



# Carrier Ethernet Commands

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# ais

To enable the Alarm Indication Signal (AIS) function for a specific maintenance association, use the **ais** command in Ethernet CFM service configuration mode. To disable AIS configuration, use the **no** form of this command.

**ais** [**expiry-threshold** *threshold* | **level** *level-id* | **period** *seconds* | **suppress-alarms**]

**no ais** [**expiry-threshold** | **level** | **period** | **suppress-alarms**]

## Syntax Description

<b>expiry-threshold</b>	(Optional) Configures the expiry threshold.
<i>threshold</i>	(Optional) Integer from 2 to 255 that is a count. If no MEPs are received within an interval of the threshold multiplied by the transmission period, the MEP clears the AIS defect condition. The default is 3.5.
<b>level</b>	(Optional) Indicates a maintenance level where AIS frames for maintenance endpoints (MEPs) belonging to the service will be sent.
<i>level-id</i>	(Optional) Integer from 0 to 7 that identifies the maintenance level.
<b>period</b>	(Optional) Configures the AIS transmission period for all MEPs in the maintenance association.
<i>seconds</i>	(Optional) Integer value 1 or 60 that indicates the AIS transmission period in seconds. The default is 60.
<b>suppress-alarms</b>	(Optional) Configures alarm suppression.

## Command Default

The AIS function is enabled on specific maintenance associations.

## Command Modes

Ethernet CFM service configuration (config-ecfm-srv)

## Command History

Release	Modification
15.0(1)XA	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.

## Usage Guidelines

Alarms are suppressed when a MEP goes into an RX AIS (receipt of an AIS frame) defect condition. When you specify the **level** keyword with the **ais** command, you can transmit AIS messages to a higher maintenance association without configuring a maintenance intermediate point (MIP) for that maintenance association.

Output of the **show running all** command shows “ais expiry-threshold 3.5” when the default expiry threshold is configured, “ais period 60” when the default transmission period is configured, and “no ais suppress-alarms” when the default value for the **suppress-alarms** option is configured.

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**Examples**

The following example shows how to enable the AIS function at level 5 with a transmission period of one second:

```
Router(config)# ethernet cfm domain operatorA level 5
Router(config-ecfm)# service vlan-id 10 port
Router(config-ecfm-srv)# ais period 1
Router(config-ecfm-srv)# ais level 5
```

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**Related Commands**

Command	Description
<b>show running all</b>	Displays the running configuration with default values.

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# alarm

To configure an alarm when fault alarms are enabled, use the **alarm** command in Ethernet connectivity fault management (CFM) interface configuration mode. To remove the configuration, use the **no** form of this command.

```
alarm {delay mseconds | notification {all | error-xcon | mac-remote-error-xcon | none |
remote-error-xcon | xcon} | reset mseconds}
```

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

## Syntax Description

<b>delay</b>	Sets a delay time value during which one or more defects must be present before a fault alarm is issued.
<i>mseconds</i>	Integer from 2500 to 10000 that specifies the number of milliseconds for either a delay or a reset of an alarm.  The default is 2500 for the <b>delay</b> option. The default is 10000 for the <b>reset</b> option.
<b>notification</b>	Sets the defects that are to be reported if fault alarms are enabled.
<b>all</b>	Reports all defects: DefRDI, DefMACStatus, DefRemote, DefError, and DefXcon.
<b>error-xcon</b>	Reports only DefError and DefXcon defects.
<b>mac-remote-error-xcon</b>	Reports only DefMACStatus, DefRemote, DefError, and DefXcon (default) defects. This option is the default.
<b>none</b>	No defects are reported.
<b>remote-error-xcon</b>	Reports only DefRemote, DefError, and DefXcon defects.
<b>xcon</b>	Reports only DefXcon defects.
<b>reset</b>	Sets a reset time value that, after a fault alarm, no defects must be present before another fault alarm is enabled.

## Command Default

Alarms are disabled.

## Command Modes

Ethernet CFM interface configuration (config-if-ecfm-mep)

## Command History

Release	Modification
12.2(33)SXI2	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.

## Usage Guidelines

This command overrides the global **ethernet cfm alarm** command.

If a higher priority defect occurs after a lower priority defect has triggered an alarm but before the alarm has reset, immediately issue another fault alarm for the higher priority defect.

Output of the **show running all** command displays “alarm delay 2500” when the default value for the **delay** option is configured, “alarm mac-remote-error-xcon” when the default value for the **notification** option is configured, and “alarm reset 10000” when the default value for the **reset** option is configured.

### Examples

The following example shows how to set up notifications for all defects:

```
Router(config)# ethernet cfm domain test level 5
Router(config-ecfm)# service vlan-id 17 vlan 17
Router(config-ecfm-srv)# exit
Router(config-ecfm)# exit
Router(config-if)# ethernet cfm mep domain test mpid 5 vlan 17
Router(config-if-ecfm-mep)# alarm notification all
```

The following example shows how to set the time during which one or more defects must be present before a fault alarm is issued to 7000 milliseconds:

```
Router(config)# ethernet cfm domain test level 5
Router(config-ecfm)# service vlan-id 17 vlan 17
Router(config-ecfm-srv)# exit
Router(config-ecfm)# exit
Router(config-if)# ethernet cfm mep domain test mpid 5 vlan 17
Router(config-if-ecfm-mep)# alarm delay 7000
```

### Related Commands

Command	Description
<b>ethernet cfm alarm</b>	Configures an alarm for Ethernet CFM.
<b>show running all</b>	Shows the running configuration with default values.

# announce interval

To set an interval value for timing announcement packets, use the **announce interval** command in Precision Time Protocol clock port mode. To remove an announcement interval configuration, use the **no** form of this command.

**announce interval** *interval-value*

**no announce interval** *interval-value*

## Syntax Description

<i>interval-value</i>	Specifies the interval for announce messages. The intervals use log base 2 values, as follows:
	<ul style="list-style-type: none"> <li>• 4—1 packet every 16 seconds</li> <li>• 3—1 packet every 8 seconds</li> <li>• 2—1 packet every 4 seconds</li> <li>• 1—1 packet every 2 seconds</li> <li>• 0—1 packet every second</li> </ul>

## Command Default

For the IE 3000 switch, the default value is 1. For the MWR 2941 router, the default value is 2.

## Command Modes

PTP clock port configuration (config-ptp-port)

## Command History

Release	Modification
15.0(1)S	This command was introduced.

## Usage Guidelines

The interval value defined by this command impacts the timeout value defined by the **announce timeout** command.

## Examples

The following example shows how to configure an announcement interval:

```
Router# configure terminal
Router(config)# ptp clock ordinary domain 0
Router(config-ptp-clk)# clock-port slave slaveport
Router(config-ptp-port)# announce interval 3
Router(config-ptp-port)# end
```

## Related Commands

Command	Description
<b>announce timeout</b>	Sets the timeout value for timing announcement packets.

# announce timeout

To set a timeout value for timing announcement packets, use the **announce timeout** command in Precision Time Protocol clock port mode. To remove an announcement timeout configuration, use the **no** form of this command.

**announce timeout** *timeout-value*

**no announce timeout** *timeout-value*

<b>Syntax Description</b>	<i>timeout-value</i>	Specifies the number of announcement intervals before the session times out. The range is from 1 to 10. The default is 3.
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<b>Command Default</b>	The default timeout value is 3.
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<b>Command Modes</b>	PTP clock port configuration (config-ptp-port)
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<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	15.0(1)S	This command was introduced.

<b>Usage Guidelines</b>	This command configures the number of announcement intervals before the session times out. To define the length of the announcement intervals, use the <b>announce interval</b> command.
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<b>Examples</b>	The following example shows how to configure an announcement timeout:
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```
Router# configure terminal
Router(config)# ptp clock ordinary domain 0
Router(config-ptp-clk)# clock-port slave slaveport
Router(config-ptp-port)# announce timeout 7
Router(config-ptp-port)# end
```

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<b>announce interval</b>	Sets interval value for timing announcement packets.

# backbone interface

To configure a backbone interface for a redundancy group, use the **backbone interface** command in interchassis redundancy configuration mode. To remove the configuration, use the **no** form of this command.

**backbone interface** *type number*

**no backbone interface** *type number*

## Syntax Description

<i>type</i>	String that identifies the type of interface.
<i>number</i>	Integer that identifies the interface.

## Command Default

A backbone interface is not configured.

## Command Modes

Interchassis redundancy configuration (config-r-ic)

## Command History

Release	Modification
12.2(33)SRE	This command was introduced.

## Usage Guidelines

Use this command to configure a backbone interface to monitor all interfaces in a redundancy group. For example, if all interfaces are in the DOWN state (core isolation), the backbone interface signals the redundancy group clients, and they may initiate attachment circuit (AC) failover procedures. An example client might be Multichassis Link Aggregation Control Protocol (mLACP).

## Examples

The following example shows how to configure an Ethernet backbone interface:

```
Router> enable
Router# configure terminal
Router(config)# redundancy
Router(config-r)# interchassis group 1
Router(config-r-ic)# backbone interface ethernet 0/1
```

## bridge-domain (global)

To configure components on a bridge domain, use the **bridge-domain** command in global configuration mode. To remove the configured components from the bridge domain and to return the components to the bridge-domain default state, use the **no** form of this command.

