#interface eth0
(config-if)#switchport beb provider-network bvlan add 2
```

switchport beb vip

Use this command to set the VIP (Virtual Instance Port) of a service instance. The VIP port is internally created when a `switchport beb custom-instance` command was issued.

Please note that the configuration information related to this command is kept in NSM internally. Dispatch to forwarding plane hardware via PAL only happens when the `switchport dispatch instance ISID` command is issued.

Command Syntax

```
switchport beb vip (name WORD | instance <1-16777214>) (default-da MAC | (allowed
    (ingress | egress | all)))
```

Parameters

name	Defines a name for the virtual instance port.
WORD	The name for the virtual instance port.
instance	The I-SID (service instance ID).
<1-16777214>	The service instance ID.
default-da	Configures a default destination MAC address for the ingress frame. If not specified, the broadcast MAC address is used.
MAC	Specify a MAC address HHHH.HHHH.HHHH format.
allowed	Configures the service flow direction.
all	Set the service flow direction to both ingress and egress.
egress	Set the service flow direction to egress only.
ingress	Set the service flow direction to ingress only.

Command Mode

Interface mode

Examples

```
#configure terminal
(config)#interface eth0
(config-if)#switchport beb vip name customer1 allowed ingress

(config)#interface eth0
(config-if)#switchport beb vip name new default-da 1111.1111.1111
```

switchport beb vlan

Use this command to configure VLAN ports for Provider Backbone Bridges (PBB). Use this command to set the default VLAN identifier (provider VID) for a Customer Network Port (CNP), Provider Instance Port (PIP), Customer Backbone 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 ID, it is installed in hardware for the port immediately.

Command Syntax

```
switchport beb vlan <2-4094> (cnp|pip)
switchport beb vlan <2-4094> (cbp|pnp)
switchport beb vlan <2-4094> (cnp|pip|cbp|pnp)
no switchport beb vlan <2-4094> (cnp |pip)
no switchport beb vlan <2-4094> (cnp |pnp)
no switchport beb vlan <2-4094> (cbp |pnp)
```

Parameters

vlan	The VLAN to make the default.
<2-4094>	VLAN ID.
cnp	Configure as a Customer Network Port (CNP).
pip	Configure as a Provider Instance Port (PIP).
cbp	Configure as a Customer Backbone Port (CBP).
pnp	Configure as a Provider Network Port (PNP).

Command Mode

Interface mode

Examples

```
#configure terminal
(config-if)#switchport beb vlan 2 cnp
(config-if)#no switchport beb vlan 2 pnp
```

switchport mode (cnp|pip|cbp|pnp)

Use this command to set the switching characteristics of the Layer 2 interface.

Command Syntax

```
switchport mode (cnp|pip|cbp|pnp)
```

Parameters

cnp	Customer network port: an S-VLAN port that receives and transmits frames for a single customer.
pip	Provider instance port.
cbp	Customer backbone port.
pnp	Provider network port: An S-VLAN port that receives and transmits frames for multiple customers.

Command Mode

Interface mode

Example

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


CHAPTER 10 Provider Backbone Bridging CFM Commands

The chapter includes the commands that manage Connectivity Fault Management (CFM) for Provider Backbone Bridging. It includes the following commands:

Note: Provider Backbone Bridging is not supported for ZebIC releases.

- [1dm](#) on page 251
- [1dm receive](#) on page 252
- [ais interval](#) on page 253
- [ais status](#) on page 254
- [cc](#) on page 255
- [cc multicast](#) on page 256
- [cc unicast](#) on page 257
- [clear ethernet cfm pbb errors](#) on page 258
- [clear ethernet cfm pbb maintenance-points](#) on page 259
- [clear ethernet cfm pbb traceroute-cache](#) on page 260
- [dmm](#) on page 261
- [dvm](#) on page 262
- [ethernet cfm pbb cc enable](#) on page 263
- [ethernet cfm pbb domain-name type](#) on page 264
- [ethernet cfm pbb mep](#) on page 266
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- [ethernet cfm pbb traceroute cache size](#) on page 270
- [exm tx](#) on page 271
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- [mep pbb crosscheck mpid](#) on page 275
- [out-of-service](#) on page 276
- [pbb mep mpid](#) on page 277
- [ping ethernet pbb mac](#) on page 278
- [ping ethernet pbb mpid](#) on page 279
- [ping ethernet pbb multicast](#) on page 280
- [ping ethernet pbb unicast](#) on page 282
- [service pbb](#) on page 284
- [show ethernet cfm pbb ais](#) on page 285
- [show ethernet cfm pbb errors](#) on page 286

- [show ethernet cfm pbb maintenance-points local](#) on page 287
- [show ethernet cfm pbb maintenance-points remote](#) on page 288
- [show ethernet cfm pbb traceroute-cache](#) on page 289
- [throughput-measurement](#) on page 290
- [traceroute pbb ethernet](#) on page 291
- [tst](#) on page 292
- [vsm tx](#) on page 293

1dm

Use this command to enable one-way delay-measurement (1DM) (unicast or multicast) messaging from a MEP.

Command Syntax

```
1dm unicast rmpid MEPID duration DURATION ((interval (1 | 2 | 3 | 4)))  
1dm multicast duration DURATION ((interval (1 | 2 | 3 | 4)))
```

Parameters

multicast	Multicast delay measurements.
unicast	Unicast or multicast delay measurements.
rmpid	MEPID of remote MEP
duration	The duration of the delay measurements in the range of <5-60> seconds.
interval	DMM transmission interval
1	Set delay measurement interval to 100 milliseconds.
2	Set delay measurement interval to 10 milliseconds.
3	Set delay measurement interval to 1 second.
4	Set delay measurement interval to 10 seconds.

Command Mode

Ethernet CFM PBB MEP configuration mode

Examples

```
(config-cfm-pbb-mep)#1dm unicast rmpid 1 duration 6  
(config-cfm-pbb-mep)#1dm multicast duration 60
```

1dm receive

Use this command to receive one-way delay-measurement (1DM) frames and specify the duration.

Command Syntax

```
1dm receive duration DURATION
```

Parameters

<code>duration</code>	The duration of the delay measurements in seconds <5-60>.
-----------------------	---

Command Mode

Ethernet CFM PBB MEP configuration mode

Examples

```
(config-cfm-pbb-mep)#1dm receive duration 10
```

ais interval

Use this command to set the transmission interval for Alarm Indicator Signaling (AIS) for a MEP.

Command Syntax

```
ais interval TX_INTERVAL
```

Parameters

<code>interval</code>	AIS transmission interval in seconds; valid values are 1 or 60.
-----------------------	---

Command Mode

Ethernet CFM PBB MEP configuration mode

Examples

```
(config-cfm-pbb-mep)#ais interval 60  
(config-cfm-pbb-mep)#ais interval 10
```

ais status

Use this command to enable or disable Alarm Indicator Signaling (AIS).

Command Syntax

```
ais status (enable | disable) unicast RMEP_MAC level <0-7>
ais status (enable | disable) multicast level <0-7>
```

Parameters

disable	Specify to disable AIS
enable	Specify to enable AIS
multicast	Configure multicast AIS.
unicast	Configure unicast AIS.
RMEP_MAC	Enter the remote MEP MAC address in HHHH.HHHH.HHHH format
level	Indicate a level at which to send the AIS frames

Command Mode

Ethernet CFM PBB MEP configuration mode

Examples

```
(config-cfm-pbb-mep)#ais status enable multicast level 1
(config-cfm-pbb-mep)#ais status enable unicast 1111.1111.1111 level 1
```

CC

Use this command to enable continuity checking for provider backbone bridging and to set the interval.

Command Syntax

```
cc (interval (1 | 2 | 3 | 4 | 5 | 6 | 7))
```

Parameters

interval	The continuity checking interval (CCI):
1	3 milliseconds.
2	10 milliseconds.
3	100 milliseconds.
4	1 seconds.
5	10 seconds.
6	1 minute.
7	10 minutes.

Command Mode

Ethernet CFM PBB MEP configuration mode

Examples

```
(config-cfm-pbb-mep)#cc interval 3  
(config-cfm-pbb-mep)#cc interval 1 bridge 1
```

cc multicast

Use this command to enable or disable multicast continuity checking (CC).

Syntax

```
cc multicast state (enable|disable)
```

Parameters

enable	Enable continuity checking for multicast.
disable	Disable continuity checking for multicast.

Command Mode

Interface Ethernet CFM PBB MEP configuration mode

Examples

```
#configure terminal
(config)#interface eth1
(config-if)#ethernet cfm pbb mep down mpid 23 domain-name abc bridge 1
(config-if-eth-cfm-pbb-mep)#cc multicast state enable
```

cc unicast

Use this command to enable or disable unicast continuity checking (CC).

Syntax

```
cc unicast rmpid RMEPID state (enable | disable)
```

Parameters

rmpid	Remote MEP ID.
state	Set the continuity check state
enable	Enable the continuity checking state for unicast.
disable	Disable the continuity checking state for unicast.

Command Mode

Interface Ethernet CFM PBB MEP configuration mode

Examples

```
#configure terminal
(config)#interface eth1
(config-if)#ethernet cfm pbb mep down mpid 23 domain-name abc bridge 1
(config-if-eth-cfm-pbb-mep)#cc unicast rmpid 3 state enable
```

clear ethernet cfm pbb errors

Use this command to clear connectivity fault management errors in a maintenance domain on a bridge or provider backbone bridge.

Command Syntax

```
clear ethernet cfm pbb errors domain-name DOMAIN_NAME (bridge <1-32> | backbone)
```

Parameters

domain-name	Maintenance domain name.
DOMAIN_NAME	Maintenance domain name.
bridge	Specify a bridge group name.
<1-32>	Specify a bridge ID.
backbone	Identifies the bridge as a backbone.

Command Mode

Exec mode and Privileged Exec mode

Examples

```
#clear ethernet cfm pbb errors domain-name abc bridge 1
#clear ethernet cfm pbb errors domain-name abc backbone
```

clear ethernet cfm pbb maintenance-points

Use this command to clear connectivity fault management errors on a remote maintenance point within the domain and on a bridge or provider backbone bridge.

Command Syntax

```
clear ethernet cfm pbb maintenance-points remote domain-name DOMAIN_NAME  
(bridge <1-32> | backbone)
```

Parameters

domain-name	Maintenance domain name.
DOMAIN_NAME	Maintenance domain name.
bridge	Specify a bridge group name.
<1-32>	Specify a bridge ID.
backbone	Identifies the bridge as a backbone.

Command Mode

Exec mode and Privileged Exec mode

Examples

```
#clear ethernet cfm pbb maintenance-points remote domain-name abc bridge 1  
#clear ethernet cfm pbb maintenance-points remote domain-name ipi backbone
```

clear ethernet cfm pbb traceroute-cache

Use this command to clear traceroute cache for connectivity fault management on a bridge or provider backbone bridge.

Command Syntax

```
clear ethernet cfm pbb traceroute-cache (bridge <1-32> | backbone)
```

Parameters

bridge	Specify a bridge group name.
<1-32>	Specify a bridge ID.
backbone	Identifies the bridge as a backbone.

Command Mode

Exec mode and Privileged Exec mode

Examples

```
#clear ethernet cfm pbb traceroute-cache bridge 1
#clear ethernet cfm pbb traceroute-cache backbone
```

dmm

Use this command to enable two-way delay measurement messaging (DMM) (unicast or multicast) from a MEP.

Syntax

```
dmm unicast rmpid MEPID duration DURATION ((interval (1 | 2 | 3 | 4)))  
dmm multicast duration DURATION ((interval (1 | 2 | 3 | 4)))
```

Parameters

unicast	Configure unicast or multicast delay measurements.
rmpid	MEPID of remote MEP
multicast	Configure unicast or multicast delay measurements.
duration	The duration of the delay measurements in the range of <5-60> seconds.
interval	DMM transmission interval
1	Set delay measurement interval to 100 milliseconds.
2	Set delay measurement interval to 10 milliseconds.
3	Set delay measurement interval to 1 second.
4	Set delay measurement interval to 10 seconds.

Command Mode

Ethernet CFM PBB MEP configuration mode

Examples

```
(config-cfm-pbb-mep)#dmm multicast duration 5  
(config-cfm-pbb-mep)#dmm unicast rmpid 1 duration 5
```

dvm

Use this command to enable delay variation measurement (DVM) (unicast or multicast) messaging from a MEP.

Syntax

```
dvm unicast rmpid MEPID duration DURATION ((interval (1 | 2 | 3 | 4)))
dvm multicast duration DURATION ((interval (1 | 2 | 3 | 4)))
```

Parameters

unicast	Configure unicast or multicast delay measurements.
rmpid	MEPID of remote MEP
multicast	Configure unicast or multicast delay measurements.
duration	The duration of the delay measurements in the range of <5-60> seconds.
interval	DMM transmission interval
1	Set delay measurement interval to 100 milliseconds.
2	Set delay measurement interval to 10 milliseconds.
3	Set delay measurement interval to 1 second.
4	Set delay measurement interval to 10 seconds.

Command Mode

Ethernet CFM PBB MEP configuration mode

Examples

```
(config-cfm-pbb-mep)#dvm multicast duration 5
(config-cfm-pbb-mep)#dvm unicast rmpid 1 duration 5
```

ethernet cfm pbb cc enable

Use this command to enable continuity checking (CC) for the MEP in a domain, using a VLAN or the service instance, and a bridge or a backbone bridge to identify the target.

Note: To enable CC on a link-level MEP, do not enter a VLAN_ID.

Syntax

```
ethernet cfm pbb cc enable domain-name DOMAIN_NAME mep MEPID
((vlan VLAN_ID | isid ISID) | (bridge <1-32> | backbone))
```

Parameters

domain-name	Specify the name of the domain.
DOMAIN_NAME	Specify the name of the domain.
mep	The identity of the host MEP.
MEPID	Specify the host MEP ID.
vlan	Identifies a VLAN.
VLAN_ID	VLAN ID.
isid	Identifies a service instance.
ISID	Specify the Ethernet service instance ID <1-16777214>.
bridge	Identifies a bridge.
<1-32>	Bridge ID.
backbone	Identifies the bridge as a backbone.

Command Mode

Interface mode

Examples

```
#configure terminal
(config)#interface eth1
(config-if)#ethernet cfm pbb cc enable domain abc mep 23 vlan 9 backbone
(config-if)#ethernet cfm pbb cc enable domain ipi mep 23 isid 10 bridge 3
```

ethernet cfm pbb domain-name type

Use these commands to create and configure a domain based on domain name and type, to set MIP creation permissions, and topology type. The type of topology, E-NNI or H-ENNI, is configured when a domain is created because it is common to all the CFM flow points and provides additional validation for port-type configuration.

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

Command Syntax

```
ethernet cfm pbb domain-name type ((no-name name NO_NAME) | (dns-based name
DOMAIN_NAME) | (character-string name DOMAIN_NAME)) pbb-domain-type
(svid|service|bvlan|link) level LEVEL (mip-creation (none|default|explicit))
(bridge <1-32> | backbone) ((p-enni | h-enni))

ethernet cfm pbb domain-name type mac name DOMAIN_NAME pbb-domain-type
(svid|service|bvlan|link) level LEVEL mip-creation (none|default|explicit)
(bridge <1-32> | backbone) ((p-enni | h-enni))

ethernet cfm pbb domain-name type itut-t name DOMAIN_NAME pbb-domain-type
(svid|service|bvlan|link) level LEVEL mip-creation (none|default|explicit) (bridge
<1-32> | backbone) ((p-enni | h-enni))

no ethernet cfm pbb domain-type (svid|service|bvlan|link) name DOMAIN_NAME
level LEVEL (mip-creation (none|default|explicit)) (bridge <1-32> | backbone)
((p-enni | h-enni))
```

Parameters

<code>type</code>	Specify the name type.
<code>no-name name</code>	Specify the name type has no maintenance domain name.
<code>NO_NAME</code>	Enter the name.
<code>dns-based name</code>	Specify the name as domain-name based.
<code>DOMAIN_NAME</code>	Enter the domain name
<code>character-string name</code>	Specify the name as a character string.
<code>DOMAIN_NAME</code>	Enter the domain name
<code>itut-t name</code>	Specify the name in ITU-T carrier code (ICC) format.
<code>DOMAIN_NAME</code>	Enter the domain name
<code>mac name</code>	Specify the name as MAC address + 2-octet integer.
<code>DOMAIN_NAME</code>	Enter the domain name
<code>pbb-domain-type</code>	

	Specify the type of domain for CFM in PBB.
svid	SVID domain.
service	Service Instance domain.
bvlan	B-VLAN domain.
link	Link-level domain.
level	Level.
LEVEL	Enter the level <0-7>I.
mip-creation	Specify a MIP creation permission value.
none	Specify that no MIP may be created for the VID.
default	Specify that a MIP can be created for a VID on the bridge.
explicit	Specify that a MIP can be created for the VID only on ports which the VID can pass.
bridge	Identifies a bridge.
<1-32>	Bridge ID.
backbone	Identifies the bridge as a backbone.
p-enni	Peer-extended network-to-network interface.
h-enni	Hierarchical-extended network-to-network interface.

Command Mode

Configure mode

Examples

```
#configure terminal
(config)#ethernet cfm pbb domain-name type character-string name ipi pbb-
domain-type link level 0 bridge 1

(config)#ethernet cfm pbb domain-name type character-string name ipi pbb-
domain-type bvlan level 3 mip-creation default backbone

(config)#ethernet cfm pbb domain-name type no-name name ipi pbb-domain-type
link level 0 bridge 1

(config)#ethernet cfm pbb domain-name type itut-t name ipi pbb-domain-type
bvlan level 3 mip-creation default backbone

(config)#ethernet cfm pbb domain-name type no-name name ipi pbb-domain-type
service level 3 mip-creation default bridge 32

(config)#ethernet cfm pbb domain-name type mac name ipi pbb-domain-type
service level 3 mip-creation default bridge 1 h-enni

(config)#no ethernet cfm pbb domain-type link name abc level 0 bridge 1
```

ethernet cfm pbb mep

Use this command to create a MEP on a PBB.

Use the `no` form of this command to delete a MEP.

Note: To create and configure a link-level MEP, or to remove one, do not enter a VLAN ID.

Command Syntax

```
ethernet cfm pbb mep (down|up) mpid MEPID domain-name NAME
(((vlan VLAN_ID (local-vid VID|))| isid ISID) (cbp-service-domain isid ISID |))
(bridge <1-32> | backbone)

no ethernet cfm pbb mep (down|up) mpid MEPID domain-name NAME
(((vlan VLAN_ID (local-vid VID|))| isid ISID) (cbp-service-domain isid ISID |))
(bridge <1-32> | backbone)
```

Parameters

<code>down</code>	Set the MEP's direction of flow to down.
<code>up</code>	Set the MEP's direction of flow to up.
<code>mpid</code>	Identity the source MEP.
<code>MEPID</code>	Source MEP ID.
<code>domain-name</code>	The name of the maintenance domain.
<code>DOMAIN_NAME</code>	The name of the maintenance domain.
<code>vlan</code>	Identify a VLAN
<code>VLAN_ID</code>	VLAN ID.
<code>local-vid</code>	Set the local VID for the MEP; this should be a secondary VID for the MA.
<code>VID</code>	Enter the local VID for the MEP.
<code>isid</code>	Identify an associated service instance.
<code>ISID</code>	Specify the Ethernet service instance ID <1-16777214>.
<code>cbp-service-domain</code>	
	ISID for MEP at the CBP in a service domain.
<code>isid</code>	ISID for MEP at the CBP in a service domain.
<code>ISID</code>	Specify the Ethernet service instance ID <1-16777214>.
<code>bridge</code>	Identify a bridge.
<code><1-32></code>	Bridge ID.
<code>backbone</code>	Identify the bridge as a backbone.

Command Mode

Interface mode

Examples

```
(config)#interface eth1
(config-if)#ethernet cfm pbb mep down mpid 23 domain-name abc bridge 1
```

```
(config-if)#ethernet cfm pbb mep down mpid 23 domain-name abc vlan 3 backbone  
(config-if)#ethernet cfm pbb mep up mpid 2 domain-name ab isid 3 bridge 1
```

ethernet cfm pbb server-ais

Use this command to configure a MEP server for AIS.

Command Syntax

```
ethernet cfm pbb server-ais status (enable|disable) level LEVEL
(interval TX_INTERVAL|) (bridge <1-32> | backbone )
```

Parameters

status	Set the status of a MEP server
disable	Set to disable a MEP server for AIS
enable	Set to enable MEP server for AIS
level	The level at which AIS frames are to be sent.
LEVEL	Set the level at which AIS frames are to be sent <1-7>.
interval	The transmission interval for AIS frames.
TX_INTERVAL	Set a transmission interval for AIS frames <1-10>.
bridge	Identifies a bridge.
<1-32>	Bridge ID.
backbone	Identifies the bridge as a backbone.

Command Mode

Interface mode

Example

```
(config)#interface eth1
(config-if)#ethernet cfm pbb server-ais status disable level 1 interval 1
backbone
```

ethernet cfm pbb traceroute cache

Use this command to enable traceroute cache for a bridge or provider backbone.

Use the `no` form of this command to disable the traceroute cache.

Command Syntax

```
ethernet cfm pbb traceroute cache (bridge <1-32>|backbone)
no ethernet cfm pbb traceroute cache (bridge <1-32>|backbone)
```

Parameters

bridge	Identify a bridge.
<1-32>	Bridge ID.
backbone	Identify the bridge as a backbone.

Command Mode

Configure mode

Examples

```
(config)#ethernet cfm pbb traceroute cache bridge 1
(config)#ethernet cfm pbb traceroute cache size 29 bridge 1
(config)#no ethernet cfm pbb traceroute cache size bridge 1
(config)#no ethernet cfm pbb traceroute cache bridge 1
```

ethernet cfm pbb traceroute cache size

Use this command to set a traceroute cache size for a bridge or a backbone.

Use the `no` form of this command to remove the traceroute cache size.

Command Syntax

```
ethernet cfm pbb traceroute cache size ENTRIES (bridge <1-32> | backbone)
no ethernet cfm pbb traceroute cache size (bridge <1-32>|backbone )
```

Parameters

bridge	Identify a bridge.
<1-32>	Bridge ID.
backbone	Identify the bridge as a backbone.
size	Indicates the size of the cache.
ENTRIES	Indicates the size of the cache.

Command Mode

Configure mode

Examples

```
(config)#ethernet cfm pbb traceroute cache bridge 1
(config)#ethernet cfm pbb traceroute cache size 29 bridge 1
(config)#no ethernet cfm pbb traceroute cache size bridge 1
(config)#no ethernet cfm pbb traceroute cache bridge 1
```

exm tx

Use this command to enable transmission of Ethernet experimental OAM messages (EXM) from a MEP to a remote MEP.

Command Syntax

```
exm tx unicast rmepid RMEPID
```

Parameters

<code>rmepid</code>	Remote MEP ID (RMEPID).
---------------------	-------------------------

Command Mode

Ethernet CFM PBB MEP configuration mode

Examples

```
(config-cfm-pbb-mep)#exm tx unicast rmepid 3
```

in-service

Use this command to enable in-service testing.

Command Syntax

```
in-service testing
```

Parameters

None

Command Mode

Ethernet CFM PBB MEP configuration mode

Examples

```
(config-cfm-pbb-mep)#in-service testing
```

Imm

Use this command to configure Loss Measurement Messaging (LMM) for CFM frames.

Command Syntax

```
lmm unicast rmepid RMEPID duration <5-60> ((interval (1 | 2 | 3 | 4)))  
lmm multicast duration <5-60> ((interval (1 | 2 | 3 | 4)))
```

Parameters

unicast	Unicast the LMM frames.
rmepid	ID of the remote MEP.
multicast	Multicast the LMM frames.
duration	The duration in seconds <5-60>.
interval	The LMM transmission interval:
1	100 milliseconds.
2	10 milliseconds.
3	1 second.
4	10 seconds.

Command Mode

Ethernet CFM PBB MEP configuration mode

Examples

```
(config-cfm-pbb-mep)#lmm unicast rmepid 3 duration 10 interval 1  
(config-cfm-pbb-mep)#lmm multicast duration 5 interval 2
```

mcc tx

Use this command to enable Maintenance Communication Channel (MCC) message transmission (tx) from a MEP.

Command Syntax

```
mcc tx multicast
mcc tx unicast rmepid RMEPID
```

Parameters

multicast	Send multicast MCC frames.
unicast	Send unicast MCC frames.
rmepid	Remote MEP ID.

Command Mode

Ethernet CFM PBB MEP configuration mode

Examples

```
(config-cfm-pbb-mep)#mcc tx unicast rmepid 2
(config-cfm-pbb-mep)#mcc tx multicast
```

mep pbb crosscheck mpid

Use this command to configure CFM crosschecking for a PBB.

Use the `no` form of this command to remove crosschecking for a PBB.

Note: To configure crosschecking on a remote MEP in a link-level MA, do not enter a VLAN ID.

Syntax

```
mep pbb crosscheck mpid MEPID ((vlan VLANID)|(isid ISID)) (|mac MAC)
no mep pbb crosscheck mpid MEPID ((vlan VLANID)|(isid ISID)) (|mac MAC)
```

Parameters

mep	Identity of the remote MEP.
MEPID	Remote MEP ID.
vlan	Identify a VLAN
VLAN_ID	VLAN ID.
isid	Identify an associated service instance.
ISID	Specify the Ethernet service instance ID <1-16777214>.
mac	Remote MAC address. This is mandatory for unicast messages.
MAC	Remote MAC address in HHHH.HHHH.HHHH format.

Command Mode

Ethernet CFM mode

Examples

```
(config)#ethernet cfm domain-name type character-string name domain1 level 7
mip-creation default
(config-ether-cfm)#mep crosscheck pbb mpid 2 isid 10
(config-ether-cfm)#mep crosscheck pbb mpid 3 isid 15 mac 1212.2222.6777
(config-ether-cfm)#mep crosscheck pbb mpid 6 vid 14
```

out-of-service

Use this command to enable out-of-service testing.

Command Syntax

```
out-of-service lck-level <0-7> testing
```

Parameters

`lck-level` The level at which LCK frames should be sent.

Command Mode

Ethernet CFM PBB MEP configuration mode

Examples

```
(config-cfm-pbb-mep)#out-of-service lck-level 4 testing  
(config-cfm-pbb-mep)#out-of-service lck-level 2 testing
```

pbb mep mpid

Use this command to enter Ethernet CFM PBB MEP configuration mode where you can configure the given MEP.

Syntax

```
pbb mep mpid MPID ((vlan VLAN_ID | isid ISID) |)
```

Parameters

mpid	MEP.
MPID	MEP ID <1-8191>.
vlan	VLAN.
VLANID	VLAN ID <1-4094>.
isid	Service instance.
ISID	Service instance ID <1-16777214>.

Command Mode

Ethernet CFM PBB configuration mode

Examples

```
(config-ether-cfm-pbb)#pbb mep mpid 87
(config-cfm-pbb-mep)#
```

ping ethernet pbb mac

Use this command to send a loopback message to a destination MAC address on which the CFM frames are unicast from the host MEP in the domain specified. The type, length, value (TLV) data values and the bridge type parameters are also passed in this command.

Note: To start loopback messages for a link-level MEP, do not enter a VLAN_ID.

Command Syntax

```
ping ethernet pbb mac MACADDRESS unicast source MEPID domain-name DOMAIN_NAME
((vlan VLAN_ID | isid ISID)) (tlv (data VAL | test (1 | 2 | 3 |4)))
(bridge <1-32> | backbone)
```

Parameters

mac	Remote MAC address.
MAC	Remote MAC address in HHHH.HHHH.HHHH format.
source	Source MEP.
MEPID	An integer that identifies the source MEP.
domain-name	The name of the maintenance domain.
DOMAIN_NAME	The name of the maintenance domain.
vlan	Identify a VLAN
VLAN_ID	VLAN ID.
isid	Identify an associated service instance.
ISID	Specify the Ethernet service instance ID <1-16777214>.
tlv	Type, length, value.
data	TLV data.
VAL	Data value.
test	TVL type:
1	Test pattern: abc.
2	Test pattern: 1234.
3	Test pattern: a1b2c.
4	Test pattern: 1a2b3c.
bridge	Identify a bridge.
<1-32>	Bridge ID.
backbone	Identify the bridge as a backbone.

Command Mode

Exec mode and Privileged Exec mode

Examples

```
#ping ethernet pbb mac 02.de.df unicast source 4 domain-name ipi vlan 2 tlv
data 3 bridge 1
#ping ethernet pbb mac 1.1.1 unicast source 23 domain-name abc isid 10 tlv
test 2 backbone
```

ping ethernet pbb mpid

Use this command to send a loopback message to a maintenance end point using the ISID or the VLAN_ID as the identifier in the named domain.

Note: Use this command only when HAVE_Y1731 is *not* defined.

Command Syntax

```
ping ethernet pbb mpid MEPID domain-name DOMAIN_NAME ((vlan VLAN_ID)|(isid ISID))
    (bridge <1-32> | backbone )
```

Parameters

mpid	Source MEP.
MEPID	An integer that identifies the source MEP.
domain-name	The name of the maintenance domain.
DOMAIN_NAME	The name of the maintenance domain.
vlan	Identify a VLAN
VLAN_ID	VLAN ID.
isid	Identify an associated service instance.
ISID	Specify the Ethernet service instance ID <1-16777214>.
bridge	Identify a bridge.
<1-32>	Bridge ID.
backbone	Identify the bridge as a backbone.

Command Mode

Exec mode

Examples

```
#ping ethernet pbb mpid 12 domain-name abc vlan 10 bridge 2
#ping ethernet pbb mpid 12 domain-name abc isid 100 backbone
```

ping ethernet pbb multicast

Use these commands to send a multicast loopback message.

Note: To initiate loopback messages in a link-level MEP, do not enter a VLAN_ID in the command line. Use this command when HAVE_Y1731 is defined.

Command Syntax

```
ping ethernet pbb multicast mepid MEPID domain-name DOMAIN_NAME
((vlan VLAN_ID | isid ISID)) (tlv (data VAL | test (1 | 2 | 3 |4)))
(bridge <1-32> | backbone)

ping ethernet pbb multicast recursive mepid MEPID domain-name DOMAIN_NAME
((vlan VLAN_ID | isid ISID)) (tlv (data VAL | test (1 | 2 | 3 |4)))
(bridge <1-32> | backbone)
```

Parameters

recursive	Send recursive multicast frames (5 frames).
mepid	Source MEP.
MEPID	An integer that identifies the source MEP.
domain-name	The name of the maintenance domain.
DOMAIN_NAME	The name of the maintenance domain.
vlan	Identify a VLAN
VLAN_ID	VLAN ID.
isid	Identify an associated service instance.
ISID	Specify the Ethernet service instance ID <1-16777214>.
tlv	Type, length, value.
data	TLV data.
VAL	Data value.
test	TVL type:
1	Test pattern: abc.
2	Test pattern: 1234.
3	Test pattern: a1b2c.
4	Test pattern: 1a2b3c.
bridge	Identify a bridge.
<1-32>	Bridge ID.
backbone	Identify the bridge as a backbone.

Command Mode

Exec mode and Privileged Exec mode

Examples

```
#ping ethernet pbb multicast recursive mepid 2 domain-name abc isid 2 tlv data
2 bridge 1
```



```
#ping ethernet pbb unicast rmep 3 mepid 23 domain-name abc vlan 4094 tlv test  
1 backbone  
#ping ethernet pbb multicast mepid 23 domain-name abc backbone  
#ping ethernet pbb multicast mepid 23 domain-name abc vlan 3 backbone
```

ping ethernet pbb unicast

Use this command to send a unicast loopback message.

Note: To start loopback messages in a link-level MEP, do not enter a VLAN ID.

Command Syntax

```
ping ethernet pbb unicast rmepid RMEPID mepid MEPID domain-name DOMAIN_NAME
((vlan VLAN_ID | isid ISID)) (tlv (data VAL | test (1 | 2 | 3 | 4)))
(bridge <1-32> | backbone)
```

Parameters

rmepid	Remote MEP.
RMEPID	Remote MEP. ID
mepid	Source MEP.
MEPID	Source MEP ID.
domain-name	The name of the maintenance domain.
DOMAIN_NAME	The name of the maintenance domain.
vlan	Identify a VLAN
VLAN_ID	VLAN ID.
isid	Identify an associated service instance.
ISID	Specify the Ethernet service instance ID <1-16777214>.
tlv	Type, length, value.
data	TLV data.
VAL	Data value.
test	TVL type:
1	Test pattern: abc.
2	Test pattern: 1234.
3	Test pattern: a1b2c.
4	Test pattern: 1a2b3c.
bridge	Identify a bridge.
<1-32>	Bridge ID.
backbone	Identify the bridge as a backbone.

Command Mode

Exec mode and Privileged Exec mode

Examples

```
#ping ethernet pbb unicast rmep 3 mepid 2 domain-name abc isid 2 tlv data 2
bridge 1
#ping ethernet pbb unicast rmep 3 mepid 23 domain-name abc vlan 4094 tlv test
1 backbone
#ping ethernet pbb unicast rmep 3 mepid 23 domain-name abc backbone
#ping ethernet pbb unicast rmep 3 mepid 23 domain-name abc vlan 3 backbone
```

service pbb

Use this command to create a maintenance association (MA).

Use the `no` form of this command to delete an MA.

Syntax

```
service pbb ma-type (primary-vid | string | integer | vpn-id) ma-name MA_NAME
  (((vlan VLAN_ID)|(isid ISID)) mip-creation (none|default|explicit|defer))

no service pbb CSI_ID (((vlan VLAN_ID)|(isid ISID))
  mip-creation (none|default|explicit|defer))
```

Parameters

ma-type	Type of maintenance association name:
primary-vid	Primary VID.
string	Character string.
integer	Integer.
vpn-id	VPN ID.
ma-name	Maintenance association name.
MA_NAME	Maintenance association name.
vlan	Identify a VLAN.
VLAN_ID	VLAN ID.
isid	Identify an associated service instance.
ISID	Specify the Ethernet service instance ID <1-16777214>.
mip-creation	Specify a MIP creation permission value.
none	Specify that no MIP may be created for the VID.
default	Specify that a MIP can be created for a VID on the bridge.
explicit	Specify that a MIP can be created for the VID only on ports which the VID can pass.
defer	In the MA only, control of MHF creation is deferred to the corresponding variable in the enclosing MD
CSI_ID	Maintenance association name.

Command Mode

Ethernet CFM mode

Examples

```
#configure terminal
(config)#ethernet cfm pbb-te domain ipi level 2 bridge backbone
(config-ether-cfm-pbb)#service pbb 12 isid 3
(config-ether-cfm-pbb)#service pbb ma-type string ma-name 13 vid 3
(config-ether-cfm-pbb)#service pbb ma-type string ma-name 14
(config-ether-cfm-pbb)#no service pbb 12 vlan 3
```

show ethernet cfm pbb ais

Use this command to display reception status information for AIS frames received on a maintenance end point in the configured domain for the service instance or VLAN and bridge specified.

Note: To display AIS frame status for a link-level MEP, do not enter a VLAN ID.

Command Syntax

```
show ethernet cfm pbb ais reception-status mep MEPID domain-name DOMAIN_NAME
((vlan VLAN_ID) | (isid ISID)) (bridge <1-32> | backbone)
```

Parameters

mepid	Host MEP.
MEPID	Host MEP ID.
domain-name	The name of the maintenance domain.
DOMAIN_NAME	The name of the maintenance domain.
vlan	Identify a VLAN
VLAN_ID	VLAN ID.
isid	Identify an associated service instance.
ISID	Specify the Ethernet service instance ID <1-16777214>.
bridge	Identify a bridge.
<1-32>	Bridge ID.
backbone	Identify the bridge as a backbone.

Command Mode

Exec mode and Privileged Exec mode

Examples

```
#show ethernet cfm pbb ais reception-status mep 42 domain-name abc vlan 10
backbone
```

show ethernet cfm pbb errors

Use this command to display connectivity fault management error information for a bridge or backbone.

Command Syntax

```
show ethernet cfm pbb errors domain-name DOMAIN_NAME (bridge <1-32> | backbone)
```

Parameters

domain-name	The name of the maintenance domain.
DOMAIN_NAME	The name of the maintenance domain.
bridge	Identify a bridge.
<1-32>	Bridge ID.
backbone	Identify the bridge as a backbone.

Command Mode

Exec mode and Privileged Exec mode

Example

```
#show ethernet cfm pbb errors domain-name abc bridge 1
#show ethernet cfm pbb errors domain-name abc backbone
```

show ethernet cfm pbb maintenance-points local

Use this command to display CFM statistics for local maintenance end points or maintenance intermediate points for an interface within a specific domain that are associated with a particular bridge or a backbone bridge.

Command Syntax

```
show ethernet cfm pbb maintenance-points local (mep|mip)
(interface IFNAME|domain-name DOMAIN_NAME) (bridge <1-32> | backbone)
```

Parameters

mep	Display MEP (Maintenance End Points) statistics.
mip	Display MIP (Maintenance Intermediate Points) statistics.
interface	Display the interface name.
IFNAME	The name of the interface.
domain-name	The name of the maintenance domain.
DOMAIN_NAME	The name of the maintenance domain.
bridge	Identify a bridge.
<1-32>	Bridge ID.
backbone	Identify the bridge as a backbone.

Command Mode

Exec mode and Privileged Exec mode

Example

```
#show ethernet cfm pbb maintenance-points local mep domain-name abc bridge 3
```

show ethernet cfm pbb maintenance-points remote

Use these commands to display CFM statistics for remote maintenance points.

Command Syntax

```
show ethernet cfm pbb maintenance-points remote domain-name DOMAIN_NAME
(((vlan VLAN_ID)|(isid ISID))) (bridge <1-32> | backbone)

show ethernet cfm pbb maintenance-points remote (mpid MEP_ID| mac MAC_ADDRESS)
domain-name DOMAIN_NAME (((vlan VLAN_ID)|(isid ISID)))
(bridge <1-32> | backbone)
```

Parameters

domain-name	The name of the maintenance domain.
DOMAIN_NAME	The name of the maintenance domain.
mpid	Remote MEP.
MEPID	Remote MEP ID.
mac	MAC address of the remote MEP.
MAC_ADDRESS	Enter the remote MEP MAC address in HHHH.HHHH.HHHH format
vlan	Identify a VLAN
VLAN_ID	VLAN ID.
isid	Identify an associated service instance.
ISID	Specify the Ethernet service instance ID <1-16777214>.
bridge	Identify a bridge.
<1-32>	Bridge ID.
backbone	Identify the bridge as a backbone.

Command Mode

Exec mode and Privileged Exec mode

Examples

```
#show ethernet cfm pbb maintenance-points remote mac 1.1.1.1.1 domain-name new
backbone
```

```
#show ethernet cfm pbb maintenance-points remote mac 1111.1111.111 domain-
name new vlan 12 backbone
```

show ethernet cfm pbb traceroute-cache

Use this command to display CFM traceroute cache information for a bridge or a backbone.

Command Syntax

```
show ethernet cfm pbb traceroute-cache (bridge <1-32>|backbone)
```

Parameters

bridge	Identify a bridge.
<1-32>	Bridge ID.
backbone	Identify the bridge as a backbone.

Command Mode

Exec mode and Privileged Exec mode

Example

```
#show ethernet cfm pbb traceroute-cache bridge 1
```

throughput-measurement

Use this command to:

1. Enable reception of test (TST) frames for throughput measurement for a MEP.
2. Configure throughput-measurement unicast TST frames from a MEP to a remote MEP.

Command Syntax

```
throughput-measurement reception duration <1-10>
throughput-measurement unicast rmepid RMEPID
```

Parameters

<code>unicast</code>	Send unicast TST frames
<code>rmepid</code>	Remote MEP ID.
<code>duration</code>	Maximum duration in seconds to wait for TST frames before timing out.

Command Mode

Ethernet CFM PBB MEP configuration mode

Examples

```
(config-cfm-pbb-mep)#throughput-measurement reception duration 1
(config-cfm-pbb-mep)#throughput-measurement unicast rmepid 5
```

traceroute pbb ethernet

Use this command to send a traceroute request to a remote MEP for the domain, VLAN, and service instance specified.

Command Syntax

```
traceroute pbb ethernet MAC domain-name DOMAIN_NAME ((vlan VLANID | isid ISID) |)
    (bridge <1-32> | backbone)
```

Parameters

MAC	Enter the remote MEP MAC address in HHHH.HHHH.HHHH format
domain-name	The name of the maintenance domain.
DOMAIN_NAME	The name of the maintenance domain.
vlan	Identify a VLAN
VLAN_ID	VLAN ID.
isid	Identify an associated service instance.
ISID	Specify the Ethernet service instance ID <1-16777214>.
bridge	Identify a bridge.
<1-32>	Bridge ID.
backbone	Identify the bridge as a backbone.

Command Mode

Exec mode and Privileged Exec mode

Examples

```
#traceroute pbb ethernet 1.1.1 domain-name abc vlan 10 bridge 2
#traceroute pbb ethernet 22.3f.44 domain-name ipi isid ISID bridge 10
```

tst

This command configures a CFM test signal from a MEP to a remote unicast or multicast MEP and specifies a test pattern.

Command Syntax

```
tst multicast pattern (1 | 2 | 3 | 4) (recursive duration <5-60> interval
TX_INTERVAL|) (lck interval TX_INTERVAL (unicast rmepid RMEPID | multicast)|)

tst unicast RMEPID pattern (1 | 2 | 3 | 4) (recursive duration <5-60> interval
TX_INTERVAL|) (lck interval TX_INTERVAL (unicast rmepid RMEPID | multicast)|)
```

Parameters

multicast	Send multicast test frame
unicast	Send unicast test frame
rmepid	Identity of the remote MEP.
pattern	Test pattern to be sent:
1	Test Pattern: abc.
2	Test Pattern: 1234.
3	Test Pattern: a1b2c.
4	Test Pattern: 1a2b3c.
recursive	Recursively send TST frames.
duration	Number of seconds for which test frames are sent.
interval	The transmission interval value for test frames in seconds <1-10>. If no range is specified, 1 second is the default.
lck	Send lock (LCK) frame in the opposite direction for out-of-service testing
interval	The transmission interval value for test frames in seconds <1-10>. If no range is specified, 1 second is the default. This should be the same as the AIS transmission interval.
unicast	Send unicast LCK frame.
rmepid	Remote MEP ID
multicast	Send multicast LCK frame

Command Mode

Ethernet CFM PBB MEP configuration mode

Examples

```
(config-cfm-pbb-mep)#tst multicast pattern 1 recursive duration 5 interval 10
lck interval 1 multicast

(config-cfm-pbb-mep)#tst unicast 12 pattern 1 recursive duration 8 interval 9
lck interval 9 multicast

(config-cfm-pbb-mep)#tst multicast pattern 1 lck interval 12 multicast

(config-cfm-pbb-mep)#tst multicast pattern 1 lck interval 7
```

vsm tx

Use this command to enable transmission (tx) of vendor-specific OAM messages (VSM) from a MEP to a remote MEP.

Command Syntax

```
vsm tx unicast rmepid RMEPID
```

Parameters

<code>rmepid</code>	Remote MEP ID.
---------------------	----------------

Command Mode

Examples

```
(config-cfm-pbb-mep)#vsm tx unicast rmepid 3
```


CHAPTER 11 PBB-TE Provisioning Commands

This chapter describes the Provider Backbone Bridging — Traffic Engineering (PBB-TE) commands.

The PBB-TE provisioning module supports IB-BEB bridge configuration for PBB-TE Ethernet Protection Switching (EPS) and decoupling of VLANs from spanning tree protocols for traffic engineered linear and Ring Protection Switching (RPS). It also manages functions that interact with hardware via the Hardware Abstraction Layer (HAL).

Note: Provider Backbone Bridging is not supported for ZebIC releases.

- [cbp interface](#)
- [esp egress remote-mac](#)
- [esp egress pnp](#)
- [esp ingress remote-mac](#)
- [exit-pbb-te-esp-mode](#)
- [mode](#)
- [pbb-te configure esp](#)
- [pbb-te configure tesid](#)
- [pbb-te vlan](#)
- [show pbb-te](#)
- [type](#)

cbp interface

Use this command to associate a local CBP (Customer Backbone Port) interface with a TESI (Traffic Engineering Service Instance).

Use the `no` form of the command to dissociate the TESI membership from the given CBP interface.

Command Syntax

```
cbp interface IFNAME
no cbp interface
```

Parameters

IFNAME	The name of the interface.
--------	----------------------------

Command Mode

PBB-TE configure switching mode

Examples

The following is an example of this CLI command.

```
#configure terminal
#(config)#pbb-te configure tesid 3
#pbb-te-config)#cbp interface cbp.1
```

esp egress remote-mac

Use this command to make an ESP (Ethernet Switched Path) the egress path of a TESI.

Use the `no` form of the command to remove an egress ESP.

Command Syntax

```
esp egress remote-mac REMOTE_MAC vlan VLANID
esp egress multicast remote-mac REMOTE_MAC vlan VLANID
no esp egress remote-mac REMOTE_MAC vlan VLANID
```

Parameters

<code>remote-mac</code>	MAC address of remote CBP (Customer Backbone Port).
<code>REMOTE_MAC</code>	Add the remote MAC address in hhhh.hhhh.hhhh format.
<code>vlan</code>	VLAN for this ESP
<code>VLANID</code>	VLAN ID <2-4094>.
<code>multicast</code>	If this is specified, the ESP is point-to-multipoint; otherwise the ESP is point-to-point.

Command Mode

PBB-TE configure switching mode

Examples

```
#configure terminal
(config)#interface cbp.1
(config-if)#no shutdown
(config-if)#pbb-te configure esp tesi 20
(pbb-te-esp-if-config)#esp egress multicast remote-mac 111.1111.1111 vlan 2

(pbb-te-esp-if-config)#no esp egress remote-mac 111.1111.1111 vlan 2
```

esp egress pnp

Use this command to associate a PNP (Provider Network Port) to an egress ESP (Ethernet Switched Path).

Command Syntax

```
esp egress pnp (add | delete) IFNAME
```

Parameters

add	Add a PNP
delete	Delete a PNP
IFNAME	Local CBP (Customer Backbone Port) interface name

Command Mode

PBB-TE configure switching mode

Examples

```
#configure terminal
(config)#interface cbp.1
(config-if)#no shutdown
(config-if)#pbb-te configure esp tesi 20
(pbb-te-esp-if-config)#esp egress pnp add eth3
```

esp ingress remote-mac

Use this command to make an ESP (Ethernet Switched Path) the ingress path of a TESI.

Use the `no` form of the command to remove an ingress ESP.

Command Syntax

```
esp ingress (multicast mcast-mac MULT_SA |) remote-mac REMOTE_MAC vlan VLANID
no esp ingress remote-mac REMOTE_MAC vlan VLANID
```

Parameters

<code>multicast</code>	Indicate that the ESP is multicast.
<code>mcast-mac</code>	Indicate the receive MAC address.
<code>MULT_SA</code>	Add the receive MAC address in hhhh.hhhh.hhhh format.
<code>remote-mac</code>	Specify the MAC address of the remote CBP (Customer Backbone Port).
<code>REMOTE_MAC</code>	Add the remote MAC address in hhhh.hhhh.hhhh format
<code>vlan</code>	VLAN.
<code>VLANID</code>	VLAN ID.

Command Mode

PBB-TE configure switching mode

Examples

```
#configure terminal
(config)#interface cbp.1
(config-if)#no shutdown
(config-if)#pbb-te configure esp tesi 20
(pbb-te-esp-if-config)#esp ingress remote-mac 1111.1111.1111 vlan 55
(pbb-te-esp-if-config)#no esp ingress remote-mac 1111.1111.1111 vlan 55

#configure terminal
(config)#interface cbp.1
(config-if)#no shutdown
(config-if)#pbb-te configure esp tesi 20
(pbb-te-esp-if-config)#esp ingress multicast mcast-mac 1111.1111.1111 remote-
mac 1111.1111.1111 vlan 55
```

exit-pbb-te-esp-mode

Use this command to exit PBB-TE ESP (Ethernet Switched Path) configure mode.

Command Syntax

```
exit-pbb-te-esp-mode
```

Parameters

None

Command Mode

PBB-TE configure switching mode

Examples

The following example enters the PBB-TE ESP provisioning mode.

```
(pbb-te-esp-if-config) #exit-pbb-te-esp-mode  
(config-if) #
```

mode

Use this command to set the mode of the local CBP (Customer Backbone Port) interface that is associated with this TESI (Traffic Engineering Service Instance).

Use the `no` form of this command to set the mode to its default (passive). You can specify a parameter for the `no` form, but it is ignored.

Command Syntax

```
mode (active|passive)
no mode (passive|active|)
```

Parameters

<code>active</code>	Active mode.
<code>passive</code>	Passive mode.

Command Mode

PBB-TE configure mode

Examples

The following is an example of this CLI command.

```
#configure terminal
#(config)#pbb-te configure tesid 3
#(pbb-te-config)#mode active

#(config)#pbb-te configure tesid 3
#(pbb-te-config)#no mode
```

pbb-te configure esp

Use this command to enter PBB-TE ESP (Ethernet Switched Path) configure mode.

Command Syntax

```
pbb-te configure esp tesi TESID
```

Parameters

TESID	Enter the TESI ID.
-------	--------------------

Command Mode

Interface mode

Examples

The following example enters the PBB-TE ESP provisioning mode.

```
(config)#int cbp.1
(config-if)#pbb-te configure esp tesi 3
(pbb-te-esp-if-config)#
```

pbb-te configure tesid

Use this command to enter PBB-TE provisioning mode to configure a TESI (Traffic Engineering Service Instance).

Note: This command does not add a TESI until a VLAN is added to the TE service instance.

Use the `no` form of this command to remove a TESI.

Command Syntax

```
pbb-te configure tesid TESID (name TRUNK_NAME|)
no pbb-te (tesid TESID | name TRUNK_NAME)
```

Parameters

<code>tesid</code>	Enter the TESI.
<code>TESID</code>	Enter the TESI ID for which ESPs must be configured.
<code>name</code>	Trunk name given to the TESI.
<code>TRUNK_NAME</code>	Trunk name given to the TESI.

Command Mode

Configure mode

Example

```
(config)#pbb-te configure tesid 10 name t10
(pbb-te-config)#
```

pbb-te vlan

Use this command to add a VLAN to a TESI (Traffic Engineering Service Instance). This command works on a Backbone Edge Bridge (BEB).

Command Syntax

```
pbb-te vlan (add|delete) (range <2-4094> <2-4094>| <2-4094>)
```

```
pbb-te vlan (add|delete) (range <2-4094> <2-4094>| <2-4094>) (bridge <1-32>|)
```

Parameters

add	Add a specific VLAN or a range of VLANs.
delete	Delete a specific VLAN or a range of VLANs.
range	A range of VLAN IDs.
<2-4094>	Start of range of VLAN IDs.
<2-4094>	End of range of VLAN IDs.
<2-4094>	Specific VLAN ID.
bridge	Bridge.
<1-32>	Bridge ID.

Command Mode

Configure mode

Example

```
(config)#pbb-te vlan 20
(config)#pbb-te delete vlan 20
```


show pbb-te

Use this command to display all ESP (Ethernet Switched Path) components that belong to a specific TESI (Traffic Engineering Service Instance) or display summary information for all configured TESIs.

Command Syntax

```
show pbb-te aps-group (APS-ID | all)
show pbb-te (tesid TESID | name TRUNK_NAME | all)
show pbb-te isid aps (APSID | all)
show pbb-te vlans tesid (TESID | all)
```

Parameters

aps-group	APS-group related
APS-ID	Specify the APS ID <1-4095>
all	Specifies all APS IDs
tesid	Display information for a specific TESI ID
TESID	Display APS ID
name	Display a trunk name
TRUNK_NAME	Display APS ID
aps	Display APS ID
APS-ID	Specify the APS-ID <1-4095>
all	Specify all APS-ID
vlans	Display all VLANs belonging to TESIs
TESID	Display a TESI ID <1-42947295>
all	Display a summary of all TESIs

Command Mode

Exec mode and Privileged Exec mode

Example

```
#show pbb-te tesid 10
TESID: 10
cbp interface: cbp.1
ESP Id  SMAC          DMAC          ESP-VID Ingress  Multicast
000     000c.000c.000c  000d.000d.000d  20      No       No
001     000c.000c.000c  000d.000d.000d  10      Yes      No.
```

type

Use this command to set the type of the local CBP (Customer Backbone Port) interface that is associated with this TESI (Traffic Engineering Service Instance).

Use the `no` form of the command to set the type to its default (static). You can specify a parameter for the `no` form, but it is ignored.

Command Syntax

```
type (dynamic|static)
no type (dynamic|static|)
```

Parameters

<code>dynamic</code>	Dynamic TESI.
<code>static</code>	Static TESI.

None

Command Mode

PBB-TE configure mode

Examples

The following is an example of this command.