```
bridge-domain {bridge-id [c-mac] | c-mac aging-time minutes}
```

```
no bridge-domain {bridge-id [c-mac] | c-mac aging-time}
```

### Syntax Description

<i>bridge-id</i>	Integer from 1 to 16384 that identifies the bridge domain. <ul style="list-style-type: none"> <li>The upper limit may vary based on the platform.</li> </ul>
<b>c-mac</b>	Configures the bridge domain as a customer domain.
<b>aging-time</b>	Configures the aging time for the customer domain.
<i>minutes</i>	Integer from 1 to 600 that is the aging time, in minutes. The default is 5.

### Command Default

No components are configured on the bridge domain.

### Command Modes

Global configuration (config)

### Command History

Release	Modification
12.2(33)SRD	This command was introduced.
12.2(33)SRE	This command was modified. The <b>aging-time</b> and <b>c-mac</b> keywords were added and the <i>minutes</i> argument was added.

### Usage Guidelines

When the **bridge-domain** command is executed without the **aging-time** keyword, the command mode changes from global configuration mode (config) to bridge-domain configuration mode (config-bdomain). Issuing the **bridge-domain c-mac aging-time** command does not result in a command mode change.

In bridge-domain configuration mode, additional components can be configured on the bridge domain; for example, the MAC address limiting security component.



#### Note

In service instance configuration mode, the **bridge-domain** command binds a service instance to a bridge-domain instance.

**Examples**

The following example shows how to configure a bridge domain as a customer domain and place the CLI in bridge-domain configuration mode:

```
Router> enable
Router# configure terminal
Router(config)# bridge-domain 100 c-mac
Router(config-bdomain)# mac limit maximum addresses 10
```

The following example shows how to configure a bridge domain as a customer domain with an aging time of 400 minutes:

```
Router> enable
Router# configure terminal
Router(config)# bridge-domain c-mac aging-time 400
```

**Related Commands**

Command	Description
<b>bridge-domain</b>	In service instance configuration mode, binds a service instance to a bridge domain.
<b>mac limit maximum addresses</b>	Specifies the MAC address limit on a bridge domain.

## bridge-domain (service instance)

To bind a service instance or a MAC tunnel to a bridge domain instance, use the **bridge-domain** command in either service instance configuration mode or MAC-in-MAC tunnel configuration mode. To unbind a service instance or MAC tunnel from a bridge domain instance, use the **no** form of this command.

```
bridge-domain bridge-id [split-horizon [group group-id]]
```

```
no bridge-domain bridge-id [split-horizon [group group-id]]
```

### Syntax on the Cisco ASR 1000 Series Aggregation Router

```
bridge-domain bridge-id [split-horizon group group-id]
```

```
no bridge-domain bridge-id [split-horizon group group-id]
```

Syntax Description	
<i>bridge-id</i>	Numerical identifier for the bridge domain instance. The range is an integer from 1 to the platform-specific upper limit, where platform-specific upper limit is the maximum allowed by the platform. <ul style="list-style-type: none"> <li>Upper limit on the Cisco ASR 1000 router is 4096.</li> </ul>
<b>split-horizon</b>	(Optional) Configures a port or service instance as a member of a split-horizon group. <ul style="list-style-type: none"> <li>This keyword is not supported in MAC-in-MAC tunnel configuration mode.</li> </ul>
<b>group</b>	(Optional) Defines the split-horizon group. <ul style="list-style-type: none"> <li>This keyword is not supported in MAC-in-MAC tunnel configuration mode.</li> </ul>
<i>group-id</i>	(Optional) Identifier for the split-horizon group. Range is 1 to 65533. <ul style="list-style-type: none"> <li>This argument is not supported in MAC-in-MAC tunnel configuration mode.</li> <li>On the Cisco ASR 1000 router, the only values supported are <b>0</b> and <b>1</b>.</li> </ul>

**Command Default** Service instances and MAC tunnels are not bound to a bridge domain instance.

**Command Modes** Service instance configuration (config-if-svc)  
MAC-in-MAC tunnel configuration (config-tunnel-minm)

Command History	Release	Modification
	12.2(33)SRB	This command was introduced.
	12.2(33)SRD	This command was modified. The <b>split-horizon</b> keyword was added.
	12.2(33)SRE	This command was modified. Support for this command was added in MAC-in-MAC tunnel configuration mode.
	Cisco IOS XE Release 3.2S	This command was integrated into Cisco IOS XE Release 3.2S.

**Usage Guidelines**

Use the **bridge-domain** (service instance) command to bind either a service instance or a MAC tunnel to a bridge domain.

Bridge domains cannot be configured under a service instance under a MAC tunnel without encapsulation also being configured.

The Cisco ASR 1000 router does not support MAC tunnels.

**Note**

The **bridge-domain** (config) command allows a user to configure components on a bridge domain. For example, the MAC Address Limiting security component can be configured on a bridge domain using this command.

**Examples**

The following example shows how to bind a bridge domain to a service instance:

```
Router> enable
Router# configure terminal
Router(config)# interface gigabitethernet 2/0/0
Router(config-if)# service instance 100 ethernet
Router(config-if-srv)# encapsulation dot1q 100
Router(config-if-srv)# bridge-domain 200
```

The following example shows how to bind a MAC tunnel to a service instance:

```
Router> enable
Router# configure terminal
Router(config)# ethernet mac-tunnel virtual 100
Router(config-tunnel-minm)# bridge-domain 200
```

**Related Commands**

Command	Description
<b>bridge-domain (config)</b>	Enables a user to configure components on a bridge domain.
<b>ethernet evc</b>	Defines an EVC and enters EVC configuration mode.
<b>ethernet service instance</b>	Configures an Ethernet service instance on an interface and enters service instance configuration mode.

# cfm encapsulation

To configure connectivity fault management (CFM) Ethernet frame encapsulation, use the **cfm encapsulation** command in service instance configuration mode. To remove the encapsulation, use the **no** form of this command.

```
cfm encapsulation { dot1ad vlan-id | dot1q vlan-id } [cos cos-value] [dot1q vlan-id | second-dot1q vlan-id] [cos cos-value]
```

```
no cfm encapsulation { dot1ad vlan-id | dot1q vlan-id } [cos cos-value] [dot1q vlan-id | second-dot1q vlan-id] [cos cos-value]
```

## Syntax Description

<b>dot1ad</b>	Indicates the 802.1ad provider bridges encapsulation type.
<i>vlan-id</i>	Integer from 1 to 4094 that specifies the VLAN on which to send CFM frames out.
<b>dot1q</b>	(Optional) Supports the IEEE 802.1q standard for encapsulation of traffic and specifies the outer dot1q encapsulation tag.
<b>cos</b>	(Optional) Indicates the class-of-service (CoS) for CFM packets.
<i>cos-value</i>	(Optional) Integer from 0 to 7 that specifies the CoS.
<b>second-dot1q</b>	(Optional) Specifies the inner dot1q encapsulation tag. Valid option only when you first select the outer <b>dot1q</b> encapsulation tag. When the <b>dot1ad</b> encapsulation type is selected first, <b>dot1q</b> is a valid option.

## Command Default

CFM Ethernet frame encapsulation is not configured.

## Command Modes

Service instance configuration (config-if-srv)

## Command History

Release	Modification
12.2(33)SRD	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.

## Usage Guidelines

To use the **cfm encapsulation** command, you must first configure a bridge domain in Ethernet service configuration mode using the **bridge-domain** command.

When a range of VLANs is configured under the Ethernet flow point, the **cfm encapsulation** command configures the VLAN ID on which to send locally sourced CFM frames. The VLAN ID specified must be within the range configured in the **encapsulation** command.

The **cfm encapsulation** command does not support untagged service instances.

**Examples**

The following example shows how to configure the **cfm encapsulation** command:

```

ethernet cfm domain CUSTOMER level 7 direction outward
  service customer_100 evc evc_100
ethernet cfm domain MIP level 7
ethernet cfm domain PROVIDER level 4
  service provider_100 evc evc_100
  mep crosscheck mpid 200 evc evc_100 mac aabb.cc00.0310
  ethernet evc evc_100
interface Ethernet 1/0
  no ip address
  service instance 100 ethernet evc_100
  encapsulation dot1q 100
  bridge-domain 100
  cfm encapsulation dot1q 1 cos 2 second-dot1q 3 cos 4

```

**Related Commands**

Command	Description
<b>bridge-domain</b>	Binds the service instance to a bridge domain instance.
<b>service instance ethernet</b>	Configures an Ethernet service instance on an interface and places the CLI in service instance configuration mode.

# cfm mep domain

To configure a maintenance endpoint (MEP) for a domain, use the **cfm mep domain** command in either service instance configuration mode or virtual forwarding instance (VFI) configuration mode. To remove the MEP, use the **no** form of this command.