```
#configure terminal
#(config)#pbb-te configure tesid 3
#(pbb-te-config)#type dynamic
```

CHAPTER 12 PBB-TE CFM Commands

This chapter contains the commands pertaining to the Provider Backbone Bridging — Traffic Engineering (PBB-TE) for Connectivity Fault Management (CFM).

Note: Provider Backbone Bridging is not supported for ZebIC releases.

- [cc multicast](#) on page 308
- [cc unicast](#) on page 309
- [clear ethernet cfm pbb-te errors](#) on page 310
- [clear ethernet cfm pbb-te maintenance-points](#) on page 311
- [clear ethernet cfm pbb-te traceroute-cache](#) on page 312
- [dmm](#) on page 313
- [dvm](#) on page 314
- [ethernet cfm automatic pbb mep](#) on page 315
- [ethernet cfm pbb-te cc domain-name](#) on page 316
- [ethernet cfm pbb-te domain-name](#) on page 317
- [ethernet cfm pbb-te domain-name type](#) on page 318
- [ethernet cfm pbb-te mep](#) on page 320
- [ethernet cfm pbb-te server-ais](#) on page 321
- [ethernet cfm pbb-te traceroute cache](#) on page 322
- [ethernet cfm pbb-te traceroute cache size](#) on page 323
- [mep pbb-te crosscheck](#) on page 324
- [ping ethernet pbb-te](#) on page 325
- [ping ethernet pbb-te mac](#) on page 326
- [ping ethernet pbb-te source-mpid](#) on page 327
- [service pbb-te](#) on page 328
- [show ethernet cfm pbb-te errors](#) on page 329
- [show ethernet cfm pbb-te maintenance points local](#) on page 330
- [show ethernet cfm pbb-te maintenance-points remote](#) on page 331
- [traceroute pbb-te ethernet esp-da-mac](#) on page 332

cc multicast

Use this command to enable multicast continuity checking (CC).

Command Syntax

```
cc multicast state (enable|disable)
```

Parameters

state	Set the continuity check state.
disable	Disable the continuity checking state for multicast.
enable	Enable the continuity checking state for multicast.

Command Mode

Interface Ethernet CFM PBB-TE MEP configuration mode

Example

```
#configure terminal
#interface cbp.1
(config-if)#ethernet cfm pbb-te mep up mpid 2 domain-name ipi te-sid 3 bridge
backbone
(config-if-cfm-pbb-te-mep)#cc multicast enable
```

cc unicast

Use this command to enable or disable unicast continuity checking (CC) between a host MEP and a remote MEP.

Command Syntax

```
cc unicast rmpid RMEPID state (enable | disable)
```

Parameters

rmpid	Remote MEP ID
state	Set the continuity check state.
disable	Disable the continuity checking state for multicast.
enable	Enable the continuity checking state for multicast.

Command Mode

Interface Ethernet CFM PBB-TE MEP configuration mode

Example

```
#configure terminal
#interface cbp.1
(config-if)#ethernet cfm pbb-te mep up mpid 2 domain-name ipi te-sid 3 bridge
backbone
(config-if-cfm-pbb-te-mep)#cc unicast rmpid 12 state enable
```

clear ethernet cfm pbb-te errors

Use this command to clear continuity check errors logged in a domain on a bridge.

Command Syntax

```
clear ethernet cfm pbb-te errors domain-name DOMAIN_NAME bridge backbone
```

Parameters

domain-name Specify a maintenance domain name.

DOMAIN_NAME Specify a maintenance domain name.

Command Mode

Exec Mode and Privileged Exec Mode

Example

```
>clear ethernet cfm pbb-te errors domain-name new bridge backbone
```

clear ethernet cfm pbb-te maintenance-points

Use this command to clear CFM maintenance point information in a remote domain on a bridge.

Command Syntax

```
clear ethernet cfm pbb-te maintenance-points remote domain-name DOMAIN_NAME bridge  
backbone
```

Parameters

domain-name Specify a maintenance domain name.

DOMAIN_NAME Specify a maintenance domain name.

Command Mode

Exec Mode and Privileged Exec Mode

Example

```
>clear ethernet cfm pbb-te maintenance-points remote domain-name new bridge  
backbone
```

clear ethernet cfm pbb-te traceroute-cache

Use this command to clear the traceroute-cache entries on a bridge.

Command Syntax

```
clear ethernet cfm pbb-te traceroute-cache (bridge <1-32> | backbone)
```

Parameter

bridge	Specify a bridge group name.
<1-32>	Specify a bridge ID.
backbone	Identifies the bridge as a backbone.

Command Mode

Exec Mode and Privileged Exec Mode

Example

```
>clear ethernet cfm pbb-te traceroute-cache bridge 1
```

dmm

Use this command to configure two-way delay measurement (DMM) on a MEP.

Command Syntax

```
dmm (unicast (rmpid MEPID) | multicast) duration DURATION ((interval (1 | 2 | 3 | 4)) |)
```

Parameters

unicast	Specify that unicast frames should be sent
rmpid	ID of the remote MEP for unicast frames
multicast	Specify that multicast frames should be sent
duration	Duration for which DMM should be observed in seconds <5-60>
interval	Set the transmission interval:
1	100 milliseconds
2	10 milliseconds
3	1 second
4	10 seconds

Command Mode

Ethernet CFM PBB-TE MEP configuration mode

Examples

```
(config-cfm-pbb-te-mep)#dmm multicast duration 5
```

dvm

Use this command to enable delay-variation measurement (DVM) on a MEP.

Command Syntax

```
dvm (unicast (rmpid MEPID) | multicast) duration DURATION ((interval (1 | 2 | 3 | 4)) |)
```

Parameters

unicast	Specify that unicast frames should be sent
rmpid	ID of the remote MEP for unicast frames
multicast	Specify that multicast frames should be sent
duration	Duration for which DVM should be observed in seconds <5-60>
interval	Set the transmission interval:
1	100 milliseconds
2	10 milliseconds
3	1 second
4	10 seconds

Command Mode

Ethernet CFM PBB-TE MEP configuration mode

Examples

```
(config-cfm-pbb-te-mep)#dvm multicast duration 5
```

ethernet cfm automatic pbb mep

Use this command to go into Ethernet CFM PBB-TE MEP configuration mode where you can configure an automatic MEP.

Command Syntax

```
ethernet cfm automatic pbb mep MEPID bridge (<1-32> | backbone)
```

Parameters

mep	Automatic CFM MEP.
MEPID	Specify the MEP identifier <1-1000>.
bridge	Specify a bridge.
<1-32>	Specify a bridge identifier.
backbone	Backbone bridge.

Command Mode

Configure mode

Example

```
#config terminal
#(config)interface eth1
#(config-if)ethernet cfm automatic pbb mep 10 bridge
#(config-if-cfm-pbb-te-mep)
```

ethernet cfm pbb-te cc domain-name

Use this command to set an interval for CC message transmission for a maintenance domain.

Command Syntax

```
ethernet cfm pbb-te cc domain-name DOMAIN_NAME te-sid TE_SID
interval (1 | 2 | 3 | 4 | 5 | 6 | 7) (mepid MEPID |)bridge backbone
```

Parameters

domain-name	Specify the maintenance domain name.
DOMAIN_NAME	Specify the maintenance domain name.
te-sid	Specify the TE service instance.
TE_SID	Specify the TE service instance ID <1-42949675>.
interval	Interval at which CC messages should be sent:
1	Set the CCI interval to 3 milliseconds
2	Set the CCI interval to 10 milliseconds
3	Set the CCI interval to 100 milliseconds
4	Set the CCI interval to 1 second
5	Set the CCI interval to 10 seconds
6	Set the CCI interval to 1 minute
7	Set the CCI interval to 10 minutes
mepid	Host MEP.
MEPID	Specify the host MEP ID.

Command Mode

Configure mode

Example

```
#configure terminal
(config)#ethernet cfm pbb-te cc domain-name ne te-sid 1 interval 1 mepid 1
bridge backbone
```

ethernet cfm pbb-te domain-name

Use this command to create a PBB-TE domain for a backbone bridge.

Command Syntax

```
ethernet cfm pbb-te domain-name DOMAIN_NAME te-sid TE_SID aps switching-time
interval (1 | 2 | 3 | 4 | 5 |6) bridge backbone
```

Parameters

TE_SID	Enter the TES ID <1-42949675>
interval	Specify a time interval:
1	APS Switching Interval 1 second
2	APS Switching Interval 2 seconds
3	APS Switching Interval 3 seconds
4	APS Switching Interval 4 seconds
5	APS Switching Interval 5 seconds
6	APS switching interval in 50msec

Command Mode

Configure mode

Examples

```
#configure terminal
(config)#ethernet cfm pbb-te domain-name new te-sid 12 aps switching-time
interval 1 bridge backbone
```

ethernet cfm pbb-te domain-name type

Use these commands to create and configure a domain.

Use the `no` form of this command to remove a domain.

Command Syntax

```
ethernet cfm pbb-te domain-name type ((no-name name NO_NAME) | (dns-based name
DOMAIN_NAME) | (character-string name DOMAIN_NAME) | mac name DOMAIN_NAME)
level LEVEL mip-creation (none|default|explicit) bridge backbone

ethernet cfm pbb-te domain-name type ((no-name name NO_NAME) | (dns-based name
DOMAIN_NAME) | (character-string name DOMAIN_NAME) | mac name DOMAIN_NAME) level
LEVEL mip-creation (none|default|explicit) bridge <1-32>

ethernet cfm pbb-te domain-name type itu-t name DOMAIN_NAME level LEVEL mip-
creation (none|default|explicit) bridge backbone

no ethernet cfm pbb-te domain DOMAIN_NAME level LEVEL
mip-creation (none|default|explicit) bridge backbone

no ethernet cfm pbb-te domain DOMAIN_NAME level LEVEL
mip-creation (none|default|explicit) bridge <1-32>
```

Parameters

<code>type</code>	Specify the name type.
<code>no-name name</code>	
	Specify the name type has no maintenance domain name.
<code>NO_NAME</code>	Enter the name.
<code>dns-based name</code>	
	Specify the name as domain-name based.
<code>DOMAIN_NAME</code>	Enter the domain name
<code>character-string name</code>	
	Specify the name as a character string.
<code>DOMAIN_NAME</code>	Enter the domain name
<code>mac name</code>	Specify the name as MAC address + 2-octet integer.
<code>DOMAIN_NAME</code>	Enter the domain name
<code>itut-t name</code>	Specify the name in ITU-T carrier code (ICC) format.
<code>DOMAIN_NAME</code>	Enter the domain name
<code>level</code>	Level.
<code>LEVEL</code>	Enter the level <0-7>.
<code>mip-creation</code>	Specify a MIP creation permission value.

none	Specify that no MIP may be created for the VID.
default	MIP can be created if no lower active level or MEP at next lower active level.
explicit	MEP is needed at the next lower active level
bridge backbone	
	Backbone bridge.
bridge	Bridge.
<1-32>	Bridge ID.

Command Mode

Configure mode

Example

```
(config)#ethernet cfm pbb-te domain-name type character-string name ipi level 3  
mip-creation default bridge backbone
```

ethernet cfm pbb-te mep

Use this command to create a MEP on a PBB-TE and set it to the up or down state. This command switches you into Ethernet CFM PBB-TE MEP configuration mode.

Use the `no` form of this command to delete a MEP.

Command Syntax

```
ethernet cfm pbb-te mep (down|up) mpid MEPID domain-name DOMAIN_NAME te-sid TESID  
bridge backbone
```

```
no ethernet cfm pbb-te mep (down|up) mpid MEPID domain-name DOMAIN_NAME  
te-sid TE_SID bridge backbone
```

Parameters

down	Set the MEP's direction of flow to down.
up	Set the MEP's direction of flow to up.
mpid	Source MEP.
MEPID	Source MEP identifier.
domain-name	Maintenance domain.
DOMAIN_NAME	The name of the maintenance domain.
te-sid	Identifies a traffic engineering service instance.
TE_SID	Traffic engineering service instance identifier <1-42949675>.

Command Mode

Interface mode

Examples

```
#configure terminal  
#interface cbp.1  
(config-if)#ethernet cfm pbb-te mep up mpid 2 domain-name ipi te-sid 3 bridge  
backbone  
(config-if-cfm-pbb-te-mep)#
```

ethernet cfm pbb-te server-ais

Use this command to configure a MEP server for AIS.

Command Syntax

```
ethernet cfm pbb-te server-ais status (enable|disable) level LEVEL  
(interval TX_INTERVAL|) bridge backbone
```

Parameters

status	Set the status of a MEP server
disable	Set to disable a MEP server for AIS
enable	Set to enable MEP server for AIS
level	The level at which AIS frames are to be sent.
LEVEL	Set the level at which AIS frames are to be sent <1-7>.
interval	The transmission interval for AIS frames.
TX_INTERVAL	Set a transmission interval for AIS frames <1-10>.

Command Mode

Interface mode

Examples

```
(config)#interface eth1  
(config-if)#ethernet cfm pbb-te server-ais status disable level 1 interval 1  
bridge backbone  
(config-if)#ethernet cfm pbb-te server-ais status enable level 1 bridge  
backbone
```

ethernet cfm pbb-te traceroute cache

Use this command to enable traceroute cache for a backbone bridge.

Use the `no` form of this command to disable the traceroute cache.

Command Syntax

```
ethernet cfm pbb-te traceroute cache bridge backbone
no ethernet cfm pbb-te traceroute cache bridge backbone
```

Parameters

None

Command Mode

Configure mode

Examples

```
#configure terminal
(config)#ethernet cfm pbb-te traceroute cache bridge backbone
(config)#no ethernet cfm pbb-te traceroute cache bridge backbone
```

ethernet cfm pbb-te traceroute cache size

Use this command to set the traceroute cache size for a backbone bridge.

Use the `no` form of this command to reset the traceroute cache to its default size (100).

Command Syntax

```
ethernet cfm pbb-te traceroute cache size ENTRIES bridge backbone
no ethernet cfm pbb-te traceroute cache size bridge backbone
```

Parameters

<code>size</code>	The size of cache desired
<code>ENTRIES</code>	The size of cache desired

Command Mode

Configure mode

Examples

```
#configure terminal
(config)#ethernet cfm pbb-te traceroute cache size 29 bridge backbone
(config)#no ethernet cfm pbb-te traceroute cache size bridge backbone
```

mep pbb-te crosscheck

Use this command to configure a remote MEP (Maintenance End Point).

Use the `no` form of the command to remove a MAC address from a remote CBP (Customer Backbone Port).

Command Syntax

```
mep pbb-te crosscheck mpid MEPID te-sid TE_SID (mac MAC|)
no mep pbb-te crosscheck mpid MEPID te-sid TE_SID (mac MAC|)
```

Parameters

<code>mpid</code>	Remote MEP.
<code>MEPID</code>	Configure remote MEP ID <1-8191>.
<code>te-sid</code>	Associate to TE-SID.
<code>TE_SID</code>	TE-SID <1-42949675>.
<code>mac</code>	Configure the remote MAC.
<code>MAC</code>	Remote MAC address in HHHH.HHHH.HHHH format.

Command Mode

Ethernet CFM PBB-TE mode

Examples

```
#configure terminal
(config)#ethernet cfm pbb-te domain-name type character-string name abc level
3 mip-creation default bridge backbone
(config-ether-cfm-pbb-te)#mep pbb-te crosscheck mpid 60 te-sid 20 mac
05.1111.1212
```

ping ethernet pbb-te

Use this command to configure multicast or unicast Loop Back Messaging (LBM) between a PBB-TE MEP in a TE-SID and the reverse VID that should to be sent in the PBB-TE MIP TLV.

Command Syntax

```
ping ethernet pbb-te (multicast (recursive|) | unicast rmepid RMEPID)
  mepid MEPID domain-name DOMAIN_NAME te-sid TE_SID
  (tlv ( data VAL | test (1 | 2 | 3 |4))) bridge backbone
```

Parameters

multicast	Send multicast frames.
recursive	Send recursive multicast frames (5 frames).
unicast	Send recursive multicast frames (5 frames).
rmepid	Remote MEP.
RMEPID	Remote MEP ID.
mepid	Source MEP.
MEPID	Source MEP ID.
domain-name	The name of the maintenance domain.
DOMAIN_NAME	The name of the maintenance domain.
te-sid	Identifies a traffic engineering service instance.
TE_SID	Traffic engineering service instance ID <1-42949675>.
tlv	Type, length, value.
data	TLV data.
VAL	Data value.
test	TVL type:
1	Test pattern: abc.
2	Test pattern: 1234.
3	Test pattern: a1b2c.
4	Test pattern: 1a2b3c.

Command Mode

Exec mode

Examples

```
#ping ethernet pbb-te multicast mepid 5 domain-name ipi te-sid 3 bridge
backbone
#ping ethernet pbb-te unicast rmepid 4 mepid 5 domain-name ipi te-sid 3 bridge
backbone
```

ping ethernet pbb-te mac

Use this command to send a unicast loopback packet between a source MEP and a remote MEP.

Command Syntax

```
ping ethernet pbb-te mac MACADDRESS unicast source MEPID domain DOMAIN_NAME
te-sid TE_SID (tlv ((pbb-te-mip reverse-vid VLAN_VID) |
data VAL |test (1 | 2 | 3 |4))) bridge backbone
```

Parameters

mac	Remote MAC address.
MACADDRESS	Remote MAC address in HHHH.HHHH.HHHH format.
source	Source MEP.
MEPID	An integer that identifies the source MEP.
domain-name	The name of the maintenance domain.
DOMAIN_NAME	The name of the maintenance domain.
te-sid	Identifies a traffic engineering service instance.
TE_SID	Traffic engineering service instance ID <1-42949675>.
tlv	Type, length, value.
pbb-te-mip reverse-vid	PBB-TE-MIP TLV.
VLAN_VID	Reverse VLAN ID for the TE-MIP.
data	TLV data.
VAL	Data value.
test	TVL type:
1	Test pattern: abc.
2	Test pattern: 1234.
3	Test pattern: a1b2c.
4	Test pattern: 1a2b3c.

Command Mode

Exec mode

Example

```
#ping ethernet pbb-te mac 003f.0003.003b unicast source 5 domain-name ipi te-
sid 3 tlv pbb-te-mip reverse-vid 10 bridge backbone
```

ping ethernet pbb-te source-mpid

Use this command to configure LBM from a source MEP to a remote MEP in a domain with the same TE-SID when test data values cannot be sent in response.

Command Syntax

```
ping ethernet pbb-te source-mpid SOURCE_MEPID (multicast | rmep-id RMEP_ID)
domain-name DOMAIN_NAME te-sid TE_SID bridge backbone
```

Parameters

mepid	Source MEP.
SOURCE_MEPID	Source MEP ID.
multicast	Send multicast frames.
rmepid	Send unicast frames to remote MEP.
RMEPID	Remote MEP ID.
domain-name	The name of the maintenance domain.
DOMAIN_NAME	The name of the maintenance domain.
te-sid	Identifies a traffic engineering service instance.
TE_SID	Traffic engineering service instance ID <1-42949675>.

Command Mode

Exec mode

Example:

```
#ping ethernet pbb-te mpid source-mpid 5 rmep-id 3 domain-name ipi te-sid 2
bridge backbone
```

service pbb-te

Use this command to create a maintenance association (MA) for a PBB TE service instance.

Use the `no` form of the command to delete the MA from the PBB TE service instance.

Command Syntax

```
service pbb-te ma-type (primary-vid | string | integer | vpn-id) ma-name MA_NAME
    te-sid TESID mip-creation (none|default|explicit|defer)
no service pbb-te CSI_ID te-sid TE_SID mip-creation (none|default|explicit|defer)
```

Parameters

ma-type	Type of maintenance association name:
primary-vid	Primary VID.
string	Character string.
integer	Integer.
vpn-id	VPN ID.
ma-name	Maintenance association name.
MA_NAME	Maintenance association name.
te-sid	Identifies a traffic engineering service instance.
TESID	Traffic engineering service instance ID <1-42949675>.
mip-creation	Specify a MIP creation permission value.
none	Specify that no MIP may be created for the VID.
default	Specify that a MIP can be created for a VID on the bridge.
explicit	Specify that a MIP can be created for the VID only on ports which the VID can pass.
defer	In the MA only, control of MHF creation is deferred to the corresponding variable in the enclosing MD
CSI_ID	Maintenance association name.

Command Mode

Ethernet CFM PBB-TE mode

Examples

```
(config)#ethernet cfm pbb-te domain ipi level 2 bridge backbone
(config-ether-cfm-pbb-te)#service pbb-te mal te-sid 1 mip-creation default
```

show ethernet cfm pbb-te errors

Use this command to display errors in the PBB-TE domain for a backbone bridge.

Command Syntax

```
show ethernet cfm pbb-te errors domain-name DOMAIN_NAME bridge backbone
```

Parameters

domain-name The name of the maintenance domain.

DOMAIN_NAME The name of the maintenance domain.

Command Mode

Exec mode

Examples

```
#show ethernet cfm pbb-te errors domain-name ipi bridge backbone
```

show ethernet cfm pbb-te maintenance points local

Use this command to display the status of all MEPs or MIPs in a PBB-TE domain on a backbone bridge.

Command Syntax

```
show ethernet cfm pbb-te maintenance-points local (mep|mip)
(interface IFNAME|domain-name DOMAIN_NAME) bridge backbone
```

Parameters

mep	Display MEP (Maintenance End Points) statistics.
mip	Display MIP (Maintenance Intermediate Points) statistics.
interface	Display the interface name.
IFNAME	The name of the interface.
domain-name	The name of the maintenance domain.
DOMAIN_NAME	The name of the maintenance domain.

Command Mode

Exec mode

Examples

```
#show ethernet cfm pbb-te maintenance-points local mep interface cbp1.backbone
domain-name ipi bridge backbone
```

show ethernet cfm pbb-te maintenance-points remote

Use this command to display status of all remote MEPs or MIPs in a PBB-TE domain.

Command Syntax

```
show ethernet cfm pbb-te maintenance-points remote (mpid MEP_ID| mac MAC_ADDRESS|)
domain-name DOMAIN_NAME te-sid TE_SID bridge backbone
```

Parameters

mpid	Remote MEP.
MEP_ID	Remote MEP ID.
mac	MAC address of the remote MEP.
MAC_ADDRESS	Enter the remote MEP MAC address in HHHH.HHHH.HHHH format
domain-name	The name of the maintenance domain.
DOMAIN_NAME	The name of the maintenance domain.
te-sid	Identifies a traffic engineering service instance.
TE_SID	Traffic engineering service instance ID <1-42949675>.

Command Mode

Exec mode

Example

```
#show ethernet cfm pbb-te maintenance-points remote mpid 10 domain-name ipi
te-sid 3 bridge backbone
```

traceroute pbb-te ethernet esp-da-mac

Use this command to configure linktrace messaging on a PBB-TE MEP in the TESI (Traffic Engineering Service Instance).

Command Syntax

```
traceroute pbb-te ethernet esp-da-mac ESP_DA_MAC domain-name DOMAIN_NAME  
te-sid TE_SID tlv pbb-te-mip reverse-vid REVERSE_VLANID bridge backbone
```

Parameters

esp-da-mac	MAC address of the Ethernet Switched Path (ESP)
ESP_DA_MAC	MAC address of the ESP.
domain-name	The name of the maintenance domain.
DOMAIN_NAME	The name of the maintenance domain.
te-sid	Identifies a traffic engineering service instance.
TE_SID	Traffic engineering service instance ID <1-42949675>.
reverse-vid	Reverse VLAN ID to send in the PBB-TE MIP TLV field
REVERSE_VLANID	Reverse VLAN ID for the TE-MIP.

Command Mode

Exec mode

Example

```
#traceroute pbb-te ethernet 222.222.22e domain-name ipi te-sid 3 tlv pbb-te-  
mip reverse-vid 4 bridge backbone
```

CHAPTER 13 PBB-TE Measurement Commands

The commands in this section are used to configure various frame measurement processes for tracking incidents in a PBB-TE domain.

Note: Provider Backbone Bridging is not supported for ZebIC releases.

This chapter includes the following commands:

- [1dm](#) on page 334
- [1dm receive](#) on page 335
- [ais interval](#) on page 336
- [ais status](#) on page 337
- [exm tx](#) on page 338
- [in-service](#) on page 339
- [lmm](#) on page 340
- [mcc tx](#) on page 341
- [out-of-service](#) on page 342
- [show ethernet cfm pbb-te ais reception-status](#) on page 343
- [throughput-measurement reception](#) on page 344
- [throughput-measurement unicast](#) on page 345
- [tst](#) on page 346
- [vsm tx](#) on page 347

1dm

Use this command to configure one-way delay measurement (1DM) on a MEP.

Command Syntax

```
1dm (unicast (rmpid MEPID) | multicast) duration DURATION ((interval (1 | 2 | 3 | 4)) |)
```

Parameters

unicast	Specify that unicast frames should be sent
rmpid	ID of the remote MEP for unicast frames
multicast	Specify that multicast frames should be sent
duration	Duration for which 1DM should be observed in seconds <5-60>
interval	Set the transmission interval:
1	100 milliseconds
2	10 milliseconds
3	1 second
4	10 seconds

Command Mode

Ethernet CFM PBB-TE MEP configuration mode

Examples

```
(config-cfm-pbb-te-mep)#1dm multicast duration 5
```

1dm receive

Use this command to configure reception of one-way delay measurement (1DM) frames for a MEP.

Command Syntax

```
1dm receive duration DURATION
```

Parameters

<code>duration</code>	Duration for which 1DM should be observed in seconds <5-60>
-----------------------	---

Command Mode

Ethernet CFM PBB-TE MEP configuration mode

Examples

```
(config-cfm-pbb-te-mep)#1dm receive duration 10
```

ais interval

Use this command to set the AIS transmission interval.

Command Syntax

```
ais interval TX_INTERVAL
```

Parameters

TX_INTERVAL Enter a transmission interval in seconds <1-60>.

Command Mode

Ethernet CFM PBB-TE MEP configuration mode

Example

```
(config-cfm-pbb-te-mep)#ais interval 1
```

ais status

Use this command to enable or disable AIS frame transmission for a MEP. AIS frames are triggered by Ethernet down events.

An internal counter is maintained for each AIS instance that is running. The maximum number of instances supported is eight.

Command Syntax

```
ais status (enable | disable) (unicast RMEP_MAC | multicast) level <0-7>
```

Parameters

enable	Enable AIS frame monitoring
disable	Disable AIS frame monitoring
unicast	Specify the unicast ais frame to be sent
RMEP_MAC	Specify a remote MEP MAC address in the format HHHH.HHHH.HHHH.
multicast	Specify the multicast ais frame to be sent
level	Specify the level for AIS transmission.

Command Mode

Ethernet CFM PBB-TE MEP configuration mode

ExampleS

This example enables AIS 5 for unicast frames at the specified MAC address at level 3:

```
(config-cfm-pbb-te-mep)#ais status enable level 1 unicast 2222.1111.432a
```

exm tx

Use this command to configure Ethernet experimental OAM messaging (EXM) functionality between a host and a destination MEP.

Command Syntax

```
exm tx unicast rmepid RMEPID
```

Parameters

<code>rmepid</code>	Specify the ID of the remote MEP.
---------------------	-----------------------------------

Command Mode

Ethernet CFM PBB-TE MEP configuration mode

Example

```
(config-cfm-pbb-te-mep)#exm tx unicast rmepid 12
```

in-service

Use this command to configure a TESI for in-service testing.

Command Syntax

```
in-service testing
```

Parameters

None

Command Mode

Ethernet CFM PBB-TE MEP configuration mode

Example

```
(config-cfm-pbb-te-mep)#in-service testing
```

Imm

Use this command to configure Loss Measurement Messaging (LMM) for a MEP.

Command Syntax

```
lmm (unicast rmepid RMEPID | multicast) duration <5-60> (interval (1 | 2 | 3 | 4) |)
```

Parameters

unicast	Specify that unicast frames should be sent
rmepid	ID of the remote MEP for unicast frames
multicast	Specify that multicast frames should be sent
duration	Duration for which LMM should be observed in the range of <5-60> seconds
interval	Set the transmission interval:
1	100 milliseconds
2	10 milliseconds
3	1 second
4	10 seconds

Command Mode

Ethernet CFM PBB-TE MEP configuration mode

Examples

```
(config-cfm-pbb-te-mep)#lmm unicast rmepid 3 duration 10 interval 1
```

mcc tx

Use this command to configure multicast or unicast Maintenance Communication Channel (MCC) frames.

Command Syntax

```
mcc tx (unicast rmepid RMEPID| multicast)
```

Parameters

unicast	Specify that unicast MCC frame are to be sent
rmepid	Specify the ID of the remote MEP.
multicast	Specify that multicast MCC frame are to be sent

Command Mode

Ethernet CFM PBB-TE MEP configuration mode

Example

```
(config-cfm-pbb-te-mep)#mcc tx unicast rmepid 12
```

out-of-service

Use this command to configure a TESI for out-of-service testing.

Command Syntax

```
out-of-service lck-level <0-7> testing
```

Parameters

lck-level	Level at which LCK frames are to be generated
<0-7>	Enter the LCK level

Command Mode

Ethernet CFM PBB-TE MEP configuration mode

Example

```
(config-cfm-pbb-te-mep)#out-of-service lck-level 4 testing
```

show ethernet cfm pbb-te ais reception-status

Use this command to display the status of AIS frame reception.

Command Syntax

```
show ethernet cfm pbb-te ais reception-status mep MEPID domain-name DOMAIN_NAME  
te-sid TE_SID bridge backbone
```

Parameters

mep	Host MEP.
MEPID	Host MEP ID.
domain-name	The name of the maintenance domain.
DOMAIN_NAME	The name of the maintenance domain.
te-sid	Identifies a traffic engineering service instance.
TE_SID	Traffic engineering service instance ID <1-42949675>.

Command Mode

Exec mode

Example

```
#show ethernet cfm pbb-te ais reception-status mep 4 domain-name ipi te-sid 4  
bridge backbone
```

throughput-measurement reception

Use this command to enable throughput-measurement reception for an MD and an MA.

Command Syntax

```
throughput-measurement reception duration <1-10>
```

Parameters

<code>duration</code>	Maximum duration of wait time for test (TST) frames before timing out <1-10>.
-----------------------	---

Command Mode

Ethernet CFM PBB-TE MEP configuration mode

Example

```
(config-cfm-pbb-te-mep)#throughput-measurement reception duration 1
```

throughput-measurement unicast

Use this command to configure throughput measurement frames from a MEP.

Throughput is defined as the maximum rate of frame transmission at which no frame is dropped. Throughput can be measured by sending frames at an increasing rate (up to a theoretical maximum), graphing the percentage of frames received, and reporting the rate at which frames start being dropped. The rate is dependent on the frame size. Unicast Ethernet loopback (ETH-LB) or Ethernet Test (ETH-TST) frames, with the data field, can be used for throughput measurements.

Command Syntax

```
throughput-measurement unicast rmepid RMEPID
```

Parameters

<code>rmepid</code>	Remote MEP ID
---------------------	---------------

Command Mode

Ethernet CFM PBB-TE MEP configuration mode

Example

```
(config-cfm-pbb-te-mep)#throughput-measurement unicast rmepid 20
```

tst

Use this command to send a unicast or multicast test (TST) frame with a selected pattern. When the `recursive` option is chosen, periodic test frames are sent. Otherwise, only a single test frame is sent. A test frame alone or a TST and lock (LCK) frame can be sent.

Command Syntax

```
tst (unicast RMEPID | multicast) pattern (1 | 2 | 3 | 4) (recursive duration <5-60>
interval TX_INTERVAL|) (lck interval TX_INTERVAL (unicast rmepid RMEPID |
multicast)|)
```

Parameters

unicast	Send unicast or multicast test frame
rmepid	Identity of the remote MEP.
multicast	Send unicast or multicast test frame
pattern	Test pattern to send:
1	Test Pattern: abc.
2	Test Pattern:1234.
3	Test Pattern: a1b2c.
4	Test Pattern: 1a2b3c.
recursive	Recursively send TST frames.
duration	Number of seconds to send test frames.
interval	The transmission interval value for test frames in seconds <1-10>. If no range is specified, 1 second is set as the default.
lck	Send lock (LCK) frame in the opposite direction for out-of-service testing
interval	The transmission interval value for test frames in seconds <1-10>. If no range is specified, 1 second is set as the default. This should be the same as the AIS transmission interval.
unicast	Send unicast LCK frame
rmepid	Remote MEP ID
multicast	Send multicast LCK frame

Command Mode

Ethernet CFM PBB-TE MEP configuration mode

Examples

```
(config-cfm-pbb-te-mep)#tst multicast pattern 1
```

```
(config-cfm-pbb-te-mep)#tst multicast pattern 1 lck interval 1 unicast rmepid 1
```

```
(config-cfm-pbb-te-mep)#tst multicast pattern 1 recursive duration 5 interval 1 lck interval 1 unicast rmepid 12
```

vsm tx

Use this command to configure vendor-specific (VSM) OAM functionality between a host and a destination MEP.

Command Syntax

```
vsm tx unicast rmepid RMEPID
```

Parameters

<code>rmepid</code>	Specify the ID of the remote MEP.
---------------------	-----------------------------------

Command Mode

Ethernet CFM PBB-TE MEP configuration mode

Example

```
(config-cfm-pbb-te-mep)#vsm tx unicast rmepid 3
```


CHAPTER 14 PBB-TE APS Commands

This chapter contains the commands for Provider Backbone Bridging — Traffic Engineering (PBB-TE) for Automatic Protection Switching (APS).

Note: Provider Backbone Bridging is not supported for ZebIC releases.

- [ethernet cfm pbb-te aps switching-time](#)
- [exit-pbb-te-switching-mode](#)
- [pbb-te aps-group](#)
- [pbb-te aps-group isid](#)
- [pbb-te configure switching cbp](#)
- [pbb-te timer](#)
- [show pbb-te aps-group](#)

ethernet cfm pbb-te aps switching-time

Use this command to set the APS switching time interval for a domain.

Command Syntax

```
ethernet cfm pbb-te domain-name DOMAIN_NAME te-sid TE_SID aps switching-time
interval (1 | 2 | 3 | 4 | 5 |6) bridge backbone
```

Parameters

domain-name	Specify the maintenance domain name.
DOMAIN_NAME	Specify the maintenance domain name.
te-sid	Specify the TE service instance.
TE_SID	Specify the TE service instance ID <1-42949675>.
interval	Specify a time interval:
1	APS switching interval 1 second
2	APS switching interval 2 seconds
3	APS switching interval 3 seconds
4	APS switching interval 4 seconds
5	APS switching interval 5 seconds
6	APS switching interval in 50 milliseconds

Command Mode

Configure mode

Examples

```
#configure terminal
(config)#ethernet cfm pbb-te domain-name new te-sid 12 aps switching-time
interval 1 bridge backbone
```

exit-pbb-te-switching-mode

Use this command to exit PBB-TE configure switching mode

Command Syntax

```
exit-pbb-te-switching-mode
```

Parameters

None

Command Mode

PBB-TE configure switching mode

Examples

```
(pbb-te-config-switching) #exit-pbb-te-switching-mode  
(config-if) #
```

pbb-te aps-group

Use this command to create or delete a PBB-TE protection group with an Automatic Protection Switching (APS) ID. If the named APS ID does not already exist, it is created and associated with a working and a protection Traffic Engineering Service Instance (TESI). Once created, TESI protection group members cannot be changed. Rather, the APS group must be deleted and then re-created with new TESI member associations.

Use the `no` form of this command to remove an APS protection group.

Command Syntax

```
pbb-te aps-group APSID working-tesi TESID protection-tesi TESID
no pbb-te aps-group APSID
```

Parameters

<code>aps-group</code>	Automatic protection group
<code>APS-ID</code>	Automatic protection group ID <1-4094>. The APS group ID must to be unique per IB-BEB.
<code>working-tesi</code>	Specify the service instance ID.
<code>TESID</code>	Specify the service instance ID <1-42949675>.

Command Mode

Configure mode

Examples

```
#configure terminal
(config)#pbb-te aps-group 1 cbp cbp001 working-tesi 1 protection-tesi 2
(config)#no pbb-te aps-group 1
```

pbb-te aps-group isid

Use this command to add or delete an service instance ID (ISID) association to or from an APS group. When the APS group engages in protection switching actions, only associated ISID service instances are affected by the APS group's switching actions.

Command Syntax

```
pbb-te aps-group APSID isid (add |delete) ISID
```

Parameters

aps-group	Automatic protection group
APS-ID	Automatic protection group ID <1-4094>
add	Add a service instance
delete	Delete a service instance
ISID	Specify the Ethernet service instance ID <1-16777214>.

Command Mode

Configure mode

Examples

```
#configure terminal
(config)#pbb-te aps-group 1 isid add 1
(config)#pbb-te aps-group 1 isid delete 1
```

pbb-te configure switching cbp

Use this command to enter PBB-TE configure switching mode to set up protection switching for a CBP in an APS group.

Command Syntax

```
pbb-te configure switching cbp IFNAME aps-group APS-ID
```

Parameters

cbp	Identifies the CBP port interface
IFNAME	Identifies the CBP port interface name
aps-group	Automatic protection group
APS-ID	Automatic protection group ID <1-4094>

Command Mode

Interface mode

Example

```
#configure terminal
(config)#interface eth2
(config-if)#pbb-te configure switching cbp cbp1 aps-group 1
(pbb-te-config-switching)
```

pbb-te timer

Use this command to set the protection switching timers for an APS group.

Use the `no` form of the command to return the wait-to-restore or hold-off timer to its default value.

Command Syntax

```
pbb-te timer (wait-to-restore | hold-off) TIME-VALUE
no pbb-te timer (wait-to-restore | hold-off)
```

Parameters

<code>hold-off</code>	Set the hold-off timer <0-10>
<code>wait-to-restore</code>	Set the wait-to-restore timer <300-720>
<code>TIME-VALUE</code>	Set the value of the timer in seconds

Command Mode

PBB-TE configure switching mode

Examples

```
#configure terminal
(config)#pbb-te configure switching cbp cbpl aps-id 1
(pbb-te-config-switching)#pbb-te timer wait-to-restore 300
```

show pbb-te aps-group

Use this command to display protection group details for a specific APS group or to display a summary for all APS groups configured.

Command Syntax

```
show pbb-te aps-group (APS-ID | all)
```

Parameters

aps-group	APS group ID <1-4094>
APS-ID	APS group ID <1-4094>
all	Display all APS group information

Command Mode

Exec mode

Example

```
#show pbb-te aps-group 1
```

CHAPTER 15 PBB-TE Force Commands

This chapter contains the commands for Provider Backbone Bridging — Traffic Engineering (PBB-TE) for Force.

These commands perform functions similar to SONET force and manual switch functions. There are times when it is desirable to voluntarily switch traffic between the EPS working and protection path, such as when performing maintenance on a working interface. Three commands for switching between EPS paths are provided and differentiated by the level of priority for the switch.

Note: Provider Backbone Bridging is not supported for ZebIC releases.

- [pbb-te force-to-protection](#)
- [pbb-te lock-protection](#)
- [pbb-te lock-tesi](#)
- [pbb-te manual-to-protection](#)
- [pbb-te manual-to-working](#)

pbb-te force-to-protection

Use this command to force a switch when a protection interface lockout condition is not in affect.

The `no` form of this command clears the `force` state and returns traffic to the working path.

Command Syntax

```
pbb-te force-to-protection
no pbb-te force-to-protection
```

Parameters

None

Command Mode

PBB-TE configure switching mode

Example

```
#configure terminal
(config)#pbb-te configure switching cbp cbp1 eps-group 1
(pbb-te-config-switching)#pbb-te force-to-protection
(pbb-te-config-switching)#no pbb-te force-to-protection
```

pbb-te lock-protection

Use the lock command to disable use of the protection TESI.

Use the `no` form of the command to return the protection TESI to its previous state.

Command Syntax

```
pbb-te lock-protection
no pbb-te lock-protection
```

Parameters

None

Command Mode

PBB-TE Configure switching mode

Example

```
#configure terminal
(config)#pbb-te configure switching cbp cbp1 eps-group 1
(pbb-te-config-switching)#pbb-te lock-protection
(pbb-te-config-switching)#no pbb-te lock-protection
```

pbb-te lock-tesi

Use this command to lock down (remove traffic) from a TESI on a CBP port. The command searches through the protection groups on the CBP and removes traffic from the TESI.

Use the `no` form of the command to restore traffic to the TESI on the CBP port.

Command Syntax

```
pbb-te lock-tesi TESID cbp IFNAME
no pbb-te lock-tesi TESID cbp IFNAME
```

Parameters

<code>lock-tesi</code>	TE service instance
<code>TESID</code>	ID of the TE service instance
<code>cbp</code>	Interface of the CBP
<code>IFNAME</code>	Interface name

Command mode:

Configure mode

Example

```
#configure terminal
(config)#pbb-te lock-tesi 1 cbp cbp1
```

pbb-te manual-to-protection

Use this command to execute a manual switch to protection when there is a failure on the working TESI and a protection TESI does not exist.

Use the `no` form of the command to return the working and protection TESI to their original states.

Command Syntax

```
pbb-te manual-to-protection
no pbb-te manual-to-protection
```

Parameters

None

Command Mode

PBB-TE Configure switching mode

Example

```
#configure terminal
(config)#pbb-te configure switching cbp cbp1 eps-group 1
(pbb-te-config-switching)#pbb-te manual-to-protection
(pbb-te-config-switching)#no pbb-te manual-to-protection
```

pbb-te manual-to-working

Use this command to switch to the working path.

Use the `no` form of the command to return the TESI to its original state.

Command Syntax

```
pbb-te manual-to-working  
no pbb-te manual-to-working
```

Parameters

None

Command Mode

PBB-TE Configure switching mode

Example

```
#configure terminal  
(config)#pbb-te configure switching cbp cbp1 eps-group 1  
(pbb-te-config-switching)#pbb-te manual-to-working  
(pbb-te-config-switching)#no pbb-te manual-to-working
```

CHAPTER 16 Ethernet Protection Switching Commands

The commands in this chapter apply to Ethernet Protection Switching (EPS).

Note: Provider Backbone Bridging is not supported for ZebIC releases.

- [bridge g8031 eps-id](#)
- [g8031 configure switching](#)
- [g8031 configure vlan](#)
- [g8031 ethernet](#)
- [g8031 exercise](#)
- [g8031 force](#)
- [g8031 local-freeze](#)
- [g8031 local-lockout](#)
- [g8031 lockout](#)
- [g8031 manual](#)
- [g8031 mode](#)
- [g8031 set-nr](#)
- [g8031 timer](#)
- [g8031 vlan](#)
- [show bridge eps-id](#)
- [show bridge g8031](#)

bridge g8031 eps-id

Use this command to create an Ethernet Protection Switching (EPS) link set. I

Each link set is bound to a working and a protection port. Once working and protection ports have been created, they cannot be changed. To change working and protection ports, delete the EPS link set and then recreate it.

Use the `no` form of this command to delete the protection link set.

Command Syntax

```
bridge <1-32> g8031 eps-id EPS-ID working-port IFNAME protection-port IFNAME
(instance <1-63> | )

bridge backbone g8031 eps-id EPS-ID working-port IFNAME protection-port IFNAME
(instance <1-63> |)

bridge (<1-32> | backbone) g8031 eps-id EPS-ID working-port IFNAME protection-port
IFNAME (instance <1-63> |)

no bridge <1-32> g8031 eps-id EPS-ID

no bridge backbone g8031 eps-id EPS-ID

no bridge (<1-32> | backbone) g8031 eps-id EPS-ID
```

Parameters

bridge	Bridge.
<1-32>	Bridge ID.
backbone	Backbone bridge.
eps-id	EPS link set.
EPS-ID	EPS link set ID <1-4094>.
working-port	The interface for the working EPS path.
IFNAME	The interface name of the working port.
protection-port	The interface for the protection EPS path.
IFNAME	The interface name of the protection port.
instance	Protection group instance.
<1-63>	Protection group instance ID.

Command Mode

Configure mode

Examples

```
#configure terminal
(config)#bridge 1 g8031 eps-id 1 working-port eth0 protection-port eth1
instance 1
(config)#no bridge 1 g8031 eps-id 1
```

g8031 configure switching

Use this command to enter G8031 configure switching mode and to set the ID for an Ethernet Protection Switching (EPS) link set.

Note: Provider Backbone Bridging is not supported for ZebIC releases.

Command Syntax

```
g8031 configure switching eps-id EPS_ID bridge <1-32>
g8031 configure switching eps-id EPS_ID bridge backbone
g8031 configure switching eps-id EPS_ID bridge (<1-32> | backbone)
```

Parameters

eps-id	EPS link set.
EPS-ID	EPS link set ID <1-4094>.
bridge	Bridge.
<1-32>	Bridge ID.
backbone	Backbone bridge.

Command Mode

Configure mode

Examples

```
#configure terminal
(config)#g8031 configure switching eps-id 10 bridge backbone
(g8031-config-switching)#

(config)#g8031 configure switching eps-id 12 bridge 1
(g8031-config-switching)#
```

g8031 configure vlan

Use this command to enter g8031 VLAN configuration mode for a specific Ethernet Protection Switching (EPS) link set. Once in this mode, you can add VLANs to be protected by the EPS protection link set.

Command Syntax

```
g8031 configure vlan eps-id EPS-ID bridge <1-32>
g8031 configure vlan eps-id EPS-ID bridge backbone
g8031 configure vlan eps-id EPS-ID bridge (<1-32> | backbone)
```

Parameters

eps-id	EPS link set.
EPS-ID	EPS link set ID <1-4094>.
bridge	Bridge.
<1-32>	Bridge ID.
backbone	Backbone bridge.

Command Mode

Configure mode

Examples

```
#configure terminal
(config)#interface eth2
(config-if)#switchport
(config-if)#bridge-group 1
(config-if)#switchport mode trunk
(config-if)#switchport trunk allowed vlan all
(config-if)#ethernet cfm mep down mpid 11 active true domain test vlan 2
bridge 1
(config-if)#exit
(config)#bridge 1 g8031 eps-id 10 working-port eth1 protection-port eth2
instance 3
(config)#g8031 configure vlan eps-id 10 bridge 1
(g8031-config-vlan)#
```

g8031 ethernet

Use this command to associate an EPS to a Maintenance Domain (MD) and a Maintenance Association (MA).

Use the `no` form of the command to disassociate an EPS from an MD and MA.

Command Syntax

```
g8031 ethernet md-name MD_NAME service-id MA_NAME
no g8031 ethernet md-name MD_NAME service-id MA_NAME
```

Parameters

<code>md-name</code>	Maintenance domain.
<code>MD_NAME</code>	Maintenance domain name.
<code>service-id</code>	Maintenance association.
<code>MA_NAME</code>	Maintenance association name.

Command Mode

G8031 configure switching mode

Examples

```
#configure terminal
(config)#g8031 configure switching eps-id 1 bridge 1
(g8031-config-switching)#g8031 ethernet md-name test service-id testma
(g8031-config-switching)#no g8031 ethernet md-name test service-id testma
```

g8031 exercise

Use this command to issue a protection switching request to test whether APS communication is operating correctly. This command is a lower priority than other switch requests, and is only valid in bidirectional switching, since this is the only mode in which a test can be conducted and a meaningful response received.

This command contains the same requested and bridged signal numbers of the NR (no request) or DNR (do not revert). This can be a null signal when exercise replaces NR, or the normal traffic signal in the case where exercise replaces DNR. In 1-phase APS protocol, the valid response to NR is NR with the corresponding requested and bridged signal numbers. The standard response to DNR should be DNR.

Command Syntax

```
g8031 exercise
no g8031 exercise
```

Parameters

None

Command Mode

G8031 configure switching mode

Examples

```
#configure terminal
(config)#g8031 configure switching eps-id 10 bridge 1
(g8031-config-switching)#g8031 exercise
(g8031-config-switching)#no g8031 exercise
(g8031-config-switching)#exit
```

g8031 force

Use the `g8031 force` command to perform a force switch. A forced switch takes place as long as a protection interface lockout condition is not in effect.

The `g8031 force` command performs similarly to a SONET force switch function. There are times when it is desirable to voluntarily switch traffic between the EPS working and protection paths, such as when performing maintenance on the working interface.

Use the `no` form of this command to clear the force switch and return traffic to the working path.

Command Syntax

```
g8031 force
no g8031 force
```

Parameters

None

Command Mode

G8031 configure switching mode

Examples

```
#configure terminal
(config)#g8031 configure switching eps-id 10 bridge 1
(g8031-config-switching)#g8031 force
(g8031-config-switching)#no g8031 force
```

g8031 local-freeze

Use this command to freeze the state of the protection group.

Use the `no` form of this command clear the freeze.

This is a local (near-end) command request to freeze the state of the protection group. Until the freeze is cleared, additional near end commands are rejected. Condition changes and any APS information received are ignored. When the command is cleared, the state of the protection group is recomputed based on the condition and received APS information.

Command Syntax

```
g8031 local-freeze
no g8031 local-freeze
```

Parameters

None

Command Mode

G8031 configure switching mode

Examples

```
#configure terminal
(config)#g8031 configure switching eps-id 10 bridge 1
(g8031-config-switching)#g8031 local-freeze
(g8031-config-switching)#no g8031 local-freeze
(g8031-config-switching)#exit
```

g8031 local-lockout

Use this command to prevent normal traffic signals from being selected for the protection entity. In bidirectional switching, remote bridge requests for normal traffic signal are still honored to prevent protocol failures. As a result, a normal traffic signal must be locked out from the protection transport entity at both ends to prevent it being selected from the protection transport entity as a result of a command or failure at either end.

This command is a protection switching local (near-end) request to prevent normal traffic signal from being selected from the protection entity. Commands for normal traffic signal are rejected. For normal traffic, any indication of switch failure (SF), or Signal Degrade (SD), if applicable, is ignored.

Use the `no` form of this command to clear the local-lockout.

Command Syntax

```
g8031 local-lockout
no g8031 local-lockout
```

Parameters

None

Command Mode

G8031 configure switching mode

Examples

```
#configure terminal
(config)#g8031 configure switching eps-id 10 bridge 1
(g8031-config-switching)#g8031 local-lockout
(g8031-config-switching)#no g8031 local-lockout
```

g8031 lockdown

Use this command to lock out switching to the protection path under all circumstances. If the protection path is in use when this command is entered, a switch back to the working path is made regardless of its state. This command overrides any outstanding EPS or manual APS command.

Use the `no` form of this command to clear the lockdown.

Command Syntax

```
g8031 lockdown
no g8031 lockdown
```

Parameters

None

Command Mode

G8031 configure switching mode

Examples

```
#configure terminal
(config)#g8031 configure switching eps-id 10 bridge 1
(g8031-config-switching)#g8031 lockdown
(g8031-config-switching)#no g8031 lockdown
```

g8031 manual

Use this command to make a manual switch.

The manual command is only valid when a failure, lockout, or force switch condition is not in effect for the interface to which the traffic is moving. If any of these conditions exist, the manual switch does not take place.

Use the `no` form of this command to clear the manual switch and return traffic to the working path.

Command Syntax

```
g8031 manual
no g8031 manual
```

Parameters

None

Command Mode

G8031 configure switching mode

Examples

```
#configure terminal
(config)#g8031 configure switching eps-id 10 bridge 1
(g8031-config-switching)#g8031 manual
(g8031-config-switching)#no g8031 manual
(g8031-config-switching)#exit
```

g8031 mode

Use this command to set the protection mode bridging and restoration options.

Use the `no` form of the command to unset the protection mode options.

Command Syntax