```
cfm mep domain domain-name [inward | outward] mpid mpid-value [cos cos-value]
```

```
no cfm mep domain domain-name [inward | outward] mpid mpid-value
```

## Syntax Description

<i>domain-name</i>	String from 1 to 154 characters that identifies the domain name.
<b>inward</b>	(Optional) Indicates inward direction of connectivity fault management (CFM) packets.
<b>outward</b>	(Optional) Indicates outward direction of CFM packets.
<b>mpid</b>	Indicates the maintenance point ID (MPID).
<i>mpid-value</i>	Integer from 1 to 8191 that identifies the MPID.
<b>cos</b>	(Optional) Indicates the class-of-service (CoS) for CFM packets.
<i>cos-value</i>	(Optional) Integer from 0 to 7 that specifies the CoS.

## Command Default

The direction of CFM packets is inward.

## Command Modes

Service instance configuration (config-if-srv)  
VFI configuration (config-vfi)

## Command History

Release	Modification
12.2(33)SRD	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.

## Usage Guidelines

The **cfm mep domain** command defines an Ethernet flow point (EFP) as a MEP. To use the **cfm mep domain** command, you must first configure a bridge domain in service instance configuration mode by issuing the **bridge-domain** command.

## Examples

The following example shows how to configure the **cfm mep domain** command:

```

ethernet cfm domain CUSTOMER level 7 direction outward
  service customer_100 evc evc_100
ethernet cfm domain MIP level 7
ethernet cfm domain PROVIDER level 4
  service provider_100 evc evc_100
  mep crosscheck mpid 200 evc evc_100 mac aabb.cc00.0310
ethernet evc evc_100
interface Ethernet 1/0
  no ip address

```

```
service instance 100 ethernet evc_100
  encapsulation dot1q 100
  bridge-domain 100
  cfm mep domain CUSTOMER outward mpid 1001
```

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>bridge-domain</b>	Binds the service instance to a bridge domain instance.
<b>service instance ethernet</b>	Configures an Ethernet service instance on an interface and places the CLI in service instance configuration mode.

# channel-group (interface)

To assign and configure an EtherChannel interface to an EtherChannel group, use the **channel-group** command in interface configuration mode. To remove the channel-group configuration from the interface, use the **no** form of this command.

**channel-group** *channel-group-number* **mode** { **active** | **on** | **passive** }

**no channel-group** *channel-group-number*

## Cisco 2600 Series, Cisco 3600 Series, and Cisco 3700 Series Routers

**channel-group** *channel-group-number* **mode on**

**no channel-group** *channel-group-number*

## Cisco ASR 1000 Series Routers

**channel-group** *channel-group-number* **mode** { **active** | **passive** }

**no channel-group**

## Cisco Catalyst Switches

**channel-group** *channel-group-number* **mode** { **active** | **on** | **auto** [**non-silent**] | **desirable** [**non-silent**] | **passive** }

**no channel-group** *channel-group-number*

### Syntax Description

<i>channel-group-number</i>	Integer that identifies the channel-group. Valid values are from 1 to 256; the maximum number of integers that can be used is 64. <ul style="list-style-type: none"> <li>For Fast EtherChannel groups, the number is an integer from 1 to 4. This number is the one previously assigned to the port-channel interface.</li> <li>On the Cisco ASR 1000 series router, valid values are from 1 to 64.</li> </ul>
<b>mode</b>	Specifies the EtherChannel mode of the interface.
<b>active</b>	Enables Link Aggregation Control Protocol (LACP) unconditionally.
<b>on</b>	Enables EtherChannel only.
<b>auto</b>	Places a port into a passive negotiating state in which the port responds to Port Aggregation Protocol (PAgP) packets that it receives but does not initiate PAgP packet negotiation.
<b>non-silent</b>	(Optional) Used with the <b>auto</b> or <b>desirable</b> mode when traffic is expected from the other device.
<b>desirable</b>	Places a port into an active negotiating state in which the port initiates negotiations with other ports by sending PAgP packets.
<b>passive</b>	Enables LACP only when an LACP device is detected. This is the default state.

### Command Default

No channel groups are assigned.

**Command Modes** Interface configuration (config-if)

Command History	Release	Modification
	11.1CA	This command was introduced.
	12.0(7)XE	Support for this command was implemented on Cisco Catalyst 6000 series switches.
	12.1(3a)E3	The number of valid values for the <i>number</i> argument was changed; see the “Usage Guidelines” section for valid values.
	12.2(2)XT	This command was implemented on the Cisco 2600 series, Cisco 3600 series, and Cisco 3700 series routers.
	12.2(8)T	Support for this command was implemented on the Cisco 2600 series, the Cisco 3600 series, and the Cisco 3700 series routers and integrated into Cisco IOS Release 12.2(8)T.
	12.2(14)SX	Support for this command was implemented on the Supervisor Engine 720.
	12.2(17d)SXB	Support for this command on the Supervisor Engine 2 was integrated into Cisco IOS Release 12.2(17d)SXB.
	12.2(18)SXE	This command was changed to support advanced QinQ translation on QinQ link bundles using GE-WAN interfaces on an OSM-2+4GE-WAN+ OSM on Cisco 7600 series routers.
	12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
	12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
	12.2(33)SRB	Support for this command on the Cisco 7600 router was integrated into Cisco IOS Release 12.2(33)SRB.
	Cisco IOS XE Release 2.4	This command was integrated into Cisco IOS XE Release 2.4.

**Usage Guidelines** OSMs are not supported on Cisco 7600 series routers that are configured with a Supervisor Engine 32.

#### IP Address for the Physical Interface

You do not have to disable the IP address that is assigned to a physical interface that is part of a channel group, but Cisco highly recommends doing so.

#### Layer 2 and Layer 3 Port Channels

You can create both Layer 2 and Layer 3 port channels by entering the **interface port-channel** command or, when the channel-group gets its first physical interface assignment. The port channels are not created at run time, nor are they created dynamically.

You do not have to create a port-channel interface before assigning a physical interface to a channel group. A port-channel interface is automatically created when the channel group gets its first physical interface, if it is not already created.

#### Propagation of Configuration and Attribute Changes

Any configuration or attribute changes you make to the port-channel interface are propagated to all interfaces within the same channel group as the port channel. (for example, configuration changes are also propagated to the physical interfaces that are not part of the port-channel, but are part of the channel group.)

### The on Keyword

When you use the **on** keyword, a usable EtherChannel exists only when a port group in **on** mode is connected to another port group in the **on** mode.

### Cisco 2600 Series, Cisco 3600 Series, and Cisco 3700 Series Routers

You do not have to create a port-channel interface before assigning a physical interface to a channel group. A port-channel interface is created automatically when the channel group gets its first physical interface, if it is not already created.

### Cisco ASR 1000 Series Routers

The Cisco ASR 1000 series router has the following prerequisites and restriction:

- A port-channel must be created before member links are assigned to it.
- IP addresses must be disabled on member links before those links can be included in a port-channel.
- Fast Ethernet interfaces are not supported.

### Cisco Catalyst Switches

The number of valid values for *number* depends on the software release. For software releases prior to Cisco IOS Release 12.1(3a)E3, valid values are from 1 to 256; for Cisco IOS Release 12.1(3a)E3, 12.1(3a)E4, and 12.1(4)E1, valid values are from 1 to 64. Cisco IOS Release 12.1 E and later releases support a maximum of 64 values ranging from 1 to 256.

The channel-group number is global and is shared between all the channeling protocols. If a specific channel number is used for the PAgP-enabled interfaces of a channel group, that same channel number cannot be used for configuring a channel that has LACP-enabled interfaces or vice versa.

Entering the **auto** or **desirable** keyword enables PAgP on the specified interface; the command will be rejected if it is issued on an LACP-enabled interface.

The **active** and **passive** keywords are valid on PAgP-disabled interfaces only.

You can change the mode for an interface only if it is the only interface that is designated to the specified channel group.

The **on** keyword forces the bundling of the interface on the channel without any negotiation.

You can manually configure a switch with PAgP on one side and LACP on the other side in the **on** mode.

With the **on** mode, a usable EtherChannel exists only when a port group in **on** mode is connected to another port group in **on** mode.

If you enter the **channel group** command on an interface that is added to a channel with a different protocol than the protocol you are entering, the command is rejected.

If the interface belongs to a channel, the **no** form of this command is rejected.

All ports in the same channel group must use the same protocol; you cannot run two protocols on one channel group.

PAgP and LACP are not compatible; both ends of a channel must use the same protocol.

You can change the protocol at any time, but this change causes all existing EtherChannels to reset to the default channel mode for the new protocol.

Configure all ports in an EtherChannel to operate at the same speed and duplex mode (full duplex only for LACP mode).

All ports in a channel must be on the same DFC-equipped module. You cannot configure any of the ports to be on other modules.

On systems that are configured with nonfabric-enabled modules and fabric-enabled modules, you can bundle ports across all modules, but those bundles cannot include a DFC-equipped module port.

You do not have to create a port-channel interface before assigning a physical interface to a channel group. A port-channel interface is created automatically when the channel group gets its first physical interface, if it is not already created.

You do not have to disable the IP address that is assigned to a physical interface that is part of a channel group, but it is highly recommended.

You can create both Layer 2 and Layer 3 port channels by entering the **interface port-channel** command or when the channel group gets its first physical interface assignment. The port channels are not created at runtime or dynamically.

Any configuration or attribute changes that you make to the port-channel interface are propagated to all interfaces within the same channel group as the port channel (for example, configuration changes are also propagated to the physical interfaces that are not part of the port channel but are part of the channel group).

When configuring Layer 2 EtherChannels, you cannot put Layer 2 LAN ports into manually created port-channel logical interfaces.

Only the **on** mode is supported when using this command with GE-WAN ports on the OSM-2+4GE-WAN+ OSM to create QinQ link bundles for advanced QinQ translation. Also, you cannot use the **channel-group** command on GE-WAN interfaces if MPLS is configured. You must remove all IP, MPLS, and other Layer 3 configuration commands before using the **channel-group** command with GE-WAN interfaces.



#### Note

The GE-WAN interfaces on an OSM-2+4GE-WAN+ OSM behave slightly differently than other interfaces if you want to move the interface from one group to another. To move most other interfaces, you can enter the **channel-group** command again to delete the interface from the old group and move it to the new group. For GE-WAN ports, however, you must manually remove the interface from the group by entering the **no channel-group** command before assigning it to a new group.



#### Caution

Do not enable Layer 3 addresses on the physical EtherChannel interfaces. Assigning bridge groups on the physical EtherChannel interfaces causes loops in your network.

For a complete list of guidelines, see the “Configuring EtherChannel” section of the *Cisco 7600 Series Router Cisco IOS Software Configuration Guide*.

#### Fast EtherChannel

Before you assign a Fast Ethernet interface to a Fast EtherChannel group, you must first create a port-channel interface. To create a port-channel interface, use the **interface port-channel** global configuration command.

If the Fast Ethernet interface has an IP address assigned, you must disable it before adding the Fast Ethernet interface to the Fast EtherChannel. To disable an existing IP address on the Fast Ethernet interface, use the **no ip address** command in interface configuration mode.

The Fast EtherChannel feature allows multiple Fast Ethernet point-to-point links to be bundled into one logical link to provide bidirectional bandwidth of up to 800 Mbps. Fast EtherChannel can be configured between Cisco 7500 series routers and Cisco 7000 series routers with the 7000 Series Route Switch Processor (RSP7000) and 7000 Series Chassis Interface (RSP7000CI) or between a Cisco 7500 series router or a Cisco 7000 series router with the RSP7000 and RSP700CI and a Cisco Catalyst 5000 switch.

A maximum of four Fast Ethernet interfaces can be added to a Fast EtherChannel group.

**Caution**

The port-channel interface is the routed interface. Do not enable Layer 3 addresses on the physical Fast Ethernet interfaces. Do not assign bridge groups on the physical Fast Ethernet interfaces because it creates loops. Also, you must disable spanning tree.

To display information about the Fast EtherChannel, use the **show interfaces port-channel EXEC** command.

For more guidelines see the “Configuring EtherChannel” section of the *Cisco 7600 Series Router Cisco IOS Software Configuration Guide* and the “Configuring EtherChannel” section of the *Catalyst 6500 Series Switch Cisco IOS Software Configuration Guide*.

**Examples**

This example shows how to add EtherChannel interface 1/0 to the EtherChannel group that is specified by port-channel 1:

```
Router(config-if)# channel-group 1 mode on
```

The following example shows how to add interface Fast Ethernet 1/0 to the Fast EtherChannel group specified by port-channel 1:

```
Router(config)# interface port-channel 1
Router(config-if)# exit
Router(config)# interface fastethernet 1/0
Router(config-if)# channel-group 1
```

**Related Commands**

Command	Description
<b>interface</b>	Creates a port-channel virtual interface and puts the CLI in interface configuration mode when the <b>port-channel</b> keyword is used.
<b>ip address</b>	Sets a primary or secondary IP address on an interface.
<b>show etherchannel</b>	Displays the EtherChannel information for a channel.
<b>show interfaces port-channel</b>	Displays traffic that is seen by a specific port channel.

# clear bridge-domain mac-table

To clear a bridge domain of learned MAC addresses, use the **clear bridge-domain mac-table** command in privileged EXEC mode.

```
clear bridge-domain bridge-id mac-table [mac-address]
```

## Syntax Description

<i>bridge-id</i>	Integer from 1 to 16384 that identifies a bridge domain.
<i>mac-address</i>	(Optional) MAC address to be cleared.

## Command Modes

Privileged EXEC (#)

## Command History

Release	Modification
12.2(33)SRD	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.

## Usage Guidelines

Use the **clear bridge-domain mac table** command to purge MAC addresses that have been dynamically learned by a bridge domain.

This command is available on both route processors and line cards. To invoke this command use the **remote command module** command; for example, **remote command module 10 clear bridge-domain 25 mac-table**.

## Examples

The following example shows how to clear all dynamically learned MAC addresses in the MAC table of bridge domain 12:

```
Router# clear bridge-domain 12 mac table
```

The following example shows how to clear a specific MAC address from the MAC table of bridge domain 12:

```
Router# clear bridge-domain 12 mac table 0001.0001.aaaa
```

## Related Commands

Command	Description
<b>show bridge-domain</b>	Displays information about a bridge domain.

# clear ethernet cfm ais

To clear a maintenance endpoint (MEP) or server maintenance endpoint (SMEP) out of the Alarm Indication Signal (AIS) defect condition, use the **clear ethernet cfm ais** command in privileged EXEC mode.

## Ethernet Connectivity Fault Management (CFM) Cisco Proprietary Draft 1 (CFM D1)

```
clear ethernet cfm ais { domain domain-name mpid mpid-id { evc name | vlan vlan-id } |
link-status interface Ethernet number }
```

## Ethernet CFM IEEE 802.1ag Standard (CFM IEEE)

```
clear ethernet cfm ais { domain domain-name mpid mpid-id vlan vlan-id |
link-status interface Ethernet number }
```

Syntax Description	Parameter	Description
	<b>domain</b>	Indicates that a maintenance domain is specified.
	<i>domain-name</i>	String of a maximum of 154 characters that identifies the domain.
	<b>mpid</b>	Indicates that a maintenance point ID (MPID) is specified.
	<i>mpid-id</i>	An integer in the range of 1 to 8191 that identifies the MPID.
	<b>evc</b>	Indicates that an Ethernet virtual circuit (EVC) is specified.
	<i>name</i>	String identifying the EVC name.
	<b>vlan</b>	Indicates that a VLAN is specified.
	<i>vlan-id</i>	An integer in the range 1 to 4094 that identifies the VLAN.
	<b>link-status</b>	Indicates either a SMEP or a link up/link down condition.
	<b>interface</b>	Indicates that an interface is specified.
	<b>Ethernet</b>	Specifies an Ethernet interface.
	<i>number</i>	Integer from 0 to 15 that identifies the Ethernet interface.

**Command Modes** Privileged EXEC (#)

Command History	Release	Modification
	12.2(33)SRD	This command was introduced.
	15.0(1)XA	This command was modified. The <b>evc</b> keyword and <i>name</i> argument are not supported in Cisco IOS Release 15.0(1)XA.

**Usage Guidelines** If a MEP does not exit the AIS state when all errors are resolved, use the **clear ethernet cfm ais** command with the **domain** and **mpid** keywords to clear the AIS defect condition. If a SMEP does not exit the AIS state when all errors are resolved, use the **clear ethernet cfm ais** command with the **link-status interface** keywords to clear the AIS defect condition.

---

**Examples**

The following example shows how to clear a SMEP of an AIS defect condition:

```
Router# clear ethernet cfm ais link-status interface ethernet 0/0
```

The following examples show how to clear a MEP of an AIS defect condition:

```
Router# clear ethernet cfm ais domain xxx mpid 100 vlan 11  
Router# clear ethernet cfm ais domain xxx mpid 100 evc test
```

---

**Related Commands**

Command	Description
<code>ethernet cfm ais</code>	Enables AIS generation from a SMEP.

---

# clear ethernet cfm errors

To clear continuity check error conditions logged on a device, use the **clear ethernet cfm errors** command in privileged EXEC mode.

## Cisco pre-Standard Connectivity Fault Management Draft 1.0 (CFM D1)

```
clear ethernet cfm errors [domain domain-name | level level-id]
```

## CFM IEEE 802.1ag Standard (CFM IEEE)