```
g8031 mode bridging (permanent | non-permanent) restoration (revertive | non-  
    revertive) (unidirectional|)  
no g8031 mode
```

Parameters

<code>bridging</code>	Protection bridge mode
<code>permanent</code>	1+1 (permanent) bridge mode.
<code>non-permanent</code>	1:1 (non-permanent) bridge mode.
<code>restoration</code>	Indicates the desired protection restoration mode:
<code>revertive</code>	Choose revertive restoration mode.
<code>non-revertive</code>	Choose non-revertive restoration mode.
<code>unidirectional</code>	Select unidirectional.

Command Mode

G8031 configure switching mode

Default

The default architecture type for bidirectional is 1:1

Examples

```
#configure terminal  
(config)#g8031 configure switching eps-id 10 bridge 1  
(g8031-config-switching)#g8031 mode bridging permanent restoration non-  
revertive  
(g8031-config-switching)#g8031 mode bridging non-permanent restoration non-  
revertive unidirectional  
(g8031-config-switching)#no g8031 mode
```

g8031 near

Use this command to force the near end test commands with the given signal fields.

Command Syntax

```
g8031 mode near (sf | sf-p | sf-recovers | sfp-recovers)
```

Parameters

<code>sf</code>	Signal Failure.
<code>sf-p</code>	Signal Failure on protection.
<code>sf-recovers</code>	Working recovers from Signal Failure.
<code>sfp-recovers</code>	Protection recovers from Signal Failure.

Command Mode

G8031 configure switching mode

Examples

```
#configure terminal
(config)#g8031 configure switching eps-id 10 bridge 1
(g8031-config-switching)#g8031 mode near sf
```

g8031 set-nr

Use this command to force the near-end state to No Request (NR) with the given signal fields.

This command should only be used when the near-end and far-end state machines cannot synchronize and operator intervention is required to resolve the deadlock.

Command Syntax

```
g8031 set-nr (null-null | normal-normal | null-normal)
```

Parameters

null-null	Requested signal equals null and bridged signal equals null.
normal-normal	Requested signal equals normal and bridged signal equals normal.
null-normal	Requested signal equals null and bridged signal equals normal.

Command Mode

G8031 configure switching mode

Examples

```
#configure terminal
(config)#g8031 configure switching eps-id 10 bridge 1
(g8031-config-switching)#g8031 set-nr null-null
```

g8031 timer

Use this command to set the protection switching timers for a protection link set.

Use the `no` form of this command to set the timers to their default values.

Command Syntax

```
g8031 timer (wait-to-restore TIME-VALUE| hold-off TIME-VALUE)
no g8031 timer (wait-to-restore TIME-VALUE| hold-off TIME-VALUE)
```

Parameters

<code>wait-to-restore</code>	Select the wait-to-restore timer.
<code>TIME-VALUE</code>	Set the value of the timer in seconds in multiples of 60 <300-720> .
<code>hold-off</code>	Select the hold-off timer.
<code>TIME-VALUE</code>	Set the value of the timer in seconds <0-10>.

Command Mode

G8031 configure switching mode

Examples

```
#configure terminal
(config)#g8031 configure switching eps-id 10 bridge 1
(g8031-config-switching)#g8031 timer wait-to-restore 300
(g8031-config-switching)#g8031 timer hold-off 9
```

g8031 signal-sync

Use this command to make an EPS signal-synchronize

Use the `no` form of this command to clear the signal-synchronize

Command Syntax

```
g8031 signal-sync  
no g8031 signal-sync
```

Parameters

None

Command Mode

G8031 configure switching mode

Examples

```
#configure terminal  
(config)#g8031 configure switching eps-id 10 bridge 1  
(g8031-config-switching)#g8031 signal-sync  
(g8031-config-switching)#no g8031 signal-sync  
(g8031-config-switching)#exit
```

g8031 vlan

Use this command to add a VLAN to the protection link set indicated by the most recent `g8031 configure vlan` command.

Each Ethernet Protection Switching (EPS) link set is bound to two interfaces and one or more VLANs. When there is more than one VLAN, one is designated as the primary. The VLANs are mutually exclusive across all the EPS link sets.

Two interfaces can be part of a different link set if the VLANs associated with each link set are different. The same VLAN and the same interfaces cannot be configured to multiple link sets. Any one of the working or protection interfaces participating in another protection group also cannot contain overlapping VLANs. If you try to configure the same working and protection interfaces in two or more link sets and then try to associate them with the same VLANs, you get an error message.

Command Syntax

```
g8031 vlan VID (primary|)
```

Parameters

VID	VLAN ID.
primary	Indicates this is a primary VLAN when there is more than one VLAN assigned to an EPS link set.

Command Mode

G8031 configure switching mode

Examples

```
#configure terminal
(config)#g8031 configure vlan esp-id 1 bridge 1 instance 64
(g8031-config-vlan)#g8031 vlan 1 primary
(g8031-config-vlan)#g8031 vlan 2
```

show bridge eps-id

Use this command to display Ethernet protection switching information for an EPS group protection link set on the specified bridge group.

Command Syntax

```
show bridge <1-32> eps-id EPS_ID g8031
show bridge backbone eps-id EPS_ID g8031
show bridge (<1-32> | backbone) eps-id EPS_ID g8031
```

Parameters

bridge	Bridge.
<1-32>	Bridge ID.
backbone	Backbone bridge.
eps-id	EPS link set.
EPS-ID	EPS link set ID <1-4094>.

Command Mode

Exec mode and Privilege Exec mode

Examples

The example below shows the command and the output of its execution.

```
#show bridge 2 eps-id 1 g8031
Bridge EpsID Working-Path Protection-Path Current-State
-----
2      10      eth1          eth2          No Request
Primary Vid - 3
Active-Path - Working
DFOP State - Not in defect mode
Protected Vlans - 4
```

show bridge g8031

Use this command to display summary EPS information for the specified bridge group.

Command Syntax

```
show bridge <1-32> g8031
show bridge backbone g8031
show bridge (<1-32> | backbone) g8031
```

Parameters

bridge	Bridge.
<1-32>	Bridge ID.
backbone	Backbone bridge.

Command Mode

Exec mode and Privilege Exec mode

Examples

The example below shows the command and the output of its execution.

```
#show bridge 2 g8031
Bridge EpsID Working-Path Protection-Path Current-State
-----
2          10          eth1          eth2          No Request
Primary Vid - 3
Active-Path - Working
DFOP State - Not in defect mode
Protected Vlans - 4

Bridge EpsID Working-Path Protection-Path Current-State
-----
2          20          eth3          eth4          No Request
Primary Vid - 5
Active-Path - Working
DFOP State - Not in defect mode
Protected Vlans - 6
```


CHAPTER 17 G.8032 ERPS Version 1 Commands

This chapter contains G.8032 (2008) Ethernet Ring Protection Switching (ERPS) version 1 commands.

Note: These commands are obsolete for the x86 platform.

- [bridge g8032 ring-id](#)
- [g8032 configure switching](#)
- [g8032 md-name](#)
- [g8032 mep](#)
- [g8032 rpl](#)
- [g8032 shared-link](#)
- [g8032 timer](#)
- [show bridge g8032](#)

bridge g8032 ring-id

Use this command to create a Ethernet Ring Protection group.

Use the `no` form of this command to delete a Ethernet Ring Protection group.

Note: Provider Backbone Bridging is not supported for ZebIC releases.

Command Syntax

```
bridge <1-32> g8032 ring-id RINGID east-interface IFNAME west-interface IFNAME
(instance <1-63> |)

bridge (<1-32> | backbone) g8032 ring-id RINGID east-interface IFNAME west-
interface IFNAME (instance <1-63> |)

no bridge <1-32> g8032 ring-id RINGID

no bridge (<1-32> | backbone) g8032 ring-id RINGID
```

Parameters

bridge	Bridge.
<1-32>	Bridge ID.
backbone	Backbone bridge.
ring-id	Ethernet Ring Protection group
RINGID	Ethernet Ring Protection group ID <1-65535>
east-interface	The east interface.
IFNAME	The east interface name.
west-interface	The west interface.
IFNAME	The west interface name.

Command Mode

Configure mode

Examples

```
#configure terminal
(config)#bridge 1 g8032 ring-id 1 east-interface eth0 west-interface eth1
instance 2
(config)#no bridge 1 g8032 ring-id 1
```

g8032 configure switching

Use this command to enter G8032 configure switching mode and set up an Ethernet Ring Protection group.

Note: Provider Backbone Bridging is not supported for ZebIC releases.

Command Syntax

```
g8032 configure switching ring-id RINGID bridge <1-32>
```

```
g8032 configure switching ring-id RINGID bridge (<1-32> | backbone)
```

Parameters

ring-id	Ethernet Ring Protection group
RINGID	Ethernet Ring Protection group ID <1-65535>
bridge	Bridge.
<1-32>	Bridge ID.
backbone	Backbone bridge.

Command Mode

Configure mode

Examples

```
#configure terminal
(config)#g8032 configure switching ring-id 1 bridge 1
(g8032-config-switching)#
```

g8032 md-name

Use this command to associate a G8032 ring with a Maintenance Domain (MD) and a Maintenance Association (MA).

Use the `no` form of this command to disassociate a G8032 ring with an MD and MA.

Note: Provider Backbone Bridging is not supported for ZebIC releases.

Command Syntax

```
g8032 ethernet md-name MD_NAME service-id MA_NAME
no g8032 ethernet md-name MD_NAME service-id MA_NAME
```

Parameters

<code>md-name</code>	Maintenance domain.
<code>MD_NAME</code>	Maintenance domain name.
<code>service-id</code>	Maintenance association.
<code>MA_NAME</code>	Maintenance association name.

Command Mode

G8032 configure switching mode

Examples

```
#configure terminal
(config)#g8032 configure switching eps-id 1 bridge 1
(g8032-config-switching)#g8032 ethernet md-name test service-id testma
(g8032-config-switching)#no g8032 ethernet md-name test service-id testma
```

g8032 mep

Use this command to set RMEPs associated with MEPs.

Use the `no` form of this command to unset the association.

Note: This command is applicable only for ZebIC.

Command Syntax

```
g8032 mep mpid MPID rmepid RMEPID
no g8032 mep mpid MPID rmepid RMEPID
```

Parameters

<code>mpid</code>	Configure the mepid.
<code>rmepid</code>	Configure the MEPID of remote MEP.

Command Mode

G8032 configure cfm mode

Examples

```
#configure terminal
(config)#g8032 configure switching ring-id 1 bridge 1
(g8032-config-switching)#g8032 md-name abc service-id xyz bridge 1 ring-id
10(g8032-config-cfm)#g8032 mep mpid 10 rmepid 20
(g8032-config-cfm)#no g8032 mep mpid 10 rmepid 20
(g8032-config-cfm)#exit
(g8032-config-switching)#
```

g8032 rpl

Use this command to set the G8032 Ring Protection Link (RPL).

Command Syntax

```
g8032 rpl (owner | non-owner) (east-interface|west-interface)
g8032 rpl non-owner none
```

Parameters

owner	Designates this ring node as the RPL owner.
non-owner	Designates this ring node as not owning the RPL.
none	Designates this ring node has no RPL port defined.
east-interface	
	Specify the east ring interface as the RPL.
west-interface	
	Specify the west ring interface as the RPL.

Command Mode

G8032 configure switching mode

Examples

```
#configure terminal
(config)#g8032 configure switching ring-id 1 bridge 1
(g8032-config-switching)#g8032 rpl owner east-interface

(config)#g8032 configure switching ring-id 1 bridge 1
(g8032-config-switching)#exit

#configure terminal
(config)#g8032 configure switching ring-id 1 bridge 1
(g8032-config-switching) #g8032 rpl non-owner none
```

g8032 shared-link

Use this command to designate a ring link that is shared between two ring networks.

Command Syntax

```
g8032 shared-link interface IFNAME peer-ring RINGID
```

Parameters

interface	The interface.
IFNAME	The interface name.
peer-ring	Ethernet Ring Protection group
RINGID	Ethernet Ring Protection group ID <1-65535>

Command Mode

G8032 configure switching mode

Examples

```
#configure terminal
(config)#g8032 configure switching ring-id 1 bridge 1
(g8032-config-switching)#g8032 shared-link interface eth0 peer-ring 3
```

g8032 timer

Use this command to set timers for a protection group.

Use the `no` form of this command to set the timers to their default values.

Command Syntax

```
g8032 timer (wait-to-restore TIMEVAL | hold-off TIMEVAL | guard-timer TIMEVAL)
no g8032 timer (wait-to-restore TIMEVAL | hold-off TIMEVAL | guard_timer TIMEVAL)
```

Parameters

<code>guard-timer</code>	Select the guard timer
<code>TIMEVAL</code>	Set the value of the timer in milliseconds in multiples of 10 <10-2000>.
<code>hold-off</code>	Select the hold-off timer.
<code>TIMEVAL</code>	Set the value of the timer in milliseconds <0-10>..
<code>wait-to-restore</code>	Select the wait-to-restore timer.
<code>TIMEVAL</code>	Set the value of the timer in seconds in multiples of 60 <300-720> .

Command Mode

G8032 configure switching mode

Examples

```
#configure terminal
(config)#g8032 configure switching ring-id 1 bridge 1
(g8032-config-switching)#g8032 timer wait-to-restore 360
```

show bridge g8032

Use this command to display information for a ring protection link set.

Command Syntax

```
show bridge <1-32> g8032
show bridge (<1-32>|backbone) g8032
show bridge <1-32> g8032 ring-id RINGID
show bridge (<1-32>|backbone) g8032 ring-id RINGID
```

Parameters

bridge	Bridge.
<1-32>	Bridge ID.
backbone	Backbone bridge.
ring-id	Ethernet Ring Protection group
RINGID	Ethernet Ring Protection group ID <1-65535>

Command Mode

Exec mode and Privilege Exec mode

Examples

```
#show bridge 1 g8032
#show bridge 1 g8032 ring-id 1
```


CHAPTER 18 G.8032 ERPS Version 2 Commands

This chapter contains the G.8032 (2012) Ethernet Ring Protection Switching (ERPS) version 2 commands.

Note: ERPS version 2 is not supported for ZebIC releases.

- [bridge g8032 physical-ring](#)
- [enable revertive](#)
- [force-switch|manual-switch](#)
- [g8032 erp-instance](#)
- [g8032 profile](#)
- [level](#)
- [non-virtual-channel](#)
- [physical-ring](#)
- [profile name](#)
- [ring-id](#)
- [rpl role](#)
- [show g8032 erp-instance](#)
- [show g8032 physical-ring](#)
- [show g8032 profile](#)
- [sub-ring](#)
- [tcn-propagation](#)
- [timer](#)
- [version](#)
- [virtual-channel](#)
- [vlan](#)

bridge g8032 physical-ring

Use this command to create a physical ring and associate east and west interfaces with it. All ERP instances on this ring have the same east and west interfaces,

Use the `no` form of this command to delete a physical ring.

Command Syntax

```
bridge (<1-32> | backbone) g8032 physical-ring RINGNAME east-interface IFNAME
west-interface IFNAME

no bridge (<1-32> | backbone) g8032 physical-ring RINGNAME
```

Parameters

bridge	Bridge.
<1-32>	Bridge identifier.
backbone	Backbone bridge.
physical-ring	Physical ring.
RINGNAME	Physical ring name (maximum 37 characters).
east-interface	East interface.
IFNAME	East interface name.
west-interface	West interface.
IFNAME	West interface name.

Command Mode

Configure mode

Examples

```
#configure terminal
(config)#bridge 1 g8032 physical-ring ring1 east-interface eth1 west-interface
eth2
(config)#no bridge 1 g8032 physical-ring ring1 disable
```

enable revertive

Use this command to set the revertive behavior of the ring node.

Command Syntax

```
enable (revertive | non-revertive)
```

Parameters

revertive	Revertive behavior.
non-revertive	Non-revertive behavior.

Command Mode

G.8032 profile configure mode

Examples

```
(g8032-profile-config)#enable revertive
```

force-switch|manual-switch

Use this command to configure administrative commands.

Command Syntax

```
((force-switch|manual-switch) (east-interface|west-interface)) |clear)
```

Parameters

force-switch	Forcefully block a ring port.
manual-switch	Manually block a ring port.
east-interface	Apply command to east interface.
west-interface	Apply command to west interface.
clear	Cancel a command.

Command Mode

G.8032 configure switch mode

Examples

```
(g8032-config-switch)#force-switch east-interface
```

g8032 erp-instance

Use this command to create an ERP instance and change to G.8032 configure switch mode.

Use the `no` form of this command to delete an ERP instance.

Command Syntax

```
g8032 erp-instance INSTANCENAME bridge (<1-32> | backbone)
no g8032 erp-instance INSTANCENAME bridge (<1-32> | backbone)
```

Parameters

INSTANCENAME	Instance name (maximum 32 characters).
bridge	Bridge.
<1-32>	Bridge identifier.
backbone	Backbone bridge.

Command Mode

Configure mode

Examples

```
#configure terminal
(config)#g8032 erp-instance instance1 bridge 1
(g8032-config-switch)#
```

g8032 profile

Use this command to create a profile on a bridge and switch to G.8032 profile configure mode.

Use the `no` form of this command delete a profile on a bridge.

Command Syntax

```
g8032 profile PROFILENAME bridge (<1-32> | backbone)
no g8032 profile PROFILENAME bridge (<1-32> | backbone)
```

Parameters

PROFILENAME	Profile name (maximum 32 characters).
bridge	Bridge.
<1-32>	Bridge identifier.
backbone	Backbone bridge.

Command Mode

Configure mode

Examples

```
#configure terminal
(config)#g8032 profile profile123 bridge 1
(g8032-profile-config)#
```

level

Use this command to set the maintenance entity group (MEG) level (MEL) to carry in R-APS messages.

Command Syntax

```
level <0-7>
```

Parameters

<0-7> Level.

Command Mode

G.8032 configure switch mode

Examples

```
(g8032-config-switch)#level 2
```

non-virtual-channel

Use this command to make a sub-ring function without a virtual channel.

Use the `no` form of this command to delete a non-virtual channel.

Command Syntax

```
non-virtual-channel
no non-virtual-channel
```

Parameters

None

Command Mode

G.8032 configure switch mode

Examples

```
(g8032-config-switch)#non-virtual-channel
```

physical-ring

Use this command to associate the ERP instance to a physical ring.

Command Syntax

```
physical-ring RINGNAME
```

Parameters

RINGNAME	Physical ring name.
----------	---------------------

Command Mode

G.8032 configure switch mode

Examples

```
(g8032-config-switch)#physical-ring ring1
```

profile name

Use this command to associate the ERP instance to a profile.

Command Syntax

```
profile name PROFILENAME
```

Parameters

PROFILENAME Profile name.

Command Mode

G.8032 configure switch mode

Examples

```
(g8032-config-switch)#profile prof_1
```

ring-id

Use this command to set the ring identifier.

Command Syntax

```
ring-id <1-255>
```

Parameters

<1-255>	Ring identifier.
---------	------------------

Command Mode

G.8032 configure switch mode

Examples

```
(g8032-config-switch)#ring-id 1
```

rpl role

Use this command to set the RPL (Ring Protection Link) role of the ring node.

Command Syntax

```
rpl role ((owner | neighbor | next-neighbor) (east-interface | west-interface) |  
non-owner )
```

Parameters

owner	Ring node is the RPL owner.
neighbor	Ring node is neighbor to the RPL owner.
next-neighbor	Ring node is neighbor to the neighbor of the RPL owner.
east-interface	Role assigned to east interface.
west-interface	Role assigned to west interface.
non-owner	Ring node does not own the RPL.

Command Mode

G.8032 configure switch mode

Examples

```
(g8032-config-switch)#rpl role owner east-interface
```

show g8032 erp-instance

Use this command to display details about an ERP instance.

Command Syntax

```
show g8032 erp-instance INSTANCENAME bridge (<1-32>|backbone)
```

Parameters

INSTANCENAME	Instance name.
bridge	Bridge.
<1-32>	Bridge identifier.
backbone	Backbone bridge.

Command Mode

Configure mode

Example

```
(config)#show g8032 erp-instance instance1 bridge 1
Inst Name   : instance1
State       : G8032_ST_INIT
Phy Ring    : -
Role        : -
East Link   : -
West Link   : -
Attached    : -
Attached To : -
Virt Chan   : -
```

```
-----
      Channel      |      Interface      |  Profile
(LEVL, VID, RID)  | (east,ver), (west,ver) |
=====
(7, 4065, 135)    | (eth11,1), (eth2,2)   | PROF1
=====
Data Traffic: 1,2,3,10,12...
```

show g8032 physical-ring

Use this command to display details about a physical ring.

Command Syntax

```
show g8032 physical-ring RINGNAME bridge (<1-32>|backbone)
```

Parameters

RINGNAME	Ring name.
bridge	Bridge.
<1-32>	Bridge identifier.
backbone	Backbone bridge.

Command Mode

Configure mode

Examples

```
(config)#show g8032 physical-ring ring1 bridge1
Ring      : ring1
=====
Bridge    : 1
East      : eth1
West      : eth2
ERP Inst  : inst1, inst2, inst3
```

show g8032 profile

Use this command to display details about a profile.

Command Syntax

```
show g8032 profile PROFILENAME bridge (<1-32>|backbone)
```

Parameters

PROFILENAME	Profile name.
bridge	Bridge.
<1-32>	Bridge identifier.
backbone	Backbone bridge.

Command Mode

Configure mode

Examples

```
(config)#show g8032 profile profile1 bridge 1
Profile : profile1
=====
Wait-To-Restore : 5 mins
Hold Off Timer  : 0 secs
Guard Timer     : 500 ms
Wait-To-Block   : 5500 ms
Protection Type  : Revertive
```

sub-ring

Use this command to make the ERP instance a sub-ring. You should only give this command on interconnection nodes.

Use the `no` form of this command to make the ERP instance a major ring.

Command Syntax

```
sub-ring block (east-interface|west-interface)
no sub-ring
```

Parameters

east-interface	
	Block east interface.
west-interface	
	Block west interface.

Command Mode

G.8032 configure switch mode

Examples

```
(g8032-config-switch)#sub-ring block east-interface
```

tcn-propagation

Use this command to enable or disable TCN (topology change notification) propagation for an interconnected ring.

Command Syntax

```
tcn-propagation (enable|disable)
```

Parameters

enable	Enable TCN propagation.
disable	Disable TCN propagation.

Command Mode

Configure mode

Examples

```
(config)#tcn-propagation enable
```

timer

Use this command to set timers.

Command Syntax

```
timer (wait-to-restore (<1-12>|default) | hold-off (<0-100>|default) | guard-timer  
(<1-200>|default))
```

Parameters

wait-to-restore

Wait-to-restore timer used to verify that a signal failure is not intermittent.

<1-12> Timer value in minutes.

default Default value of timer <5>.

hold-off Hold-off timer used to filter intermittent link faults.

<0-100> Timer value in a multiple of 100 milliseconds.

default Default value of timer <0>.

guard-timer Guard timer that blocks latent outdated messages from causing unnecessary state changes.

<1-200> Timer value in a multiple of 10 milliseconds.

default Default value of timer <50>.

Command Mode

G.8032 profile configure mode

Examples

```
(g8032-profile-config)#timer wait-to-restore 7  
(g8032-profile-config)#timer hold-off 50  
(g8032-profile-config)#timer guard-timer 30
```

version

Use this command to set the version to carry in R-APS messages for an interface.

Command Syntax

```
version <0-1> (east-interface | west-interface)
```

Parameters

<0-1>	Version:
0	ITU-T Recommendation G.8032/Y.1344 2008
1	ITU-T Recommendation G.8032/Y.1344 2012
east-interface	
	Assigned to east interface.
west-interface	
	Assigned to west interface.

Command Mode

G.8032 configure switch mode

Examples

```
(g8032-config-switch)#version 1 east-interface
```

virtual-channel

Use this command on a sub-ring to attach it to a major instance.

Use the `no` form of this command to delete a virtual channel.

Command Syntax

```
virtual-channel (<2-4094>|) attached-to-instance INSTANCENAME  
no virtual-channel
```

Parameters

<2-4094>	VLAN identifier.
INSTANCENAME	Major instance name.

Command Mode

G.8032 configure switch mode

Examples

```
(g8032-config-switch)#virtual-channel 3 attached-to-instance inst1
```

vlan

Use this command to add a VLAN to the ERP instance and set its type.

Use the no forms of this command to disassociate a VLAN from the ERP instance.

Command Syntax

```
vlan <2-4094> (raps-channel | data-traffic)
no raps-channel
no data-traffic <2-4094>
```

Parameters

<2-4094>	VLAN identifier.
raps-channel	Direct R-APS traffic on this VLAN.
data-traffic	Direct data traffic on this VLAN.

Command Mode

G.8032 configure switch mode

Examples

```
(g8032-config-switch)#vlan 3 raps-channel
```


Appendix A CFM Version 1 Commands

This appendix contains CFM version 1 commands. These commands are obsolete and are included here for reference.

- [ethernet cfm 1dm mepid](#) on page 417
- [ethernet cfm 1dm receive](#) on page 418
- [ethernet cfm ais interval](#) on page 419
- [ethernet cfm ais status](#) on page 420
- [ethernet cfm cc multicast](#) on page 421
- [ethernet cfm cc unicast](#) on page 422
- [ethernet cfm mep clear](#) on page 423
- [ethernet cfm mep domain](#) on page 425
- [ethernet cfm mep domain tx-lbm-messages](#) on page 427
- [ethernet cfm mep domain tx-lbm-status](#) on page 428
- [ethernet cfm dmm mepid](#) on page 429
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- [ethernet cfm exm](#) on page 431
- [ethernet cfm in-service](#) on page 432
- [ethernet cfm lmm mpid](#) on page 433
- [ethernet cfm mcc](#) on page 434
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- [ethernet cfm out-of-service](#) on page 436
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- [ethernet cfm vsm](#) on page 479
- [snmp restart cfm_v1](#) on page 480

ethernet cfm 1dm mepid

Use this command to configure MEP ID of one-way delay measurement (1DM) frames for the host MEP.

Command Syntax