```
clear ethernet cfm errors [domain-id {mac-address domain-number | domain-name | dns
dns-name | null}] [service {ma-name | ma-num | vlan-id vlan-id | vpn-id vpn-id}]
```

### Syntax Description

<b>domain</b>	(Optional) Clears errors for a maintenance domain.
<i>domain-name</i>	(Optional) String of a maximum of 154 characters.
<b>level</b>	(Optional) Clears errors for a maintenance level.
<i>level-id</i>	(Optional) Integer in the range of 0 to 7 that identifies the maintenance level.
<b>domain-id</b>	(Optional) Clears errors by domain ID.
<i>mac-address</i>	(Optional) MAC address of the maintenance domain.
<i>domain-number</i>	(Optional) Integer in the range of 0 to 65535.
<b>dns</b>	(Optional) Specifies a domain name service (DNS).
<i>dns-name</i>	(Optional) String of a maximum of 43 characters.
<b>null</b>	(Optional) Indicates there is not a domain name.
<b>service</b>	(Optional) Specifies a maintenance association within the domain.
<i>ma-name</i>	(Optional) String that identifies the maintenance association.
<i>ma-num</i>	(Optional) Integer that identifies the maintenance association.
<b>vlan-id</b>	(Optional) Specifies a VLAN.
<i>vlan-id</i>	(Optional) Integer from 1 to 4094 that identifies the VLAN.
<b>vpn-id</b>	(Optional) Specifies a virtual private network (VPN).
<i>vpn-id</i>	(Optional) Integer from 1 to 32767 that identifies the VPN.

### Command Default

The error database is unchanged; existing entries remain in the database.

### Command Modes

Privileged EXEC (#)

### Command History

Release	Modification
12.2(33)SRA	This command was introduced.
12.4(11)T	This command was integrated into Cisco IOS Release 12.4(11)T.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
12.2(33)SXI2	This command was integrated into Cisco IOS Release 12.2(33)SXI2.

**Usage Guidelines**

Use the **clear ethernet cfm errors** command to purge error database entries that are not needed and when you want to work with a cleared database. Also, use this command with a specified domain if you want to clear errors for that domain.

In CFM IEEE, if a domain name has more than 43 characters, a warning message is displayed notifying that the maintenance domain ID (MDID) will be truncated to 43 characters in continuity check messages if “id <fmt> <MDID>” is not configured.

**Examples**

The following example shows a **clear ethernet cfm errors** command for errors at maintenance level 3. No output is generated when this command is issued.

```
Router# clear ethernet cfm errors level 3
```

The following example shows how to clear errors for a DNS on VLAN 17. No output is generated when this command is issued.

```
Router# clear ethernet cfm errors domain-id dns Service10 service vlan-id 17
```

**Related Commands**

Command	Description
<b>show ethernet cfm errors</b>	Displays CFM continuity check error conditions logged on a device since it was last reset or since the log was last cleared.

# clear ethernet cfm maintenance-points remote

To purge the contents of the continuity check database, use the **clear ethernet cfm maintenance-points remote** command in privileged EXEC mode.

## Cisco pre-Standard Connectivity Fault Management Draft 1.0 (CFM D1)

```
clear ethernet cfm maintenance-points remote [domain domain-name | level level-id]
```

## CFM IEEE 802.1ag Standard (CFM IEEE)

```
clear ethernet cfm maintenance-points remote [domain domain-name]
```

### Syntax Description

<b>domain</b>	(Optional) Indicates that a maintenance domain is specified.
<i>domain-name</i>	(Optional) String of a maximum of 154 characters that identifies the domain.
<b>level</b>	(Optional) Indicates that a maintenance level is specified. <ul style="list-style-type: none"> <li>This keyword is not available in CFM IEEE.</li> </ul>
<i>level-id</i>	(Optional) Integer in the range of 0 to 7 that identifies the maintenance level. <ul style="list-style-type: none"> <li>This argument is not available in CFM IEEE.</li> </ul>

### Command Default

The continuity check database is unchanged; existing entries remain in the database.

### Command Modes

Privileged EXEC (#)

### Command History

Release	Modification
12.2(33)SRA	This command was introduced.
12.4(11)T	This command was integrated into Cisco IOS Release 12.4(11)T.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
12.2(33)SX12	This command was integrated into Cisco IOS Release 12.2(33)SX12.

### Usage Guidelines

Use this command to clear the entire continuity check database or clear the database for a specific domain or level. When a domain is specified, only entries for that domain are purged. When a level is specified, entries for all domains at that level are purged.

If a maintenance domain is not specified, the entire continuity check database is cleared.

In CFM IEEE, the **level** keyword and *level-id* argument are not supported. Also, if a domain name is more than 43 characters, a warning message is displayed notifying that the maintenance domain ID (MDID) will be truncated to 43 characters in continuity check messages if “id <fmt> <MDID>” is not configured.

---

**Examples**

The following example shows a **clear ethernet cfm maintenance-points remote** command. No output is generated when this command is issued.

```
Router# clear ethernet cfm maintenance-points remote
```

---

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>show ethernet cfm maintenance-points remote</b>	Displays information about remote maintenance points in the continuity check database.

---

# clear ethernet cfm statistics

To clear a maintenance endpoint (MEP) or server maintenance endpoint (SMEP) out of the Alarm Indication Signal (AIS) defect condition, use the **clear ethernet cfm ais** command in privileged EXEC mode.

```
clear ethernet cfm statistics [mpid mpid-id]
```

## Syntax Description

<b>mpid</b>	Indicates that a maintenance point ID (MPID) is specified.
<i>mpid-id</i>	An integer in the range of 1 to 8191 that identifies the MPID.

## Command Modes

Privileged EXEC (#)

## Command History

Release	Modification
12.2(33)SXI2	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.

## Usage Guidelines

If a MEP does not exit the AIS state when all errors are resolved, use the **clear ethernet cfm ais** command with the **domain** and **mpid** keywords to clear the AIS defect condition. If a SMEP does not exit the AIS state when all errors are resolved, use the **clear ethernet cfm ais** command with the **link-status interface** keywords to clear the AIS defect condition.

## Examples

The following example shows how to clear connectivity fault management (CFM) statistics from a SMEP of an AIS defect condition:

```
Router# clear ethernet cfm statistics mpid 800
```

## Related Commandss

Command	Description
<b>clear ethernet cfm ais</b>	Clears a MEP or SMEP out of the AIS defect condition.

# clear ethernet cfm traceroute-cache

To remove the contents of the traceroute cache, use the **clear ethernet cfm traceroute-cache** command in privileged EXEC mode.

**clear ethernet cfm traceroute-cache**

**Syntax Description** This command has no arguments or keywords.

**Command Modes** Privileged EXEC (#)

Command History	Release	Modification
	12.2(33)SRA	This command was introduced.
	12.4(11)T	This command was integrated into Cisco IOS Release 12.4(11)T.
	12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
	12.2(33)SXI2	This command was integrated into Cisco IOS Release 12.2(33)SXI2.

**Usage Guidelines** Use the **clear ethernet cfm traceroute-cache** command to remove traceroute cache entries from previous traceroute operations issued on the device. This command also provides visibility into maintenance intermediate points and maintenance end points of a domain as they were recorded when the operation was performed.

**Examples** The following example shows the **clear ethernet cfm traceroute-cache** command:

```
Router# clear ethernet cfm traceroute-cache
```

Related Commands	Command	Description
	<b>ethernet cfm traceroute cache</b>	Enables caching of Ethernet CFM data learned through traceroute messages.
	<b>show ethernet cfm traceroute-cache</b>	Displays the contents of the traceroute cache.

# clear ethernet lmi statistics

To clear Ethernet local management interface (LMI) statistics counters for all interfaces or for a specific interface, use the **clear ethernet lmi statistics** command in privileged EXEC mode.

```
clear ethernet lmi statistics [interface type number]
```

Syntax Description	interface	(Optional) Specifies the interface on which to clear counters.
	<i>type</i>	(Optional) String that identifies the type of interface. Valid options are the following: <ul style="list-style-type: none"> <li>• <b>ethernet</b>—Ethernet IEEE 802.3 interface</li> <li>• <b>fastethernet</b>—Fast Ethernet IEEE 802.3 interface</li> <li>• <b>gigabitethernet</b>—Gigabit Ethernet IEEE 802.3z interface</li> </ul>
	<i>number</i>	(Optional) Integer that identifies the interface.

**Command Modes** Privileged EXEC (#)

Command History	Release	Modification
	12.4(9)T	This command was introduced.
	12.2(33)SRB	Support for this command on the Cisco 7600 router was integrated into Cisco IOS Release 12.2(33)SRB.

**Usage Guidelines** This command resets counters and is useful when you want to monitor Ethernet LMI errors for a period of time. For example, to monitor errors for 1 hour, you would issue the **clear ethernet lmi statistics** command to reset the counter. At the end of the hour, you would issue the **show ethernet lmi statistics** command to display errors that occurred during that one-hour time period.

**Examples** The following example shows how to clear Ethernet LMI statistics counters on all interfaces:

```
Router# clear ethernet lmi statistics
Clear "show ethernet lmi" statistics counters on all interfaces [confirm]
Router#
```

The following example shows how to clear Ethernet LMI statistics counters on the Gigabit Ethernet 1/0 interface:

```
Router# clear ethernet lmi statistics interface gigabitethernet 1/0
Clear "show ethernet lmi" statistics counters on this interface [confirm]
Router#
```

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>show ethernet lmi</b>	Displays Ethernet LMI Ethernet virtual connections (EVCs) configured on a device.
<b>show interface</b>	Displays statistics for all interfaces configured on a device.

# clear ethernet oam statistics

To reset Ethernet operations, maintenance, and administration (OAM) counters and event statistics on all interfaces or on a specific interface, use the **clear ethernet oam statistics** command in privileged EXEC mode.

**clear ethernet oam statistics** [*interface type number*]

Syntax Description	interface	(Optional) Specifies an interface.
	<i>type</i>	(Optional) Type of Ethernet interface. Valid values are: FastEthernet, GigabitEthernet, TenGigabitEthernet.
	<i>number</i>	(Optional) Integer from 1 to 9 that is the number of the Ethernet interface.

Command Modes	Privileged EXEC (#)
---------------	---------------------

Command History	Release	Modification
	12.2(33)SRA	This command was introduced.
	12.4(15)T	This command was integrated into Cisco IOS Release 12.4(15)T.
	12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.

Usage Guidelines	Use this command when you are debugging or testing and you want all statistics cleared. After this command is issued, the cleared statistics cannot be restored.
------------------	--

Examples	The following example shows how to clear counters and event statistics for all interfaces:
----------	--

```
Router# clear ethernet oam statistics
```

Related Commands	Command	Description
	<b>show ethernet oam statistics</b>	Displays detailed information about Ethernet OAM packets.

# clear ethernet service instance

To clear Ethernet service instance attributes such as MAC addresses and statistics or to purge Ethernet service instance errors, use the **clear ethernet service instance** command in privileged EXEC mode.

```
clear ethernet service instance { id id interface type number
  { errdisable | mac table [address] | stats } | interface type number stats }
```

## Syntax Description

<b>id</b>	Indicates that a specific service instance is specified.
<i>id</i>	Identifies the service instance.
<b>interface</b>	Indicates that a specific interface is specified.
<i>type</i>	Type of interface.
<i>number</i>	Number of the interface.
<b>errdisable</b>	Indicates that a clear action for an error-disabled state is specified.
<b>mac table</b>	Indicates that a MAC table is specified.
<i>address</i>	Secure address in the specified MAC table.
<b>stats</b>	Indicates that service instance statistics are specified.

## Command Modes

Privileged EXEC (#)

## Command History

Release	Modification
12.2(33)SRD	This command was introduced.

## Usage Guidelines

Use the **clear ethernet service instance** command to clear service instance attributes that are not needed and to purge service instance errors.

## Examples

The following example shows how to clear an error-disabled state on service instance 100 on interface Gigabit Ethernet 1/1:

```
Router (#) clear ethernet service instance id 100 interface GigabitEthernet 1/1 errdisable
```

## Related Commands

Command	Description
<b>show ethernet service instance</b>	Displays information about Ethernet service instances.

# clear lldp

To reset either Link Layer Discovery Protocol (LLDP) traffic counters or the table that contains LLDP information about neighbors, use the **clear lldp** command in privileged EXEC mode.

```
clear lldp { counters | table }
```

## Syntax Description

<b>counters</b>	Specifies that the traffic counters are cleared.
<b>table</b>	Specifies that the LLDP table is cleared.

## Command Default

The LLDP traffic counters are not reset, and the table of LLDP information is not cleared.

## Command Modes

Privileged EXEC (#)

## Command History

Release	Modification
12.2(33)SXH	This command was introduced.

## Usage Guidelines

Use this command for informational purposes or to test a symptom of network malfunction such as packet loss.

## Examples

The following example shows how to clear the LLDP counters and display LLDP traffic. The output from the **show lldp traffic** command shows that all the traffic counters have been reset to zero.

```
Router# clear lldp counters
Router# show lldp traffic

LLDP traffic statistics:
  Total frames out: 0
  Total entries aged: 0
  Total frames in: 0
  Total frames received in error: 0
  Total frames discarded: 0
  Total TLVs unrecognized: 0
```

The following example shows how to clear the LLDP table. The output of the **show lldp neighbors** command shows that all information has been deleted from the table.

```
Router# clear lldp table
Router# show lldp neighbors

Capability codes:
  (R) Router, (B) Bridge, (T) Telephone, (C) DOCSIS Cable Device
  (W) WLAN Access Point, (P) Repeater, (S) Station, (O) Other

Device ID           Local Intf      Hold-time  Capability      Port ID
```

**■** clear lldp**Related Commands**

<b>Command</b>	<b>Description</b>
<b>show lldp</b>	Displays information about LLDP in the network.

# clock destination

To specify the IP address of a Precision Time Protocol clock destination, use the **clock destination** command in interface configuration mode. To remove a clock destination configuration, use the **no** form of this command.

**clock destination** *clock-ip-address*

**no clock destination** *clock-ip-address*

<b>Syntax Description</b>	<i>clock-ip-address</i> IP address of the clock destination.
---------------------------	--

<b>Command Default</b>	No default behavior or values.
------------------------	--------------------------------

<b>Command Modes</b>	Clock port configuration (config-ptp-port)
----------------------	--

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	15.0(1)S	This command was introduced.

<b>Usage Guidelines</b>	If the clock port is set to master mode with unicast and negotiation is disabled, you can only configure a single destination. If the clock port is set to master mode with unicast negotiation, you do not need to use this command because the router uses negotiation to determine the IP address of PTP slave devices.
-------------------------	--

<b>Examples</b>	The following example shows how to configure a PTP clock destination:
-----------------	---

```
Router# configure terminal
Router(config)# ptp clock ordinary domain 0
Router(config-ptp-clk)# clock-port masterPort master
Router(config-ptp-port)# clock destination 192.168.1.2
Router(config-ptp-port)# end
```

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<b>clock source</b>	Specifies a PTP clock source.

# clock-port

To specify the clocking mode of a Precision Time Protocol clock port, enter clock port configuration mode using the **clock-port** command in the PTP clock configuration mode. To remove a clocking mode configuration, use the **no** form of this command.

**clock-port** *name* {**slave** | **master**}

**no clock-port** *name* {**slave** | **master**}

## Syntax Description

<i>name</i>	Specifies a name for the clock port.
<b>slave</b>	Sets the clock port to PTP slave mode; the port exchanges timing packets with a PTP master device.
<b>master</b>	Sets the clock port to PTP master mode; the port exchanges timing packets with PTP slave devices.

## Command Default

This command is disabled by default.

## Command Modes

PTP clock configuration (config-ptp-clk)

## Command History

Release	Modification
15.0(1)S	This command was introduced.

## Usage Guidelines

This command defines a new clock port and enters clock port configuration mode.

## Examples

The following example shows how to configure a PTP clock port:

```
Router# configure terminal
Router# ptp clock boundary domain 0
Router(config-ptp-clk)# clock-port slave slaveport
Router(config-ptp-port)# clock source 8.8.8.1
Router(config-ptp-port)# sync limit 1
Router(config-ptp-port)# announce timeout 4
Router(config-ptp-port)# delay-req interval 2
Router(config-ptp-port)# end
```

## Related Commands

Command	Description
<b>ptp clock</b>	Creates a PTP clock instance.

# clock source (PTP)

To configure a connection to a Precision Time Protocol master device, use the **clock source** command in PTP clock port configuration mode. To remove a clock source configuration, use the **no** form of this command.

**clock source** *source-address*

**no clock source** *source-address*

## Syntax Description

*source-address* IP address of the PTP master device.

## Command Default

No default behavior or values.

## Command Modes

PTP clock port configuration (config-ptp-port)

## Command History

Release	Modification
15.0(1)S	This command was introduced.

## Usage Guidelines

This command only applies to a clock port in slave mode.

## Examples

The following example shows how to specify a clock source:

```
Router# configure terminal
Router(config)# ptp clock ordinary domain 0
Router(config-ptp-clk)# tod 3/0 ntp
Router(config-ptp-clk)# output 1pps 3/0
Router(config-ptp-clk)# clock-port slaveport slave
Router(config-ptp-port)# transport ipv4 unicast interface GigabitEthernet3/0/1 negotiation
Router(config-ptp-port)# clock source 103.113.0.1
```

## Related Commands

Command	Description
<b>clock-port</b>	Specifies the mode of a PTP clock port.

# continuity-check

To enable the transmission of continuity check messages (CCMs), use the **continuity-check** command in Ethernet connectivity fault management (CFM) service configuration mode. To disable message transmission, use the **no** form of this command.

**continuity-check** [*interval time* | **loss-threshold** *threshold* | **static rmep**]

**no continuity-check** [*interval time* | **loss-threshold** | **static rmep**]

Syntax Description	
<b>interval</b>	(Optional) Configures the time period between message transmissions.
<i>time</i>	(Optional) Time period between message transmissions. Valid values are as follows: <ul style="list-style-type: none"> <li>• 100ms—100 milliseconds</li> <li>• 10m—10 minutes</li> <li>• 10ms—10 milliseconds</li> <li>• 10s—10 seconds</li> <li>• 1m—1 minute</li> <li>• 1s—1 second</li> <li>• 3.3ms—3.3 milliseconds</li> </ul> The values supported are platform dependent. For the Cisco Catalyst 6500 series switch, the values supported are 10m, 10s, and 1m.
<b>loss-threshold</b>	(Optional) Sets the number of CCMs that should be missed before declaring that a remote maintenance endpoint (MEP) is down.
<i>threshold</i>	(Optional) Integer from 2 to 255. The default is 3.
<b>static</b>	(Optional) Verifies that the MEP received in the CCM is valid.
<b>rmep</b>	(Optional) MEP defined using the <b>mep mpid</b> command.

**Command Default** CCMs are not transmitted.

**Command Modes** Ethernet CFM service configuration (config-ecfm-srv)

Command History	Release	Modification
	12.2(33)SXI2	This command was introduced.
	12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.

**Usage Guidelines** The static MEP list configured using the **mep mpid** command is used to verify whether a MEP received in a CCM is valid. If the MEP in the received CCM is not configured in the MEP list, an error CCM received fault alarm is set.

Output of the **show running all** command displays “continuity-check interval 1s” when the default interval period is configured and “continuity-check loss-threshold 3” when the default loss threshold is configured.

---

**Examples**

The following example shows how to configure a loss threshold of 50 CCMs:

```
Router(config)# ethernet cfm domain operatorA level 5
Router(config-ecfm)# service vlan-id 10 port
Router(config-ecfm-srv)# continuity-check loss-threshold 50
```

---

**Related Commands**

Command	Description
<b>mep mpid</b>	Statically defines MEPs within a maintenance association.
<b>show running all</b>	Shows the running configuration with default values.

## cos (CFM)

To set the class of service (CoS) for a maintenance endpoint (MEP) that will be sent in Ethernet connectivity fault management (CFM) messages, use the **cos** command in the Ethernet CFM interface configuration mode. To set the CoS to the highest priority allowed on the interface, use the **no** form of this command.

**cos** *cos-value*

**no cos**

### Syntax Description

<i>cos-value</i>	Integer from 0 to 7 that identifies the CoS. The default is 0.
------------------	--

### Command Default

If this command is not configured, the default CoS value is used.

### Command Modes

Ethernet CFM interface configuration (config-if-ecfm-mep)

### Command History

Release	Modification
12.2(33)SXI2	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.
15.1(1)T	This command was integrated into Cisco IOS Release 15.1(1)T.

### Usage Guidelines

This command is used to set the priority of messages.

CoS may not be supported on all platforms.

### Examples

The following example shows how to set the CoS to 5:

```
Router(config)# ethernet cfm domain test level 5
Router(config-ecfm)# service vlan-id 17 vlan 17
Router(config-ecfm-srv)# end
Router# configure terminal
Router(config)# interface gigabitethernet 0/2
Router(config-if)# ethernet cfm mep domain test mpid 5 vlan 17
Router(config-if-ecfm-mep)# cos 5
```

# delay-req interval

To specify a recommended interval for Precision Time Protocol member devices to send delay request messages, use the **delay-req interval** command in PTP clock port configuration mode. To remove a delay request interval configuration, use the **no** form of this command.

**delay-req interval** *interval-value* **unicast**

**no delay-req interval** *interval-value* **unicast**

## Syntax Description

<i>interval-value</i>	Specifies the length of the interval for delay request messages. The intervals are set using log base 2 values, as follows: <ul style="list-style-type: none"> <li>• 4—1 packet every 16 seconds</li> <li>• 3—1 packet every 8 seconds</li> <li>• 2—1 packet every 4 seconds</li> <li>• 1—1 packet every 2 seconds</li> <li>• 0—1 packet every second</li> <li>• -1—1 packet every 1/2 second, or 2 packets per second</li> <li>• -2—1 packet every 1/4 second, or 4 packets per second</li> <li>• -3—1 packet every 1/8 second, or 8 packets per second</li> <li>• -4—1 packet every 1/16 seconds, or 16 packets per second.</li> <li>• -5—1 packet every 1/32 seconds, or 32 packets per second.</li> <li>• -6—1 packet every 1/64 seconds, or 64 packets per second.</li> </ul> <p>The recommended value is -6.</p>
<b>unicast</b>	(Optional) Specifies that the device send PTP delay request messages using unicast mode.

## Command Default

The default value is -4 (16 packets per second).

## Command Modes

PTP clock-port configuration (config-ptp-port)

## Command History

Release	Modification
15.0(1)S	This command was introduced.

## Usage Guidelines

This configuration is only required when an interface is in PTP slave mode.

---

**Examples**

The following example shows how to use the **delay-req** command:

```
Router# configure terminal
Router(config)# ptp clock ordinary domain 0
Router(config-ptp-clk)# clock-port slaveport slave
Router(config-ptp-port)# delay-req interval 2 unicast
Router(config-ptp-port)# end
```

---

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>clock-port</b>	Specifies the mode of a PTP clock port.

## description (mac-tunnel)

To describe the name and purpose of a MAC tunnel or a service instance under a MAC tunnel, use the **description** command in either MAC-in-MAC tunnel configuration mode or MAC tunnel service configuration mode. To remove a description, use the **no** form of this command.

**description** *description*

**no description** *description*

### Syntax Description

<i>description</i>	String of a maximum of 240 characters.
	<ul style="list-style-type: none"> <li>In MAC-in-MAC tunnel configuration mode, the description is of the MAC tunnel.</li> <li>In MAC tunnel service configuration mode, the description is of the service instance.</li> </ul>

### Command Default

MAC tunnels or a service instances under MAC tunnels do not have descriptions.

### Command Modes

MAC-in-MAC tunnel configuration (config-tunnel-minm)  
MAC tunnel service configuration (config-tunnel-srv)

### Command History

Release	Modification
12.2(33)SRE	This command was introduced.

### Usage Guidelines

Use this command to identify and describe the type of service for which the MAC tunnel is used.

### Examples

The following example shows how to add descriptions for both a MAC tunnel and a service instance under that MAC tunnel:

```
Router(config)# ethernet mac-tunnel virtual 100
Router(config-tunnel-minm)# description MAC-Tunnel-100
Router(config-tunnel-minm)# service instance 1 ethernet
Router(config-tunnel-srv)# description ServInst-1
```

## disable (CFM-AIS-link)

To disable the generation of Alarm Indication Signal (AIS) frames resulting from a link-status change (server maintenance endpoint [SMEP]), use the **disable** command in CFM SMEP AIS configuration mode (config-ais-link-cfm). To enable AIS frame generation, use the **no** form of this command.

**disable**

**no disable**

**Syntax Description** This command has no arguments or keywords.

**Command Default** AIS frames are generated.

**Command Modes** CFM SMEP AIS configuration mode (config-ais-link-cfm)

Command History	Release	Modification
	12.2(33)SRD	This command was introduced.
	15.0(1)XA	This command was integrated into Cisco IOS Release 15.0(1)XA.

**Usage Guidelines** When the default value is configured, “no disable” is displayed when the **show running all** command is issued.

**Examples** The following example shows how to disable AIS frame generation after a link-status change:

```
Router(config)# ethernet cfm ais link-status global
Router(config-ais-link-cfm)# disable
```

Related Commands	Command	Description
	<b>show running all</b>	Displays the running configuration with default values.

# encapsulation dot1ah isid

To configure dot1ah encapsulation for a specific service instance ID (I-SID), use the **encapsulation dot1ah isid** command in MAC tunnel service configuration mode. To remove dot1ah encapsulation for an I-SID, use the **no** form of this command.

```
encapsulation dot1ah isid isid
```

```
no encapsulation dot1ah isid isid
```

## Syntax Description

<i>isid</i>	Integer from 1 to 16777215 that identifies the I-SID.
-------------	---

## Command Default

Encapsulation is not configured.

## Command Modes

MAC tunnel service configuration (config-tunnel-srv)

## Command History

Release	Modification
12.2(33)SRE	This command was introduced.

## Usage Guidelines

The I-SID is used to indicate a service in the provider backbone bridge (PBB) network. You can define the service, which can be a customer or a particular customer and type of data; for example, voice or video.

## Examples

The following example shows how to configure dot1ah encapsulation for I-SID 500:

```
Router(config)# ethernet mac-tunnel virtual 1
Router(config-tunnel-mimn)# service instance 1 ethernet
Router(config-tunnel-srv)# encapsulation dot1ah isid 500
```

# errdisable recovery cause mac-security

To enable automatic recovery of a service instance after a MAC security violation, use the **errdisable recovery cause mac-security** command in service instance configuration mode. To disable the automatic recovery mechanism, use the **no** form of this command.

**errdisable recovery cause mac-security** *interval*

**no errdisable recovery cause mac-security** *interval*

<b>Syntax Description</b>	<i>interval</i>	Time, in seconds, to recover from a MAC security violation. Range is 30 to 86400.
---------------------------	-----------------	---

<b>Command Default</b>	Automatic recovery of a service instance is disabled.
------------------------	---

<b>Command Modes</b>	Service instance configuration (config-if-srv)
----------------------	--

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.2(33)SRD	This command was introduced.

<b>Usage Guidelines</b>	<p>A cause is the reason why the error-disabled state occurred. When a cause is detected on a service instance, the service instance is placed in the error-disabled state (an operational state that is similar to the shutdown state). When you enable automatic error recovery, the service instance is brought out of the error-disabled state and allowed to retry the operation after all the causes have timed out. If you do not enable automatic error recovery, the service instance stays in the error-disabled state until the <b>shutdown</b> and <b>no shutdown</b> commands are issued.</p>
-------------------------	--

Alternatively, you can use the **clear ethernet service instance** command to bring the service instance out of the error-disabled state.

<b>Examples</b>	<p>The following example shows how to enable the automatic recovery of service instance 200 after a MAC security violation and to specify a recovery time of 30 seconds.</p>
-----------------	--