```
ethernet cfm 1dm mepid MEPID (unicast (rmpid MEPID)|multicast)
    duration DURATION domain DOMAIN_NAME (vlan VLAN_ID|)
    ((interval (1 | 2 | 3 | 4))|) (bridge <1-32>|)
```

Parameters

mepid	Specify the host MEP.
multicast	Specify the multicast delay measurement.
unicast	Specify the unicast delay measurement.
rmpid	Specify the MEPID of remote MEP.
duration	Specify an integer that sets the delay measurement duration <5-60>.
domain	Specify the maintenance domain name.
bridge	Specify an ID of a bridge <1-32>.
interval	Specify a DMM transmission interval.
1	Specify a DM Transmission interval <100 ms>.
2	Specify a DM Transmission interval <10 ms>.
3	Specify a DM Transmission interval <1 second>.
4	Specify a DM Transmission interval <10 seconds>.
vlan	Specify the primary-VID of the MA.

Command Mode

Exec mode and Privileged Exec mode

Example

```
#ethernet cfm 1dm mepid 1 unicast rmpid 1 duration 1 domain 1
```

ethernet cfm 1dm receive

Use this command to configure reception of one-way delay measurement (1DM) frames for the host MEP, set the duration, associate the MEP to an `DOMAIN_NAME`, and optionally, to a `VID` and a `bridge`.

Command Syntax

```
ethernet cfm 1dm receive mepid MEPID duration DURATION domain DOMAIN
(vlan VLAN_ID|) (bridge <1-32>|)
```

Parameters

mepid	Specify the host MEP.
duration	Specify an integer in the range of <5-60> that sets the delay measurement duration.
domain	Specify the maintenance domain name.
vlan	Specify an integer that identifies a VLAN.
bridge	Specify an ID of a bridge in the range of <1-32>.

Command Mode

Exec mode and Privileged Exec mode

Example

```
#ethernet cfm 1dm receive mepid 4 duration 7 domain 1 bridge 1
#
#ethernet cfm 1dm receive mepid 23 duration 5 domain abc bridge 1
#
```

ethernet cfm ais interval

Use this command to configure a transmission interval between Alarm Indicator Signal (AIS) frames for a maintenance end point in a domain, and to set domain, VLAN, and bridge identities.

An internal counter is maintained for the number of AIS instances running. The maximum value of this counter is fixed at eight.

Command Syntax

```
ethernet cfm ais interval TX_INTERVAL mpid MEPID domain DOMAIN_NAME (vlan VLAN_ID|)
    (bridge <1-32>|)
```

Parameters

interval	Set the transmission interval for AIS in seconds.
TX_INTERVAL	Enter 1 or 60 seconds for the transmission interval.
mpid	Specify the host MEP.
domain	Specify the name of the domain.
bridge	Specify an ID of a bridge <1-32>.
vlan	Specify the primary-VID of the MA.

Command Mode

Exec mode and Privileged Exec mode

Example

```
#ethernet cfm ais interval 10 mpid 6 domain abc vlan 3 bridge 1
```

ethernet cfm ais status

Use this command to enable or disable AIS frame transmission for a MEP. AIS frames are triggered by Ethernet down events. Unicast AIS events can be can be monitored if the MAC address of the remote MEP is provisioned locally.

An internal counter is maintained for each AIS instance that is running. The maximum number of instances supported is eight.

Command Syntax

```
ethernet cfm ais status (enable | disable) (all | loc | mismerge | unexpected-mep |
unexpected-meg-level | unexpected-period) mep MEPID domain DOMAIN_NAME
level LEVEL (unicast RMEP_MAC | multicast) (vlan VLAN_ID|) (bridge <1-32>|)
```

Parameters

enable	Enable AIS frame monitoring on the source MEP.
disable	Disable AIS frame monitoring on the source MEP.
all	Specify AIS for all defect condition.
loc	Specify AIS for loss of continuity.
mismerge	Specify AIS for incorrect MEG ID.
unexpected-meg-level	Specify AIS for incorrect MEG level.
unexpected-mep	Specify AIS for unexpected MEP ID received.
unexpected-period	Specify AIS for mis-matched in period received.
mep	Specify the host MEP.
domain	Specify the name of the domain.
level	Specify the level for AIS transmission.
multicast	Specify the multicast ais frame to be sent
unicast	Specify the unicast ais frame to be sent
RMEP_MAC	Specify a remote MEP MAC address in the format HHHH.HHHH.HHHH.
bridge	Specify the bridge group name used for bridging <1-32>.
vlan	Specify the primary-VID of the MA.

Command Mode

Interface mode

ExampleS

This example enables AIS status on mep 5 for unicast frames at the specified MAC address in domain abc, at level 3, for VLAN 3 and bridge 1:

```
(config)#interface eth1
(config-if)#ethernet cfm ais status enable all mep 5 domain new level 1 unicast
2222.1111.432a vlan 3 bridge 1
```

ethernet cfm cc multicast

Use this command to enable or disable multicast CC on a specific MEP. When the continuity checking state is set to `enable`, the MEP sends periodic multicast frames. When the status is set to `disable`, the MEP stops sending multicast frames.

Command Syntax

```
ethernet cfm cc multicast state (enable|disable) domain DOMAIN_NAME mepid MEPID
(vlan VLAN_ID|) (bridge <1-32>|)
```

Parameters

<code>state</code>	Specify to either enable or disable CFM multicast continuity checking.
<code>domain</code>	Specify the name of the maintenance domain.
<code>mepid</code>	Specify the MEPID ranging from <1-8191>
<code>vlan</code>	Specify the primary-VID of the MA.
<code>bridge</code>	Specify the bridge group name used for bridging <1-32>.

Command Mode

Interface mode

Examples

```
#configure terminal
(config)#interface eth1
(config-if)#ethernet cfm cc multicast state enable domain abc mepid 23 vlan 3
bridge 1
(config-if)#ethernet cfm cc multicast state enable domain abc mepid 23 bridge
1
```

ethernet cfm cc unicast

Use this command to enable or disable point-to-point unicast Continuity Check Messaging between a host MEP and a remote MEP in an MD. A VLAN or bridge ID can also be specified.

Choosing the `enable` option starts point-to-point unicast CCM between the host MEP (`mpid`) and the remote MEP (`rmepid`). Unicast CCM frames are periodically sent to the specified MEP. Choosing the `disable` option stops unicast point-to-point CC messaging between the host MEP and the remote MEP.

Command Syntax

```
ethernet cfm cc unicast mpid MEPID rmpid RMEPID state(enable|disable)
domain DOMAIN_NAME (vlan VLAN_ID|) (bridge <1-32>|)
```

Parameters

<code>mpid</code>	Identity of the host MEP.
<code>rmpid</code>	Identify of the remote MEP.
<code>state</code>	Specify to either enable or disable CFM multicast continuity checking.
<code>domain</code>	Specify the name of the maintenance domain.
<code>mepid</code>	Specify the MEPID ranging from <1-8191>
<code>vlan</code>	Specify the primary-VID of the MA.
<code>bridge</code>	Specify the bridge group name used for bridging <1-32>.

Command Mode

Interface mode

Examples

```
#configure terminal
(config)#interface eth1
(config-if)#ethernet cfm cc domain 5 interval 1 bridge 1
(config-if)#ethernet cfm cc unicast mpid 23 rmpid 29 state enable domain abc
vlan 3 bridge 1
(config-if)#ethernet cfm cc unicast mpid 23 rmpid 29 state disable domain abc
vlan 3 bridge 1
(config-if)#ethernet cfm cc unicast mpid 23 rmpid 29 state enable domain abc
bridge 1
(config-if)#ethernet cfm cc unicast mpid 23 rmpid 29 state disable domain abc
bridge 1
```

ethernet cfm mep clear

Use this command to clear one or more, or all attribute values for a link-level MEP. When values are cleared, they are reset to the default attribute values.

Command Syntax

```
ethernet cfm mep MEPID clear domain DOMAIN_NAME vid VLANID (ccm-ltm-priority |
lowest-priority-defect | fng-alarm-time | reset-fng-time | active | tx-lbm-status
| tx-lbm-destination-mac | tx-lbm-destination-mepid | tx-lbm-destination-is-mepid
| tx-lbm-messages | tx-lbm-data-tlv | tx-lbm-vlan-priority | tx-lbm-vlan-drop-
enable | ccm-ltm-flags | tx-ltm-target-mac | tx-ltm-target-mepid | tx-ltm-target-
is-mepid | tx-ltm-ttl | tx-ltm-egress-id STRING | all) ((bridge <1-32>|backbone)|)
```

Parameters

mep	Specify an integer that identifies the host MEP.
domain	Specify the name of the maintenance domain in ASCII format.
active	Specify the administrative state of the MEP.
all	Specify the bridge group commands.
ccm-ltm-flags	Specify the transmit LTM Target MAC Address.
ccm-ltm-priority	Specify the CCM linktrace message priority.
fng-alarm-time	Specify the time that the defect must be absent before alarm is cleared.
lowest-priority-defect	Specify the lowest priority defect value.
reset-fng-time	Specify the reset FNG time.
tx-lbm-status	Specify the transmit loopback message status.
tx-lbm-destination-mac	Specify the destination MAC address for LBM
tx-lbm-destination-mepid	Specify the ID of the transmit LBM destination MEP.
tx-lbm-destination-is-mepid	Specify the transmit LBM destination is the same as the source MEP.
tx-lbm-messages	Specify the transmit LBM.
tx-lbm-data-tlv	Specify the transmit LBM data TLV.
tx-lbm-vlan-priority	

Specify the transmit LBM VLAN priority.

`tx-lbm-vlan-drop-enable`

Specify to enable drop for transmit LBM on this VLAN.

`tx-ltm-target-mac`

Specify the MAC address of target MEP for LTM transmission.

`tx-ltm-target-mepid`

Specify the ID of target MEP for LTM transmission.

`tx-ltm-target-is-mepid`

Specify the LTM transmission target MEP ID is the same as the source MEP.

`tx-ltm-ttl` Specify the TTL value for LTM transmission.

`vid` Enter the primary-vid of the maintenance-association.

`STRING` (Optional) String that identifies the LTM egress ID.

`backbone` Specify the bridge as a backbone bridge.

`bridge` Specify the bridge group name used for bridging <1-32>.

Command Mode

Interface mode

Examples

```
#configure terminal
(config)#interface eth1
(config-if)#ethernet cfm mep 23 clear domain abc all bridge 1
(config-if)#ethernet cfm mep 23 clear domain abc active bridge 1 bridge 1

#configure terminal
(config)#interface eth1
(config-if)#ethernet cfm mep 23 clear domain abc vid 3 all bridge 1
(config-if)#ethernet cfm mep 23 clear domain abc vid 3 active bridge 1
```


ethernet cfm mep domain

Use this command to configure counters for Continuity Check Message (CCM) priority, Linktrace Message (LTM) priority, and Fault Notification Generation (FNG) timers for a MEP.

Command Syntax

```
ethernet cfm mep MEPID domain DOMAIN_NAME (vid VLANID) ((ccm-ltm-priority
  VAL)|(lowest-priority-defect VAL) |(fng-alarm-time VAL)|(reset-fng-time
  VAL)|(active (true|false))) ((bridge <1-32>|backbone)|)

ethernet cfm mep MEPID domain DOMAIN_NAME (vid VLANID) ((ccm-ltm-flags VAL)|
  (tx-ltm-target-mac MAC) |(tx-ltm-target-mepid MEPID)|(tx-ltm-target-is-mepid
  (true|false)) |(tx-ltm-ttl VAL)|(tx-ltm-egress-id STRING))
  ((bridge <1-32>|backbone)|)

ethernet cfm mep MEPID domain DOMAIN_NAME (vid VLANID) ((tx-lbm-status
  (true|false))|(tx-lbm-destination-mac MACADDRESS)|(tx-lbm-destination-mepId
  MEPID)|(tx-lbm-destination-is-mepId (true|false))|(tx-lbm-messages COUNT)|(tx-
  lbm-data-tlv STRING)|(tx-lbm-vlan-priority VAL)|(tx-lbm-vlan-drop-enable
  (true|false))|(tx-lbm-time-out-value TIMEOUT_VAL)) ((bridge <1-32>|backbone)|))
```

Parameters

mep	Specify an integer that identifies the host MEP.
domain	Specify the name of the maintenance domain in ASCII format.
active	Specify the administrative state of the MEP.
ccm-ltm-flags	Specify the transmit LTM Target MAC address.
ccm-ltm-priority	Specify the CCM linktrace message priority.
fng-alarm-time	Specify the time that defects must be present before alarm is generated.
lowest-priority-defect	Specify the lowest level defect allowed to generate alarms.
reset-fng-time	Specify the time that the defect must be absent before alarm is cleared.
tx-lbm-data-tlv	Specify the data to be included in the data TLV
tx-lbm-destination-is-mepId	Specify to use the MEPID for the destination MEP.
tx-lbm-destination-mac	Specify the MAC for the destination
tx-lbm-destination-mepId	Specify the remote MEP ID.
tx-lbm-messages	

Specify the number for LBMs to be sent, which triggers LBM from SNMP (see [ethernet cfm mep domain tx-lbm-messages](#) on page 427).

tx-lbm-status

Specify that the LBM transmission is allowed or not allowed (see [ethernet cfm mep domain tx-lbm-status](#) on page 428).

tx-lbm-vlan-drop-enable

Specify the drop enable bit in VLAN tag.

tx-lbm-vlan-priority

Specify the VLAN priority in the VLAN tag.

tx-ltm-egress-id

Specify the transmit LTM Egress ID.

tx-ltm-target-is-mepid

Specify the IS transmit ltm target MEPID.

tx-ltm-target-mac

Specify the transmit LTM target mac address.

tx-ltm-target-mepid

Specify the transmit LTM Target MEP ID.

tx-ltm-target-is-mepid

Specify the LTM transmission target MEP ID is the same as the source MEP.

tx-ltm-ttl Specify the transmit LTM TTL value, which is the trigger for sending LT messages.

vid Enter the primary-vid of the maintenance-association.

false MEP is to cease functioning

true MEP is to function normally

STRING (Optional) String that identifies the LTM egress ID.

backbone Specify the bridge as a backbone bridge.

bridge Specify the bridge group name used for bridging <1-32>.

Command Mode

Interface mode

Example

```
#configure terminal
(config)#interface eth1
(config-if)#ethernet cfm mep 23 domain abc vid 3 ccm-ltm-priority 3 bridge 1
(config-if)#ethernet cfm mep 23 domain abc vid 3 lowest-priority-defect 3
bridge 1
(config-if)#ethernet cfm mep 23 domain abc vid 3 fng-alarm-time 250 bridge 1
(config-if)#ethernet cfm mep 23 domain abc vid 3 reset-fng-time 250
```

ethernet cfm mep domain tx-lbm-messages

Use this command to configure counters related to Linktrace Message (LTM) transmissions for a MEP.

Command Syntax

```
ethernet cfm mep (MEPID) | domain (DOMAIN_NAME) | tx-lbm-messages [COUNT <1-5> | bridge  
<1-32> | backbone]
```

Parameters

mep	Specify the integer that identifies the host MEP.
domain	Specify the name of the maintenance domain in ASCII format.
tx-lbm-messages	
	Specify the number for LBMs to be sent, which would triggers LBM from SNMP.
COUNT	Specify the number of LBM messages transmitted <1-5>.
bridge	Specify the ID of a bridge in the range of <1-32>.
backbone	Specify that the bridge is a backbone.

Command Mode

Interface mode

Example

```
(config)#interface eth1  
(config-if)#ethernet cfm mep 23 domain abc vid 1 tx-lbm-messages 1
```

ethernet cfm mep domain tx-lbm-status

Use this command to configure counters for Loopback Message (LBM) transmission for a MEP.

Command Syntax

```
ethernet cfm mep (MEPID) | domain (DOMAIN_NAME) | tx-lbm-status (false|true) | [bridge  
<1-32> | backbone]
```

Parameters

mep	Specify the integer that identifies the host MEP.
domain	Specify the name of the maintenance domain in ASCII format.
tx-lbm-status	Specify that the LBM transmission is allowed or not.
false	Specify that the next LBM cannot be sent.
true	Specify that the next LBM can be sent.
bridge	Specify the ID of a bridge in the range of <1-32>.
backbone	Specify that the bridge is a backbone.

Command Mode

Interface mode

Example

```
(config)#interface eth1  
(config-if)#ethernet cfm mep 23 domain abc tx-lbm-status true bridge 1  
(config-if)#ethernet cfm mep 23 domain abc vid 3 tx-lbm-status false bridge 1
```

ethernet cfm dmm mepid

Use this command to configure two-way delay measurement (DMM) on a host MEP.

Command Syntax

```
ethernet cfm dmm mepid MEPID (unicast (rmpid MEPID)|multicast)
    duration DURATION domain DOMAIN_NAME (vlan VLAN_ID|)
    ((interval (1 | 2 | 3 | 4))|) (bridge <1-32>|)
```

Parameters

mepid	Specify the host MEP.
multicast	Specify the multicast delay measurement.
unicast	Specify the unicast delay measurement.
rmpid	Specify the MEPID of remote MEP.
duration	Specify an integer that sets the delay measurement duration <5-60>.
domain	Specify the maintenance domain name.
bridge	Specify the bridge group name used for bridging <1-32>.
interval	Specify a DMM transmission interval.
1	Specify a DM Transmission interval <100 ms>.
2	Specify a DM Transmission interval <10 ms>.
3	Specify a DM Transmission interval <1 second>.
4	Specify a DM Transmission interval <10 seconds>.
vlan	Specify the primary-VID of the MA.

Command Mode

Exec mode and Privileged Exec mode

Example

```
#ethernet cfm dmm mepid 1 multicast duration 12 domain new interval 1
```

ethernet cfm dvm mepid

Use this command to configure delay variation measurement (DVM) on a host MEP.

Command Syntax

```
ethernet cfm dvm mepid MEPID (unicast (rmpid MEPID)|multicast)
  duration DURATION domain DOMAIN_NAME (vlan VLAN_ID|)
  ((interval (1 | 2 | 3 | 4))|) (bridge <1-32>|)
```

Parameters

mepid	Specify the host MEP.
multicast	Specify the multicast delay measurement.
unicast	Specify the unicast delay measurement.
rmpid	Specify the MEPID of remote MEP.
duration	Specify an integer that sets the delay measurement duration <5-60>.
domain	Specify the maintenance domain name.
bridge	Specify an ID of a bridge <1-32>.
interval	Specify a DMM transmission interval.
1	Specify a DM Transmission interval <100 ms>.
2	Specify a DM Transmission interval <10 ms>.
3	Specify a DM Transmission interval <1 second>.
4	Specify a DM Transmission interval <10 seconds>.
vlan	Specify the primary-VID of the MA.

Command Mode

Exec mode and Privileged Exec mode

Example

```
#ethernet cfm dvm mepid 1 multicast duration 12 domain new interval 1
```

ethernet cfm exm

Use this command to configure Ethernet experimental OAM messages functionality between a host and a destination MEP in an administrative domain. ZebOS-XP handles the message part of the frame alone; in other words, ZebOS-XP can identify the frame, but does not handle the payload.

Note: Interoperability of vendor-specific OAM is not expected when using equipment from different vendors.

Command Syntax

```
ethernet cfm exm tx mepid MEPID unicast rmepid RMEPID domain DOMAIN_NAME (vlan
VLAN_ID|) (bridge <1-32>|)
```

Parameters

tx	Specify frame transmission.
mepid	Specify an integer that identifies the host MEP.
unicast	Specify that unicast frames are to be sent.
rmepid	Specify the ID of the remote MEP.
domain	Specify name of the maintenance domain.
bridge	Specify the ID of the bridge group name used for bridging <1-32>.
vlan	Specify an integer that identifies a VLAN.

Command Mode

Exec mode and Privileged Exec mode

Examples

```
#ethernet cfm exm tx mepid 3 unicast rmepid 5 domain 3 vlan 3 bridge 1
```

ethernet cfm in-service

This command is used to configure an interface for in-service or out-of-service testing.

Command Syntax

```
ethernet cfm in-service testing mep MEPID domain DOMAIN_NAME (vlan VLAN_ID|)  
    (bridge <1-32>|)
```

Parameters

testing	Specify to configure MEP for testing.
mep	Specify an integer that identifies the host MEP.
domain	Specify name of the maintenance domain.
bridge	Specify the ID of the bridge group name used for bridging <1-32>.
vlan	Specify an integer that identifies a VLAN.

Command Mode

Interface mode

Examples

```
#configure terminal  
(config)#interface eth1  
(config-if)#ethernet cfm in-service testing mep 4 domain abc vlan 3 bridge 1
```


ethernet cfm lmm mpid

Use this command to configure Loss Measurement Messages (LMM) in regards to multicast or unicast delay measurements on a MEP.

Command Syntax

```
ethernet cfm lmm mpid MEPID (unicast rmepid RMEPID | multicast) duration <5-60>
    (domain DOMAIN_NAME | level LEVEL) (vlan VLAN_ID|)
    ((interval (1 | 2 | 3 | 4))|) (bridge <1-32>|)
```

Parameters

mpid	Specify the host MEP.
multicast	Specify the multicast frame to be sent
unicast	Specify the unicast frame to be sent
rmepid	Specify the MEPID of remote MEP.
duration	Specify an integer that sets the delay measurement duration <5-60>.
domain	Specify the maintenance domain name.
level	Specify the level associated with the domain.
bridge	Specify an ID of a bridge <1-32>.
interval	Specify a DMM transmission interval.
1	Specify a DM Transmission interval <100 ms>.
2	Specify a DM Transmission interval <10 ms>.
3	Specify a DM Transmission interval <1 second>.
4	Specify a DM Transmission interval <10 seconds>.
vlan	Specify the primary-VID of the MA.

Command Mode

Exec mode and Privileged Exec mode

Examples

The following example configures LMM for MEP 6, sending multicast frames, in domain abc, for VLAN 3 and bridge 1, for a duration of 8 seconds and transmission interval of 10 seconds:

```
#ethernet cfm lmm mpid 6 multicast duration 8 domain abc vlan 3 interval 4 bridge 1
```

The following example configures LMM for MEP 5, sending multicast frames, in domain abc, for VLAN 3 and bridge 1, for a duration of 9 seconds:

```
#ethernet cfm lmm mpid 5 multicast duration 9 level 3 vlan 3 bridge 1
```

The following example configures LMM for host MEP 5, sending unicast frames to remote MEP 7, in domain abc, for VLAN 3 and bridge 1, for a duration of 10 seconds:

```
#ethernet cfm lmm mpid 5 unicast rmepid 7 duration 10 domain abc vlan 3 bridge 1
```

ethernet cfm mcc

Use this command to configure transmission of Maintenance Communication Channel (MCC) frames from the host MEP to a specified unicast address or a default multicast address for the maintenance entity group (MEG) level.

Command Syntax

```
ethernet cfm mcc tx mepid MEPID (unicast rmepid RMEPID| multicast)
    domain DOMAIN_NAME (vlan VLAN_ID|) (bridge <1-32>|)
```

Parameters

tx	Specify the MCC transmission type.
mepid	Specify an integer that identifies the host MEP.
multicast	Specify to send multicast MCC frames.
unicast	Specify to send unicast MCC frames.
rmepid	Specify an integer that identifies the remote MEP for unicast frames.
domain	Specify the name of the maintenance domain in ASCII format.
vlan	Specify an integer that identifies a VLAN.
bridge	Specify the ID of a bridge in the range of <1-32>.

Command Mode

Exec mode and Privileged Exec mode

Example

```
#ethernet cfm mcc tx mepid 5 unicast rmepid 7 domain 3 vlan 3 bridge 1
#ethernet cfm mcc tx mepid 4 multicast domain 3 vlan 3 bridge 1
```

ethernet cfm mep

Use this command to create a MEP and set it to the Up or Down state. When no primary VID is entered, the MEP uses the primary VID of the maintenance association.

Note: To create a link-level MEP, do not enter a VID in the command line.

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

Command Syntax

```
ethernet cfm mep (down|up) mpid MEPID active (true | false) domain DOMAIN_NAME
    (vlan VLANID|) (local-vid VID|) (uni-mep|) (bridge <1-32>|)

no ethernet cfm mep (down|up) mpid MEPID domain DOMAIN_NAME (vlan VLANID|)
    (local-vid VID|) (bridge <1-32>|)
```

Parameters

<code>down</code>	Specify the MEP as a down MEP.
<code>up</code>	Specify the MEP as an up MEP.
<code>mpid</code>	Enter the mepid ranging from <1-8191>
<code>active</code>	Specify the administrative state of the MEP.
<code>true</code>	Specify the state of the MEP to active.
<code>false</code>	Specify the state of the MEP to inactive.
<code>domain</code>	Specify the name of the maintenance domain in ASCII format.
<code>bridge</code>	Specify the ID of a bridge in the range of <1-32>.
<code>local-vid</code>	Specify the ID of the local VLAN.
<code>uni-mep</code>	Enter the UNI-MEG MEP to intimate the UNI type.
<code>vlan</code>	Specify the ID of a VLAN.

Command Mode

Interface mode

Example

```
(config)#interface eth1
(config-if)#ethernet cfm mep down mpid 23 active true domain abc vlan 3 bridge
1
(config-if)#ethernet cfm mep down mpid 23 active true domain abc vlan 3 local-
vid 4 bridge 1
(config-if)#ethernet cfm mep down mpid 23 active true domain abc bridge 1
(config-if)#no ethernet cfm mep down mpid 23 domain abc vlan 3 bridge 1
(config-if)#no ethernet cfm mep down mpid 23 domain abc bridge 1
```

ethernet cfm out-of-service

This command is used to configure an interface for out-of-service testing.

Command Syntax

```
ethernet cfm out-of-service lck-level LEVEL testing mep MEPID domain DOMAIN_NAME  
    (vlan VLAN_ID|) (bridge <1-32>|)
```

Parameters

lck-level	Specify the level at which LCK frames should be sent.
testing	Specify to configure MEP for testing.
mep	Specify an integer that identifies the host MEP.
domain	Specify name of the maintenance domain.
bridge	Specify the ID of the bridge group name used for bridging <1-32>.
vlan	Specify an integer that identifies a VLAN.

Command Mode

Interface mode

Examples

```
#configure terminal  
(config)#interface ethlet cfm out-of-service lck-level 4 testing mep 3 domain  
abc vlan 3 bridge 1
```

ethernet cfm pbb 1dm

Use this command to configure a host MEP to receive one-way delay-measurement (1DM) frames and specify the duration desired for frame reception.

Note: To initiate one-way delay measurement reception messages on a link-level MEP, do not enter a VLAN ID in the command line.

Command Syntax

```
ethernet cfm pbb 1dm mepid MEPID unicast rmpid MEPID duration DURATION domain-name
DOMAIN_NAME (((vlan VLAN_ID)|(isid ISID)))
((interval (1 | 2 | 3 | 4))) (bridge <1-32> | backbone)

ethernet cfm pbb 1dm mepid MEPID multicast duration DURATION
domain-name DOMAIN_NAME (((vlan VLAN_ID)|(isid ISID)))
((interval (1 | 2 | 3 | 4))) (bridge <1-32> | backbone)
```

Parameters

multicast	Configure unicast or multicast delay measurements.
unicast	Configure unicast or multicast delay measurements.
rmpid	MEPID of remote MEP
duration	The duration of the delay measurements in the range of <5-60> seconds.
domain-name	The name of the domain.
backbone	Identifies the bridge as a backbone.
bridge	An integer in this range that identifies a bridge <1-32>.
interval	DMM transmission interval
1	Set delay measurement interval to 100 milliseconds.
2	Set delay measurement interval to 10 milliseconds.
3	Set delay measurement interval to 1 second.
4	Set delay measurement interval to 10 seconds.
ISID	An integer that identifies an associated service instance.
vlan	An integer that identifies a VLAN.

Command Mode

Exec mode and Privileged Exec mode

Examples

```
#ethernet cfm pbb 1dm mepid 12 unicast rmpid 1 duration 6 domain-name new vlan
12 backbone
#ethernet cfm pbb 1dm mepid 12 multicast duration 60 domain-name new bridge 12
```

ethernet cfm pbb 1dm receive

Use this command to configure a host MEP to receive one-way delay-measurement (1DM) frames and specify the duration desired for frame reception.

Note: To initiate one-way delay measurement reception messages on a link-level MEP, do not enter a VLAN ID in the command line.

Command Syntax

```
ethernet cfm pbb 1dm receive mepid MEPID duration DURATION domain-name DOMAIN_NAME
((vlan VLAN_ID | isid ISID)|) (bridge <1-32> | backbone)
```

Parameters

mepid	The identity of the host MEP.
duration	The duration of the delay measurements in the range of <5-60> seconds.
domain-name	The name of the domain.
backbone	Identifies the bridge as a backbone.
bridge	An integer in this range that identifies a bridge <1-32>.
ISID	An integer that identifies an associated service instance.
vlan	An integer that identifies a VLAN.

Command Mode

Enable mode

Examples

```
#ethernet cfm pbb 1dm receive mepid 7 duration 10 domain-name abc vlan 8
bridge 3
#ethernet cfm pbb 1dm receive mepid 7 duration 5-60 domain-name ipi isid 7
backbone
#ethernet cfm pbb 1dm receive mepid 7 duration 5-60 domain-name ipi backbone
#ethernet cfm pbb 1dm receive mepid 7 duration 5-60 domain-name ipi bridge 3
```

ethernet cfm pbb ais interval

Use this command to set a transmission interval for the Alarm Indicator Signaling (AIS) for a MEP in the desired domain. Use with a VLAN ID or a service instance (ISID) configured on a bridge or a backbone bridge.

Command Syntax

```
ethernet cfm pbb ais interval TX_INTERVAL mpid MEPID domain-name DOMAIN_NAME ((vlan
    VLAN_ID | isid ISID) |) (bridge <1-32> | backbone)
```

Parameters

interval	AIS transmission interval, in seconds; valid values are 1 or 60.
mpid	The identity of the host MEP.
duration	The duration of the delay measurements in the range of <5-60> seconds.
domain-name	The name of the maintenance domain.
backbone	Identifies the bridge as a backbone.
bridge	An integer in this range that identifies a bridge <1-32>.
isid	An integer that identifies an associated service instance.
vlan	(Optional) An integer that identifies a VLAN.

Command Mode

Enable mode

Examples

```
#ethernet cfm pbb ais interval 60 mpid 23 domain-name abc vlan 2 bridge 1
#ethernet cfm pbb ais interval 10 mpid 22 domain-name isid backbone
```

ethernet cfm pbb ais status

Use this command to configure the status for Alarm Indicator Signaling (AIS).

Command Syntax

```
ethernet cfm pbb ais status (enable | disable) mep MEPID unicast RMEP_MAC
  domain-name DOMAIN_NAME level LEVEL ((vlan VLAN_ID | isid ISID)|)
  (bridge <1-32> | backbone )

ethernet cfm pbb ais status (enable | disable) mep MEPID multicast
  domain-name DOMAIN_NAME level LEVEL ((vlan VLAN_ID | isid ISID)|)
  (bridge <1-32> | backbone )
```

Parameters

disable	Specify to disable AIS
enable	Specify to enable AIS
mep	The identity of the host MEP.
multicast	Configure unicast or multicast delay measurements.
unicast	Configure unicast or multicast delay measurements.
RMEP_MAC	Enter the remote MEP MAC address in HHHH.HHHH.HHHH format
domain-name	The name of the domain.
level	Indicate a level at which the AIS frames have to be sent
LEVEL	Enter the level for AIS transmission
backbone	Identifies the bridge as a backbone.
bridge	An integer in this range that identifies a bridge <1-32>.
ISID	An integer that identifies an associated service instance.
vlan	An integer that identifies a VLAN.

Command Mode

Configure mode

Examples

```
#configure terminal
(config)#ethernet cfm pbb ais status enable mep 12 multicast domain-name new
level 1 backbone

(config)#ethernet cfm pbb ais status enable mep 12 unicast 1111.1111.1111
domain-name new level 1 isid 12 backbone
```

ethernet cfm pbb cc domain-name

Use this command to configure a continuity checking interval (CCI) for provider backbone bridging in a specific domain, associate it with a VLAN or service instance, and set the desired interval.

Note: To configure a CCI on a link-level MEP, do not enter a service instance in the command line.

Command Syntax

```
ethernet cfm pbb cc domain-name DOMAIN_NAME ((vlan VLAN_ID) | (isid ISID))
(interval (1 | 2 | 3 | 4 | 5 | 6 | 7)) (bridge <1-32> | backbone)
```

Parameters

vlan	An integer that identifies a VLAN.
isid	An integer that identifies an associated service instance <1-16777214>.
interval	The continuity checking interval (CCI), including:
1	Set CCI to 3 milliseconds.
2	Set CCI to 10 milliseconds.
3	Set CCI to 100 milliseconds.
4	Set CCI to 1 seconds.
5	Set CCI to 10 seconds.
6	Set CCI to 1 minute.
7	Set CCI to 10 minutes.
backbone	Identifies the bridge as a backbone.
bridge	An integer in this range that identifies a bridge <1-32>.

Command Mode

Configure mode

Examples

```
#configure terminal
(config)#ethernet cfm pbb cc domain-name ipi interval 3 bridge 2
(config)#ethernet cfm pbb cc domain-name new isid 1 interval 1 bridge 1
```

ethernet cfm pbb cc multicast

Use this command to enable or disable multicast CC for a domain with the service instance ID (ISID) or VLAN ID as identifiers.

Note: To enable or disable multicast CC on a link-level MD, do not enter a VLAN_ID in the command line. This command is only valid when HAVE_Y1731 is defined.

Syntax

```
ethernet cfm pbb cc multicast state (enable|disable) domain-name DOMAIN_NAME
mepid MEPID ((vlan VLAN_ID | isid ISID)|) (bridge <1-32> | backbone)
```

Parameters

state	Set the continuity check state
enable	Enable the continuity checking state for multicast.
disable	Disable the continuity checking state for multicast.
domain-name	The name of the maintenance domain.
mepid	Configure the mepid.
backbone	Identifies the bridge as a backbone.
bridge	An integer in this range that identifies a bridge <1-32>.
isid	An integer that identifies an associated service instance <1-16777214>.
vlan	An integer that identifies a VLAN

Command Mode

Interface mode

Examples

```
#configure terminal
(config)#interface eth1
(config-if)#ethernet cfm pbb cc multicast state enable domain-name new mepid 1
bridge 1
```

ethernet cfm pbb cc unicast

Use this command to enable or disable unicast CC for a MEP or a remote MEP using the ISID or VLAN_ID as identifiers.

Note: To enable or disable unicast CC on a link-level MD, do not enter a VLAN_ID in the command line.

Syntax

```
ethernet cfm pbb cc unicast mpid MEPID rmpid RMEPID state (enable | disable)
domain-name DOMAIN_NAME ((vlan VLAN_ID | isid ISID) | (bridge <1-32> | backbone))
```

Parameters

mpid	Identity of the source MEP (MEPID).
rmpid	Remote MEP ID (RMEPID).
state	Set the continuity check state
enable	Enable the continuity checking state for unicast.
disable	Disable the continuity checking state for unicast.
domain-name	The name of the maintenance domain.
mpid	Configure the mpid.
backbone	Identifies the bridge as a backbone.
bridge	An integer in this range that identifies a bridge <1-32>.
isid	An integer that identifies an associated service instance <1-16777214>.
vlan	An integer that identifies a VLAN

Command Mode

Interface mode

Examples

```
#configure terminal
(config)#interface eth1
(config-if)#ethernet cfm pbb cc unicast mpid 23 rmpid 3 state enable domain-
name abc vlan 3 bridge 1
(config)#ethernet cfm pbb cc unicast mpid 23 rmpid 3 state enable domain-name
abc isid 3 backbone
```

ethernet cfm pbb dmm

Use this command to configure two-way (DMM) (unicast or multicast) delay measurement messaging from the host MEP. When configuring unicast messaging, identify a unicast remote MEP. Specify the duration required and select a DMM transmission interval for the named domain, VLAN or ISID, and bridge as delimiting factors.

Note: To initiate delay measurements messaging on a link-level MEP, do not enter a VLAN_ID in the command line.

Syntax

```
ethernet cfm pbb dmm mepid MEPID unicast rmpid MEPID duration DURATION domain-name
DOMAIN_NAME (((vlan VLAN_ID)|(isid ISID)))
((interval (1 | 2 | 3 | 4))) (bridge <1-32> | backbone)

ethernet cfm pbb dmm mepid MEPID multicast duration DURATION
domain-name DOMAIN_NAME (((vlan VLAN_ID)|(isid ISID)))
((interval (1 | 2 | 3 | 4))) (bridge <1-32> | backbone)
```

Parameters

mepid	The identity of the host MEP.
multicast	Configure unicast or multicast delay measurements.
unicast	Configure unicast or multicast delay measurements.
rmpid	MEPID of remote MEP
duration	The duration of the delay measurements in the range of <5-60> seconds.
domain-name	The name of the domain.
backbone	Identifies the bridge as a backbone.
bridge	An integer in this range that identifies a bridge <1-32>.
interval	DMM transmission interval
1	Set delay measurement interval to 100 milliseconds.
2	Set delay measurement interval to 10 milliseconds.
3	Set delay measurement interval to 1 second.
4	Set delay measurement interval to 10 seconds.
ISID	An integer that identifies an associated service instance.
vlan	An integer that identifies a VLAN.

Command Mode

Enable mode

Examples

```
#ethernet cfm pbb dmm mepid 23 multicast duration 5 domain-name abc isid 3
bridge 1
#ethernet cfm pbb dmm mepid 23 unicast rmpid 1 duration 5 domain-name abc isid
3 backbone
```

ethernet cfm pbb dvm

Use this command to configure delay variation (DVM) (unicast or multicast) delay measurement messaging from the host MEP. When configuring unicast messaging, identify a unicast remote MEP. Specify the duration required and select a DMM transmission interval for the named domain, VLAN or ISID, and bridge as delimiting factors.

Note: To initiate delay measurements messaging on a link-level MEP, do not enter a VLAN_ID in the command line.

Syntax

```
ethernet cfm pbb dvm mepid MEPID unicast rmpid MEPID duration DURATION domain-name
    DOMAIN_NAME (((vlan VLAN_ID)|(isid ISID)))
    ((interval (1 | 2 | 3 | 4))) (bridge <1-32> | backbone)

ethernet cfm pbb dvm mepid MEPID multicast duration DURATION
    domain-name DOMAIN_NAME (((vlan VLAN_ID)|(isid ISID)))
    ((interval (1 | 2 | 3 | 4))) (bridge <1-32> | backbone)
```

Parameters

mepid	The identity of the host MEP.
multicast	Configure unicast or multicast delay measurements.
unicast	Configure unicast or multicast delay measurements.
rmpid	MEPID of remote MEP
duration	The duration of the delay measurements in the range of <5-60> seconds.
domain-name	The name of the domain.
backbone	Identifies the bridge as a backbone.
bridge	An integer in this range that identifies a bridge <1-32>.
interval	DMM transmission interval
1	Set delay measurement interval to 100 milliseconds.
2	Set delay measurement interval to 10 milliseconds.
3	Set delay measurement interval to 1 second.
4	Set delay measurement interval to 10 seconds.
ISID	An integer that identifies an associated service instance.
vlan	An integer that identifies a VLAN.

Command Mode

Enable mode

Examples

```
#ethernet cfm pbb dvm mepid 23 multicast duration 5 domain-name abc isid 3
bridge 1
#ethernet cfm pbb dvm mepid 23 unicast rmpid 1 duration 5 domain-name abc isid
3 backbone
```

ethernet cfm pbb exm

Use this command to enable transmission of Ethernet experimental OAM messages (EXM) from the host MEP to a remote MEP (RMEPID) for a domain. You can use a VLAN ID or service instance ID as the identifying options.

Command Syntax

```
ethernet cfm pbb exm tx mepid MEPID unicast rmepid RMEPID domain-name DOMAIN_NAME
((vlan VLAN_ID | isid ISID)|) (bridge <1-32> | backbone)
```

Parameters

tx	Frame transmission.
mepid	Identity of the source MEP (MEPID).
unicast	Send unicast frame.
rmepid	Remote MEP ID (RMEPID).
domain-name	The name of the maintenance domain.
backbone	Identifies the bridge as a backbone.
bridge	An integer in this range that identifies a bridge <1-32>.
isid	An integer that identifies an associated service instance <1-16777214>.
vlan	An integer that identifies a VLAN

Command Mode

Exec mode and Privileged Exec mode

Examples

```
#ethernet cfm pbb exm tx mepid 23 unicast rmepid 3 domain-name abc vlan 7
backbone
#ethernet cfm pbb exm tx mepid 42 unicast rmepid 3 domain-name abc backbone
```

ethernet cfm pbb in-service

Use this command to configure a MEP for in-service testing.

Command Syntax

```
ethernet cfm pbb in-service testing mep MEPID domain-name DOMAIN_NAME ((vlan
VLAN_ID) |(isid ISID))
```

Parameters

testing	Configure MEP for testing
mep	MEP on which testing is being configured
domain-name	The name of the maintenance domain.
isid	An integer that identifies an associated service instance <1-16777214>.
vlan	An integer that identifies a VLAN
backbone	Identifies the bridge as a backbone.
bridge	An integer in this range that identifies a bridge <1-32>.

Command Mode

Enable mode

Examples

```
#ethernet cfm pbb in-service testing mep 23 domain-name abc vlan 3 bridge 1
#ethernet cfm pbb in-service testing mep 12 domain-name 12 isid 1 backbone
```

ethernet cfm pbb lmm

Use this command to configure Loss Measurement Messaging (LMM) for CFM frames on the host and remote MEP specified. LMM can be configured for unicast or multicast frames, domain type (VLAN or service instance), measurement interval, and bridge type.

Note: To initiate LMM on a link-level MEP, do not enter a VLAN_ID in the command line.

Command Syntax

```
ethernet cfm pbb lmm mpid MEPID unicast rmepid RMEPID duration <5-60>
  domain-name DOMAIN_NAME ((vlan VLAN_ID | isid ISID)|)
  ((interval (1 | 2 | 3 | 4))|) (bridge <1-32> | backbone)

ethernet cfm pbb lmm mpid MEPID multicast duration <5-60> domain-name DOMAIN_NAME
  ((vlan VLAN_ID | isid ISID)|) ((interval (1 | 2 | 3 | 4))|) (bridge <1-32> |
  backbone)
```

Parameters

mpid	Identity of the source MEP (MEPID).
multicast	Set multicast as the LMM frames to be sent.
unicast	Set unicast as the LMM frames to be sent.
rmepid	ID of the remote MEP; required for unicast frames (RMEPID).
duration	The duration for which LMM should be observed, in seconds <5-60>.
domain-name	The name of the maintenance domain.
isid	An integer that identifies an associated service instance.
vlan	An integer that identifies a VLAN.
interval	The LMM transmission interval, including:
1	Set the LMM transmission interval to 100 milliseconds.
2	Set the LMM transmission interval to 10 milliseconds.
3	Set the LMM transmission interval to 1 second.
4	Set the LMM transmission interval to 10 seconds.
backbone	Identifies the bridge as a backbone.
bridge	An integer in this range that identifies a bridge <1-32>.

Command Mode

Exec mode and Privileged Exec mode

Examples

```
#ethernet cfm pbb lmm mpid 23 unicast rmepid 3 duration 10 domain-name abc
vlan 2 interval 1 bridge 1
#ethernet cfm pbb lmm mpid 23 multicast duration 5 domain-name ipi isid 3
interval 2 backbone 1
```

ethernet cfm pbb mcc

Use this command to enable Maintenance Communication Channel (MCC) message transmission (tx) from a host MEP to a remote MEP for a domain, using the VLAN ID or ISID entered as identifiers.

Command Syntax

```
ethernet cfm pbb mcc tx mepid MEPID unicast rmepid RMEPID domain-name DOMAIN_NAME
    ((vlan VLAN_ID | isid ISID)) (bridge <1-32> | backbone)

ethernet cfm pbb mcc tx mepid MEPID multicast domain-name DOMAIN_NAME
    ((vlan VLAN_ID | isid ISID)) (bridge <1-32> | backbone)
```

Parameters

tx	Frame transmission.
mepid	Identity of the source MEP (MEPID).
multicast	Set multicast as the MCC frames to be sent.
unicast	Set unicast as the MCC frames to be sent.
rmepid	ID of the remote MEP; required for unicast frames (RMEPID).
domain-name	The name of the maintenance domain.
backbone	Identifies the bridge as a backbone.
bridge	An integer in this range that identifies a bridge <1-32>.
isid	An integer that identifies an associated service instance <1-16777214>.
vlan	An integer that identifies a VLAN

Command Mode

Exec mode and Privileged Exec mode

Examples

```
#ethernet cfm pbb mcc tx mepid 22 unicast rmepid 2 domain-name ipi isid
1bridge 3
#ethernet cfm pbb mcc tx mepid 22 multicast domain-name ipi isid 1 bridge 3
```

ethernet cfm pbb mep

Use this command to create a MEP on a PBB by identifying a VLAN or service instance ID within a selected domain.

Use the `no` form of this command to delete a MEP for a PBB in a specific domain.

Note: To create and configure a link-level MEP, or to remove one, do not enter a VLAN number in the command line.

Command Syntax

```
ethernet cfm pbb mep (down|up) mpid MEPID domain-name NAME
(((vlan VLAN_ID (local-vid VID|)| isid ISID) (cbp-service-domain isid ISID |))
(bridge <1-32> | backbone)

no ethernet cfm pbb mep (down|up) mpid MEPID domain-name NAME
(((vlan VLAN_ID (local-vid VID|)| isid ISID) (cbp-service-domain isid ISID |))
(bridge <1-32> | backbone)
```

Parameters

<code>down</code>	Set the MEP's direction of flow to DOWN.
<code>up</code>	Set the MEP's direction of flow to UP.
<code>mpid</code>	Identity of the source MEP.
<code>domain-name</code>	The name of the maintenance domain.
<code>isid</code>	An integer that identifies an associated service instance <1-16777214>.
<code>cbp-service-domain</code>	ISID for MEP at the CBP in a service domain
<code>isid</code>	Set how MEP handles the CBP ISIDs on the interface for the domain
<code>vlan</code>	An integer that identifies a VLAN
<code>local-vid</code>	Set the local vid for the mep, should be a secondary vid for the MA
<code>VID</code>	Enter the local-vid for the mep
<code>cbp-service-domain</code>	ISID for MEP at the CBP in a service domain
<code>backbone</code>	Identifies the bridge as a backbone.
<code>bridge</code>	An integer in this range that identifies a bridge <1-32>.

Command Mode

Interface mode

Examples

```
(config)#interface eth1
(config-if)#ethernet cfm pbb mep down mpid 23 domain-name abc bridge 1

(config-if)#ethernet cfm pbb mep down mpid 23 domain-name abc vlan 3 backbone

(config-if)#ethernet cfm pbb mep up mpid 2 domain-name ab isid 3 bridge 1
```

ethernet cfm pbb out-of-service

Use this command to configure a MEP for out-of-service testing.

Note: To configure a MEP for out-of-service testing on a link-level, do not enter a VLAN_ID in the command line.

Command Syntax

```
ethernet cfm pbb out-of-service lck-level LEVEL testing mep MEPID domain-name  
DOMAIN_NAME ((vlan VLAN_ID)|(isid ISID))
```

Parameters

lck-level	The level at which LCK frames should be sent.
testing	Configure MEP for testing
mep	MEP on which testing is being configured
domain-name	The name of the maintenance domain.
isid	An integer that identifies an associated service instance <1-16777214>.
vlan	An integer that identifies a VLAN
backbone	Identifies the bridge as a backbone.
bridge	An integer in this range that identifies a bridge <1-32>.

Command Mode

Enable mode

Examples

```
#ethernet cfm pbb out-of-service lck-level 4 testing mep 23 domain-name abc  
vlan 3 bridge 1  
#ethernet cfm pbb out-of-service lck-level 2 testing mep 23 domain-name abc  
vlan 3 backbone
```

ethernet cfm pbb throughput-measurement

Use this command to create two different types of configurations:

1. Enable reception of test (TST) frames for throughput measurement for the host MEP, and set a transmission duration in the domain and VLAN, or service instance specified.
2. Configure throughput-measurement unicast TST frames from the host MEP to the RMEP for the ISID or VLAN in a specified domain.

Note: To configure TST frames for throughput measurement on a link-level MEP, do not enter a VLAN_ID in the command line.

Command Syntax

```
ethernet cfm pbb throughput-measurement unicast mepid MEPID rmepid RMEPID
  domain-name DOMAIN_NAME (vlan VLAN_ID)|(isid ISID) (bridge <1-32>|backbone)

ethernet cfm pbb throughput-measurement reception mepid MEPID duration <1-10>
  domain-name DOMAIN_NAME ((vlan VLAN_ID)|(isid ISID)) (bridge <1-32> | backbone)
```

Parameters

reception	Enable reception of TST frames for throughput measurement
unicast	Specify that unicast TST frames are to be sent
mepid	Identity of the host MEP.
duration	Maximum duration to wait for TST frames before timing out, in the range of <1-10> seconds.
domain-name	The name of the maintenance domain.
backbone	Identifies the bridge as a backbone.
bridge	An integer in this range that identifies a bridge <1-32>.
isid	An integer that identifies an associated service instance.
vlan	An integer that identifies a VLAN.

Command Mode

Enable mode

Examples

```
#ethernet cfm pbb throughput-measurement reception mepid 1 duration 1 domain-
name new vlan 1 backbone

#ethernet cfm pbb throughput-measurement unicast mepid 32 rmepid 5 domain-name
abc vlan 7
```

ethernet cfm pbb tst

This command configures a CFM test signal from the host MEP to a remote unicast or multicast MEP and specifies a test pattern for a domain, service instance or VLAN. Frames can be sent recursively to a remote MEP for a duration. To initiate TST signals from a link-level MEP, do not enter a VLAN_ID in the command line.

Command Syntax

```
ethernet cfm pbb tst mep MEPID unicast RMEPID pattern (1 | 2 | 3 | 4)
    domain-name DOMAIN_NAME ((vlan VLAN_ID | isid ISID)|)
    (recursive duration <5-60> interval TX_INTERVAL|)
    (lck interval TX_INTERVAL (unicast rmepid RMEPID | multicast)|)
    (bridge <1-32> | backbone)

ethernet cfm pbb tst mep MEPID multicast pattern (1 | 2 | 3 | 4)
    domain-name DOMAIN_NAME ((vlan VLAN_ID | isid ISID)|)
    (recursive duration <5-60> interval TX_INTERVAL|)
    (lck interval TX_INTERVAL (unicast rmepid RMEPID | multicast)|)
    (bridge <1-32> | backbone)
```

Parameters

mep	Identity of the host MEP.
multicast	Send unicast or multicast test frame
unicast	Send unicast or multicast test frame
rmepid	Identity of the remote MEP.
pattern	Test pattern to be sent, including:
1	Test Pattern- abc.
2	Test Pattern- 1234.
3	Test Pattern- a1b2c.
4	Test Pattern- 1a2b3c.
domain-name	The name of the maintenance domain.
backbone	Identifies the bridge as a backbone.
bridge	An integer in this range that identifies a bridge <1-32>.
isid	An integer that identifies an associated service instance.
lck	Send lock (LCK) frame in the opposite direction for out-of-service testing
recursive	Recursively send TST frames.
vlan	An integer that identifies a VLAN.
interval	The transmission interval value for test frames in the range of <1-10> seconds. If no range is specified, 1 second is set as the default.
multicast	multicast LCK frame to be sent
unicast	unicast LCK frame to be sent
rmepid	remote mep id for LCK
duration	Number of seconds for which test frames are sent within this range.

Note: The value for LCK frame transmission interval should be the same as the AIS transmission interval.

Command Mode

Enable mode

Examples

```
#ethernet cfm pbb tst mep 3 multicast pattern 1 domain-name abc isid 3  
recursive duration 5 interval 10 lck interval 1 multicast backbone
```

```
#ethernet cfm pbb tst mep 12 unicast 12 pattern 1 domain-name new recursive  
duration 8 interval 9 lck interval 9 multicast backbone
```

```
#ethernet cfm pbb tst mep 12 multicast pattern 1 domain-name new isid 12 lck  
interval 12 multicast bridge 1
```

```
#ethernet cfm pbb tst mep 12 multicast pattern 1 domain-name new vlan 6 lck  
interval 7 multicast backbone
```

ethernet cfm pbb vsm

Use this command to enable transmission of vendor-specific OAM messages (VSM) from the host MEP to a remote MEP (RMEPID) for a domain. You can use a VLAN ID or service instance ID as the identifying options.

Command Syntax

```
ethernet cfm pbb vsm tx mepid MEPID unicast rmepid RMEPID domain-name DOMAIN_NAME
((vlan VLAN_ID | isid ISID) | (bridge <1-32> | backbone))
```

Parameters

tx	Frame transmission.
mepid	Identity of the source MEP (MEPID).
unicast	Send unicast frame.
rmepid	Remote MEP ID (RMEPID).
domain-name	The name of the maintenance domain.
backbone	Identifies the bridge as a backbone.
bridge	An integer in this range that identifies a bridge <1-32>.
isid	An integer that identifies an associated service instance <1-16777214>.
vlan	An integer that identifies a VLAN

Command Mode

Exec mode and Privileged Exec mode

Examples

```
#ethernet cfm pbb vsm tx mepid 23 unicast rmepid 3 domain-name abc vlan 7
backbone
#ethernet cfm pbb vsm tx mepid 42 unicast rmepid 3 domain-name abc backbone
```

ethernet cfm pbb-te 1dm mepid

Use this command to configure one-way delay measurement (1DM) on a host MEP, select unicast or multicast frames, set the measurement duration, and associate the host MEP to an MD and a TE service instance.

Command Syntax

```
ethernet cfm pbb-te 1dm mepid MEPID (unicast (rmpid MEPID) | multicast) duration
    DURATION domain-name DOMAIN_NAME te-sid TE_SID ((interval (1 | 2 | 3 | 4)))
    bridge backbone
```

Parameters

mepid	Identity of the host MEP
multicast	Specify that multicast frames should be sent
unicast	Specify that unicast frames should be sent
rmpid	ID of the remote MEP for unicast frames
duration	Duration for which LMM should be observed in the range of <5-60> seconds
domain-name	Name of the maintenance domain
te-sid	TE service instance ID
interval	Set the Data Measurement Message transmission interval, including:
1	Set the DM transmission interval to 100 milliseconds
2	Set the DM transmission interval to 10 milliseconds
3	Set the DM transmission interval to 1 second
4	Set the DM transmission interval to 10 seconds
bridge	Identify a bridge group name.
backbone	Specify a backbone bridge

Command Mode

Exec Mode and Privileged Exec Mode

Examples

```
#ethernet cfm pbb-te 1dm mepid 23 multicast duration 5 domain-name abc te-sid
3 bridge backbone
```

ethernet cfm pbb-te 1dm receive

Use this command to configure reception of one-way delay measurement (1DM) frames for the source MEP, set the duration, and associate the MEP to an MD and a TE service instance.

Command Syntax

```
ethernet cfm pbb-te 1dm receive mepid MEPID duration DURATION domain-name  
DOMAIN_NAME te-sid TE_SID bridge backbone
```

Parameters

mepid	Identity of the host MEP
duration	Duration for which LMM should be observed in the range of <5-60> seconds
domain-name	Name of the maintenance domain
te-sid	TE service instance ID
bridge	Identify a bridge group name.
backbone	Specify a backbone bridge

Command Mode

Exec Mode and Privileged Exec Mode

Examples

```
#ethernet cfm pbb-te 1dm receive mepid 7 duration 10 domain-name abc te-sid 8  
bridge backbone  
#ethernet cfm pbb-te 1dm receive mepid 7 duration 5 domain-name ipi te-sid 7  
bridge backbone
```

ethernet cfm pbb-te ais interval

Use this command to set the AIS transmission interval. Enter a transmission interval in the range of 1 to 60 seconds.

Command Syntax

```
ethernet cfm pbb-te ais interval TX_INTERVAL mpid MEPID domain-name DOMAIN_NAME  
te-sid TE_SID bridge backbone
```

Parameters

mpid	Identity of the host MEP ID
domain-name	Name of the maintenance domain
te-sid	TE service instance ID
bridge	Identify a bridge group name.
backbone	Specify a backbone bridge

Command Mode

Exec Mode and Privileged Exec Mode

Example

```
#ethernet cfm pbb-te ais interval 1 mpid 2 domain-name ipi te-sid 4 bridge  
backbone
```

ethernet cfm pbb-te ais status

Use this command to enable or disable AIS frame transmission for a MEP. AIS frames are triggered by Ethernet down events. Unicast AIS events can be monitored if the MAC address of the remote MEP is provisioned locally.

An internal counter is maintained for each AIS instance that is running. The maximum number of instances supported is eight.

Command Syntax

```
ethernet cfm pbb-te ais status (enable | disable) mep MEPID (unicast RMEP_MAC |
multicast) domain-name DOMAIN_NAME level LEVEL te-sid TE_SID bridge backbone
```

Parameters

status	Indicate the status of a signal
enable	Enable AIS frame monitoring
disable	Disable AIS frame monitoring
mep	Specify the host MEP.
multicast	Specify the multicast ais frame to be sent
unicast	Specify the unicast ais frame to be sent
RMEP_MAC	Specify a remote MEP MAC address in the format HHHH.HHHH.HHHH.
domain-name	Specify the name of the domain.
level	Specify the level for AIS transmission.
te-sid	Set a level at which AIS is associated. Enter the TES ID ranging from <1-42949675>
bridge	Identify a bridge group name.
backbone	Specify a backbone bridge

Command Mode

Configure mode

ExampleS

This example enables AIS status on mep 5 for unicast frames at the specified MAC address in domain abc, at level 3, for VLAN 3 and bridge 1:

```
(config)#ethernet cfm pbb-te ais status enable all mep 5 domain new level 1
unicast 2222.1111.432a vlan 3 bridge 1
```

ethernet cfm pbb-te cc multicast

Use this command to enable multicast continuity checking.

Command Syntax

```
ethernet cfm pbb-te cc multicast state (enable|disable) domain-name DOMAIN_NAME
te-sid TE_SID bridge backbone
```

Parameters

state	Set the continuity check state.
disable	Disable the continuity checking state for multicast.
enable	Enable the continuity checking state for multicast.
domain-name	Associate a domain name.
te-sid	Set a level at which AIS is associated. Enter the TES ID ranging from <1-42949675>
bridge	Identify a bridge group name.
backbone	Specify a backbone bridge.

Command Mode

Interface mode

Example

```
#configure terminal
(config)#ethernet cfm pbb-te cc multicast enable domain-name ipi te-sid 3
bridge backbone
```

ethernet cfm pbb-te cc unicast

Use this command to enable or disable Point-to-Point (unicast) CCM between a host MEP and a remote MEP in a PBB-TE MD.

Command Syntax

```
ethernet cfm pbb-te cc unicast mpid MEPID rmpid RMEPID state (enable | disable)
domain-name DOMAIN_NAME te-sid TE_SID bridge backbone
```

Parameters

mpid	Source MEP ID
rmepid	Remote MEP ID
state	Set the continuity check state.
disable	Disable the continuity checking state for multicast.
enable	Enable the continuity checking state for multicast.
domain-name	Associate a domain name.
te-sid	Set a level at which AIS is associated. Enter the TES ID ranging from <1-42949675>
bridge	Identify a bridge group name.
backbone	Specify a backbone bridge.

Command Mode

Configure mode

Example

```
#configure terminal
(config)#ethernet cfm pbb-te cc unicast mpid 12 rmpid 12 state enable domain-
name new te-sid 12 bridge backbone
```

ethernet cfm pbb-te dmm

Use this command to configure two-way delay measurement (DMM) on a host MEP, select unicast or multicast frames, set the measurement duration, and associate the host MEP to an MD and a TE service instance.

Command Syntax

```
ethernet cfm pbb-te dmm mepid MEPID (unicast (rmpid MEPID) | multicast) duration
    DURATION domain-name DOMAIN_NAME te-sid TE_SID ((interval (1 | 2 | 3 | 4)))
    bridge backbone
```

Parameters

mepid	Identity of the host MEP
multicast	Specify that multicast frames should be sent
unicast	Specify that unicast frames should be sent
rmpid	ID of the remote MEP for unicast frames
duration	Duration for which LMM should be observed in the range of <5-60> seconds
domain-name	Name of the maintenance domain
te-sid	TE service instance ID
interval	Set the Data Measurement Message transmission interval, including:
1	Set the DM transmission interval to 100 milliseconds
2	Set the DM transmission interval to 10 milliseconds
3	Set the DM transmission interval to 1 second
4	Set the DM transmission interval to 10 seconds
bridge	Identify a bridge group name.
backbone	Specify a backbone bridge

Command Mode

Exec Mode and Privileged Exec Mode

Examples

```
#ethernet cfm pbb-te dmm mepid 23 multicast duration 5 domain-name abc te-sid
3 bridge backbone
```

ethernet cfm pbb-te dvm

Use this command to configure delay-variation measurement (DVM) on a host MEP, select unicast or multicast frames, set the measurement duration, and associate the host MEP to an MD and a TE service instance.

Command Syntax

```
ethernet cfm pbb-te dvm mepid MEPID (unicast (rmpid MEPID) | multicast) duration
    DURATION domain-name DOMAIN_NAME te-sid TE_SID ((interval (1 | 2 | 3 | 4)))
    bridge backbone
```

Parameters

mepid	Identity of the host MEP
multicast	Specify that multicast frames should be sent
unicast	Specify that unicast frames should be sent
rmpid	ID of the remote MEP for unicast frames
duration	Duration for which LMM should be observed in the range of <5-60> seconds
domain-name	Name of the maintenance domain
te-sid	TE service instance ID
interval	Set the Data Measurement Message transmission interval, including:
1	Set the DM transmission interval to 100 milliseconds
2	Set the DM transmission interval to 10 milliseconds
3	Set the DM transmission interval to 1 second
4	Set the DM transmission interval to 10 seconds
bridge	Identify a bridge group name.
backbone	Specify a backbone bridge

Command Mode

Exec Mode and Privileged Exec Mode

Examples

```
#ethernet cfm pbb-te dvm mepid 23 multicast duration 5 domain-name abc te-sid
3 bridge backbone
```

ethernet cfm pbb-te exm

Use this command to configure Ethernet experimental OAM messaging (EXM) functionality between a host and a destination MEP.

Command Syntax

```
ethernet cfm pbb-te exm tx mepid MEPID unicast rmepid RMEPID domain-name  
DOMAIN_NAME te-sid TE_SID bridge backbone
```

Parameters

tx	Specify frame transmission.
mepid	Specify an integer that identifies the host MEP.
unicast	Specify that unicast frames are to be sent.
rmepid	Specify the ID of the remote MEP.
domain-name	Specify name of the maintenance domain.
te-sid	TE service instance ID
bridge	Identify a bridge group name.
backbone	Specify a backbone bridge

Command Mode

Exec Mode and Privileged Exec Mode

Example

```
#ethernet cfm pbb-te exm tx mepid 12 unicast rmepid 12 domain-name 12 te-sid  
12 bridge backbone
```

ethernet cfm pbb-te in-service

Use this command to configure a TESI for in-service testing.

Command Syntax

```
ethernet cfm pbb-te in-service testing mep MEPID domain-name DOMAIN_NAME te-sid  
TE_SID bridge backbone
```

Parameters

testing	Set to configure MEP for testing
mep	Identity of the MEP configured for testing
domain-name	Specify name of the maintenance domain.
te-sid	TE service instance ID
bridge	Identify a bridge group name.
backbone	Specify a backbone bridge

Command Mode

Exec Mode and Privileged Exec Mode

Example

```
#ethernet cfm pbb-te in-service testing mep 12 domain-name new te-sid 12  
bridge backbone
```

ethernet cfm pbb-te lmm

Use this command to configure unicast or multicast Loss Measurement Messaging (LMM) between a source MEP and a TESI in the in the PBB-TE domain.

Command Syntax

```
ethernet cfm pbb-te lmm mpid MEPID (unicast rmepid RMEPID | multicast) duration <5-60> domain-name DOMAIN_NAME te-sid TE_SID (interval (1 | 2 | 3 | 4)) bridge backbone
```

Parameters

mpid	Identity of the host MEP
multicast	Specify that multicast frames should be sent
unicast	Specify that unicast frames should be sent
rmepid	ID of the remote MEP for unicast frames
duration	Duration for which LMM should be observed in the range of <5-60> seconds
domain-name	Specify name of the maintenance domain.
te-sid	TE service instance ID
interval	Set the Loss Measurement Message transmission interval, including:
1	Set the LM transmission interval to 100 milliseconds
2	Set the LM transmission interval to 10 milliseconds
3	Set the LM transmission interval to 1 second
4	Set the LM transmission interval to 10 seconds
bridge	Identify a bridge group name.
backbone	Specify a backbone bridge

Command Mode

Exec Mode and Privileged Exec Mode

Examples

```
#ethernet cfm pbb-te lmm mpid 23 unicast rmepid 3 duration 10 domain-name abc te-sid 1 interval 1 bridge backbone
```

ethernet cfm pbb-te mcc

Use this command to configure transmission of multicast or unicast Maintenance Communication Channel (MCC) frames.

Command Syntax

```
ethernet cfm pbb-te mcc tx mepid MEPID (unicast rmepid RMEPID| multicast) domain-  
name DOMAIN_NAME te-sid TE_SID bridge backbone
```

Parameters

tx	Specify frame transmission.
mepid	Specify an integer that identifies the host MEP.
multicast	Specify that multicast MCC frame are to be sent
unicast	Specify that unicast MCC frame are to be sent
rmepid	Specify the ID of the remote MEP.
domain-name	Specify name of the maintenance domain.
te-sid	TE service instance ID
bridge	Identify a bridge group name.
backbone	Specify a backbone bridge

Command Mode

Exec Mode and Privileged Exec Mode

Example

```
#ethernet cfm pbb-te mcc tx mepid 10 unicast rmepid 12 domain-name DOMAIN_NAME  
te-sid 12 bridge backbone
```

ethernet cfm pbb-te mep

Use this command to configure a PBB-TE MEP as either up or down on an interface.

Use the `no` form of the command to remove the MEP association.

Command Syntax

```
ethernet cfm pbb-te mep (down|up) mpid MEPID domain-name DOMAIN_NAME te-sid TESID
    bridge backbone

no ethernet cfm pbb-te mep (down|up) mpid MEPID domain-name DOMAIN_NAME
    te-sid TE_SID bridge backbone
```

Parameters

<code>down</code>	Indicate a down MEP
<code>up</code>	Indicate an up MEP
<code>mpid</code>	Configure a MEP ID
<code>domain-name</code>	Specify name of the maintenance domain.
<code>te-sid</code>	TE service instance ID
<code>bridge</code>	Identify a bridge group name.
<code>backbone</code>	Specify a backbone bridge

Command Mode

Interface mode

Examples

```
#configure terminal
#interface cbp.1
(config-if)#ethernet cfm pbb-te mep up mpid 2 domain-name ipi te-sid 3 bridge
backbone
```

ethernet cfm pbb-te out-of-service

Use this command to configure a TESI for out-of-service testing.

Command Syntax

```
ethernet cfm pbb-te out-of-service lck-level LEVEL testing mep MEPID domain-name  
DOMAIN_NAME te-sid TE_SID bridge backbone
```

Parameters

lck-level	Level at which LCK frames are to be generated
LEVEL	Enter the LCK level
testing	Set to configure MEP for testing
mep	Identity of the MEP configured for testing
domain-name	Specify name of the maintenance domain.
te-sid	TE service instance ID
bridge	Identify a bridge group name.
backbone	Specify a backbone bridge

Command Mode

Exec Mode and Privileged Exec Mode

Example

```
#ethernet cfm pbb-te out-of-service lck-level 4 testing mep 10 domain-name abc  
te-sid 23 bridge backbone
```

ethernet cfm pbb-te throughput-measurement reception

Use this command to enable throughput-measurement reception for an MD and an MA.

Command Syntax

```
ethernet cfm pbb-te throughput-measurement reception mepid MEPID duration <1-10>
domain-name DOMAIN_NAME te-sid TE_SID bridge backbone
```

Parameters

mepid	An integer that identifies the host MEP
duration	Maximum duration of wait time for test (TST) frames before timing out <1-10>.
domain-name	Name of the maintenance domain
te-sid	TE service instance ID
bridge	Identify a bridge group name.
backbone	Specify a backbone bridge

Command Mode

Exec Mode and Privileged Exec Mode

Example

```
#ethernet cfm pbb-te throughput-measurement reception mepid 10 duration 1
domain-name abc te-sid 12 bridge backbone
```

ethernet cfm pbb-te throughput-measurement unicast

Use this command to configure throughput measurement frames from a host to a remote MEP.

Throughput is defined as the maximum rate of frame transmission at which no frame is dropped. Throughput can be measured by sending frames at an increasing rate (up to a theoretical maximum), graphing the percentage of frames received, and reporting the rate at which frames start being dropped. The rate is dependent on the frame size. Unicast Ethernet loopback (ETH-LB) or Ethernet Test (ETH-TST) frames, with the data field, can be used for throughput measurements.

Command Syntax

```
ethernet cfm pbb-te throughput-measurement unicast mepid MEPID rmepid RMEPID  
domain-name DOMAIN_NAME te-sid TE_SID bridge backbone
```

Parameters

mepid	An integer that identifies the host MEP
rmepid	An integer that identifies the remote MEP
domain-name	Name of the maintenance domain
te-sid	TE service instance ID
bridge	Identify a bridge group name.
backbone	Specify a backbone bridge

Command Mode

Exec Mode and Privileged Exec Mode

Example

```
#ethernet cfm pbb-te throughput-measurement unicast mepid 10 rmepid 20 domain-  
name abc te-sid 10 bridge backbone
```

ethernet cfm pbb-te tst mep

Use this command to send a unicast or multicast test (TST) frame with a selected pattern. For unicast, the test frame is sent to a designated MEP. When the `recursive` option is chosen, periodic test frames are sent. Otherwise, only a single test frame is sent. A test frame alone or a TST and lock (LCK) frame can be sent.

Command Syntax

```
ethernet cfm pbb-te tst mep MEPID (unicast RMEPID | multicast) pattern (1 | 2 | 3 |
4) domain-name DOMAIN_NAME te-sid TE_SID (recursive duration <5-60> interval
TX_INTERVAL|) (lck interval TX_INTERVAL (unicast rmepid RMEPID | multicast)|)
bridge backbone
```

Parameters

mep	Identity of the host MEP.
multicast	Send unicast or multicast test frame
unicast	Send unicast or multicast test frame
rmepid	Identity of the remote MEP.
pattern	Test pattern to be sent, including:
1	Test Pattern- abc.
2	Test Pattern- 1234.
3	Test Pattern- a1b2c.
4	Test Pattern- 1a2b3c.
domain-name	The name of the maintenance domain.
te-sid	TE service instance ID
lck	Send lock (LCK) frame in the opposite direction for out-of-service testing
recursive	Recursively send TST frames.
interval	The transmission interval value for test frames in the range of <1-10> seconds. If no range is specified, 1 second is set as the default.
multicast	multicast LCK frame to be sent
unicast	unicast LCK frame to be sent
rmepid	remote mep id for LCK
duration	Number of seconds for which test frames are sent within this range.
bridge	Identify a bridge group name.
backbone	Specify a backbone bridge

Note: The value for LCK frame transmission interval should be the same as the AIS transmission interval.

Command Mode

Exec mode and Privileged Exec mode

Examples

```
#ethernet cfm pbb-te tst mep new multicast pattern 1 domain-name new te-sid 1
bridge backbone
```



```
#ethernet cfm pbb-te ts mep mul multicast pattern 1 domain-name new te-sid 12  
lck interval 1 unicast rmepid 1 bridge backbone
```

```
#ethernet cfm pbb-te ts mep mul multicast pattern 1 domain-name new te-sid 1  
recursive duration 5 interval 1 lck interval 1 unicast rmepid 12 bridge  
backbone
```

ethernet cfm pbb-te vsm

Use this command to configure vendor-specific (VSM) OAM functionality between a host and a destination MEP.

Command Syntax

```
ethernet cfm pbb-te vsm tx mepid MEPID unicast rmepid RMEPID domain-name  
DOMAIN_NAME te-sid TE_SID bridge backbone
```

Parameters

tx	Specify frame transmission.
mepid	Specify an integer that identifies the host MEP.
unicast	Specify that unicast frames are to be sent.
rmepid	Specify the ID of the remote MEP.
domain-name	Specify name of the maintenance domain.
te-sid	TE service instance ID
bridge	Identify a bridge group name.
backbone	Specify a backbone bridge

Command Mode

Exec Mode and Privileged Exec Mode

Example

```
#ethernet cfm pbb-te vsm tx mepid 23 unicast rmepid 3 domain-name abc te-sid  
12 bridge backbone
```

ethernet cfm throughput-measurement reception

Use this command to enable throughput-measurement reception at the receiving MEP.

Command Syntax

```
ethernet cfm throughput-measurement reception mepid MEPID duration <1-10> domain  
DOMAIN_NAME (vlan VLAN_ID|) (bridge <1-32>|)
```

Parameters

mepid	Specify an integer that identifies the host MEP.
duration	Specify the maximum duration for waiting for TST frames before timing out <1-10>.
domain	Specify the name of the maintenance domain in ASCII format.
vlan	Specify an integer that identifies a VLAN.
bridge	Specify ID of a bridge in the range of <1-32>.

Command Mode

Exec mode and Privileged Exec mode

Example

```
#ethernet cfm throughput-measurement reception mepid 4 duration 5 domain 3  
vlan 3 bridge 1
```

ethernet cfm throughput-measurement unicast

Use this command to configure frame throughput from a host MEP to a remote MEP.

Throughput is defined as the maximum rate of frame transmission at which no frame is dropped. Throughput can be measured by sending frames at an increasing rate (up to a theoretical maximum), graphing the percentage of frames received, and reporting the rate at which frames start being dropped. In general, this rate is dependent on the frame size. Unicast Ethernet loopback (ETH-LB) or Ethernet Test (ETH-TST) frames, with the data field, can be used for performing throughput measurements.

Command Syntax

```
ethernet cfm throughput-measurement unicast mepid MEPID rmepid RMEPID  
domain DOMAIN_NAME (vlan VLAN_ID|) (bridge <1-32>|)
```

Parameters

mepid	Specify an integer that identifies the host MEP.
rmepid	Specify an integer that identifies the remote MEP for unicast frames.
domain	Specify the name of the maintenance domain in ASCII format.
vlan	Specify an integer that identifies a VLAN.
bridge	Specify ID of a bridge in the range of <1-32>.

Command Mode

Exec mode and Privileged Exec mode

Example

```
#ethernet cfm throughput-measurement unicast mepid 4 rmepid 5 domain 3 vlan 3  
bridge 1
```

ethernet cfm tst

Use this command to send a unicast or multicast test (TST) frame with a selected pattern. For unicast, the test frame is sent to a designated MEP. When the `recursive` option is chosen, periodic test frames are sent. Otherwise, only a single test frame is sent.

Command Syntax

```
ethernet cfm tst mep MEPID unicast RMEPID pattern (1 | 2 | 3 | 4) domain DOMAIN_NAME
((vlan VLAN_ID | isid ISID)) (recursive duration <5-60> interval TX_INTERVAL))
(lck interval TX_INTERVAL (unicast rmepid RMEPID | multicast))
(bridge <1-32> | backbone)

ethernet cfm tst mep MEPID multicast pattern (1 | 2 | 3 | 4) domain DOMAIN_NAME
((vlan VLAN_ID | isid ISID)) (recursive duration <5-60> interval TX_INTERVAL))
(lck interval TX_INTERVAL (unicast rmepid RMEPID | multicast))
(bridge <1-32> | backbone)
```

Parameters

mep	Specify an integer that identifies the host MEP.
multicast	Specify multicast TST frames.
unicast	Specify unicast TST frames.
rmepid	Specify the remote MEP (required for unicast).
pattern	Specify the test pattern to be sent, including:
1	Specify the test pattern as abc.
2	Specify the test pattern as 1234.
3	Specify the test pattern as a1b2c.
4	Specify the test pattern as 1a2bc3.
domain	Specify the name of the maintenance domain.
bridge	Specify the bridge on which traceroute cache is enabled, in the range of <1-32>.
backbone	Specify the bridge to be backbone.
isid	Specify the service instance ID to which it is associated.
lck	Specify that lock frames to be sent in opposite direction for out-of-service testing frames.
multicast	Specify to send multicast LCK.
unicast	Specify to send unicast LCK.
rmepid	Specify the integer that identifies the remote MEP.
recursive	Specify to send TST frames recursively.
duration	Specify the duration for which TST frames are to be sent in the range of <5-60> seconds.
interval	Specify the transmission interval for LCK frames; value should be the same as AIS TX interval, either 1 or 60 seconds.
vlan	Specify the integer that identifies a VLAN.

Command Mode

Exec mode and Privileged Exec mode

Examples

```
#ethernet cfm tst mep 6 multicast pattern 4 domain 3 vlan 3 bridge 1
#ethernet cfm tst mep 6 multicast pattern 4 domain 3 vlan 3 lck interval 1
multicast bridge 1
```

ethernet cfm vsm

Use this command to configure the vendor-specific VSM OAM functionality between a host and a destination MEP in an administrative domain. The implementation handles the message part of the frame alone; in other words, it is capable of identifying the frame, but it does not handle the payload.

Note: Interoperability of vendor-specific OAM is not expected when using equipment from different vendors.

Command Syntax

```
ethernet cfm vsm tx mepid MEPID unicast rmepid RMEPID domain DOMAIN_NAME (vlan
    VLAN_ID|) (bridge <1-32>|)
```

Parameters

tx	Specify frame transmission.
mepid	Specify an integer that identifies the host MEP.
unicast	Specify that unicast frames are to be sent.
rmepid	Specify the ID of the remote MEP.
domain	Specify name of the maintenance domain.
vlan	Specify an integer that identifies a VLAN.
bridge	Specify the ID of the bridge group name used for bridging <1-32>.

Command Mode

Exec mode and Privileged Exec mode

Examples

```
#ethernet cfm vsm tx mepid 3 unicast rmepid 8 domain 3 vlan 3
```

snmp restart cfm_v1

Use this command to restart SNMP in Connectivity Fault Management (CFM) version1

Command Syntax

```
snmp restart cfm_v1
```

Parameters

None

Command Mode

Configure mode

Examples

```
#snmp restart cfm_v1
```


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