```
Router> enable
Router# configure terminal
Router(config)# interface gigabitethernet 3/0/1
Router(config-if)# service instance 200 ethernet
Router(config-if-srv)# encapsulation dot1Q 200
Router(config-if-srv)# bridge-domain 100
Router(config-if-srv)# mac security
Router(config-if-srv)# errdisable recovery cause mac-security 30
```

Related Commands	Command	Description
	<b>clear ethernet service instance</b>	Clears the Ethernet service instance error-disable state.
	<b>show ethernet service instance</b>	Displays information about Ethernet service instances.

# errdisable recovery cause mlacp-minlink

To enable automatic recovery from a failover state of the port channel, use the **errdisable recovery cause mlacp-minlink** command in global configuration mode. To disable this command, use the **no** form of this command.

**errdisable recovery cause mlacp-minlink**

**[no] errdisable recovery cause mlacp-minlink**

## Syntax Description

This command has no arguments or keywords.

## Command Default

This command is disabled by default. If the **errdisable recovery cause mlacp-minlink** is not enabled, the links stay in the ERR\_DISABLE state until a shut/no shut is entered on the links.

## Command Modes

Global config (config)

## Command History

Release	Modification
12.2(33)SRE	This command was introduced.

## Usage Guidelines

Use the **errdisable recovery cause mlacp-minlink** command to enable automatic recovery on the interface from the ERR\_DISABLE state. This command tries to bring the port-channel interface out of the ERR\_DISABLE state and retry operation after all the causes have timed out. To set the interval for recovery, configure the **errdisable recovery interval** command.

## Examples

The following example shows how to enable recovery from the ERR\_DISABLE state and set the interval to 100 seconds:

```
errdisable recovery cause mlacp-minlink
errdisable recovery interval 100
```

## Related Commands

Command	Description
<b>lacp failover</b>	Sets the mLACP switchover to non-revertive or brute force.
<b>errdisable recovery interval</b>	Sets the interval time for recovery from the ERR_DISABLE state.

# ethernet cfm ais

To configure Alarm Indication Signal (AIS) generation from a server maintenance endpoint (SMEP), use the **ethernet cfm ais** command in global configuration mode. To disable AIS generation from a SMEP, use the **no** form of this command.

```
ethernet cfm ais {domain domain-name {evc name | vlan {vlan-id | ,vlan-id | vlan-id-vlan-id |
, vlan-id-vlan-id} | link-status {global}}
```

```
no ethernet cfm ais {domain domain-name {evc name | vlan {vlan-id | ,vlan-id | vlan-id-vlan-id |
, vlan-id-vlan-id} | link-status {global}}
```

## Syntax Description

<b>domain</b>	Indicates that a maintenance domain is specified.
<i>domain-name</i>	String of a maximum of 154 characters that identifies the domain.
<b>evc</b>	Indicates that an Ethernet virtual circuit (EVC) is specified.
<i>name</i>	String identifying the EVC name.
<b>vlan</b>	Indicates that a VLAN is specified.
<i>vlan-id</i>	Integer in the range 1 to 4094 identifying the VLAN.
, <i>vlan-id</i>	Integers in the range 1 to 4094, separated by commas, that list VLANs to be enabled.
<i>vlan-id-vlan-id</i>	Integers in the range 1 to 4094 that define a range of VLANs to be enabled. The hyphen is required to separate starting and ending values that define the range.
, <i>vlan-id-vlan-id</i>	Integers in the range 1 to 4094 that define a list of VLAN ranges to be enabled. The comma must be entered to separate ranges. The hyphen is required to separate starting and ending values that are used to define each range of VLANs to be enabled.
<b>link-status</b>	Enables or disables AIS generation from a SMEP on an interface supporting 802.3ah interworking.
<b>global</b>	Places the CLI in Ethernet CFM AIS MEP configuration mode to configure AIS specific commands for a SMEP with 802.3ah interworking.

## Command Default

AIS generation is enabled.

## Command Modes

Global configuration (config)

## Command History

Release	Modification
12.2(33)SRD	This command was introduced.

## Usage Guidelines

The **ethernet cfm ais** command allows you to configure, enable, or disable AIS generation from a MEP or SMEP. To change default values for AIS generation on a SMEP, use the **link-status global** keywords. To change default values for AIS generation on a MEP, use the **domain** keyword.

---

**Examples**

The following example shows how to specify AIS generation on a domain named PROVIDER and VLAN 10:

```
Router(config)# ethernet cfm ais domain PROVIDER vlan 10
```

The following example shows how to enable AIS generation and place the CLI in CFM SMEP AIS configuration mode:

```
Router(config)# ethernet cfm ais link-status global  
Router(config-ais-mep-cfm) #
```

---

**Related Commands**

Command	Description
<b>clear ethernet cfm ais</b>	Clears a MEP or SMEP of the AIS defect condition.

# ethernet cfm ais link-status

To enable Alarm Indication Signal (AIS) generation from a server maintenance endpoint (SMEP), use the **ethernet cfm ais link-status** command in interface configuration mode. To disable AIS generation, use the **no** form of this command.

```
ethernet cfm ais link-status [level level-id | period seconds]
```

```
no ethernet cfm ais link-status [level | period]
```

## Syntax Description

<b>level</b>	(Optional) Indicates a maintenance domain level where the AIS will be sent.
<i>level-id</i>	(Optional) Integer from 0 to 7 that identifies the maintenance level.
<b>period</b>	(Optional) Configures the AIS transmission period generated by the SMEP on the interface.
<i>seconds</i>	(Optional) Integer value 1 or 60 that indicates the AIS transmission period in seconds. The default is 60.

## Command Default

AIS frames are not generated.

## Command Modes

Interface configuration (config-if)

## Command History

Release	Modification
15.0(1)XA	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.

## Usage Guidelines

This command has precedence over the **ethernet cfm ais link-status global** command issued in global configuration mode.

## Examples

The following example shows how to configure AIS generation with a transmission period of 60 seconds:

```
Router(config-if)# ethernet cfm ais link-status period 60
```

## Related Commands

Command	Description
<b>ethernet cfm ais link-status global</b>	Globally enables AIS generation and places the CLI in CFM SMEP AIS configuration mode.

# ethernet cfm ais link-status global

To globally enable Alarm Indication Signal (AIS) generation and place the command-line interface (CLI) in CFM SMEP AIS configuration mode (config-ais-link-cfm) to configure AIS commands for a server maintenance endpoint (SMEP), use the **ethernet cfm ais link-status global** command in global configuration mode. To remove the global AIS configuration, use the **no** form of this command.

**ethernet cfm ais link-status global**

**no ethernet cfm ais link-status global**

**Syntax Description** This command has no arguments or keywords.

**Command Default** AIS generation is enabled.

**Command Modes** Global configuration (config)

Command History	Release	Modification
	12.2(33)SRD	This command was introduced.
	15.0(1)XA	This command was integrated into Cisco IOS Release 15.0(1)XA.

**Usage Guidelines** The **ethernet cfm ais link-status global** command changes configuration modes to allow you to configure AIS commands for a SMEP.

**Examples** The following example shows how to configure AIS commands for a SMEP:

```
Router(config)# ethernet cfm ais link-status global
Router(config-ais-link-cfm)#
```

# ethernet cfm alarm

To configure an alarm for Ethernet connectivity fault management (CFM), use the **ethernet cfm alarm** command in global configuration mode. To restore the command options' default values, use the **no** form of this command.

```
ethernet cfm alarm {delay milliseconds | notification {all | error-xcon | mac-remote-error-xcon | none | remote-error-xcon | xcon} | packet max-num | reset milliseconds}
```

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

## Syntax Description

<b>delay</b>	Sets a delay time value during which one or more defects must be present before a fault alarm is issued.
<i>milliseconds</i>	Integer from 2500 to 10000 that specifies the number of milliseconds (ms) for either a delay or a reset of an alarm. <ul style="list-style-type: none"> <li>The default is 2500 for the <b>delay</b> option. The default is 10000 for the <b>reset</b> option.</li> </ul>
<b>notification</b>	Sets the defects that are to be reported if fault alarms are enabled. This configuration is global and can be overridden by the fault alarm configurations on a supported interface.
<b>all</b>	Reports all defects: DefRDI, DefMACStatus, DefRemote, DefError, and DefXcon.
<b>error-xcon</b>	Reports only DefError and DefXcon defects.
<b>mac-remote-error-xcon</b>	Reports only DefMACStatus, DefRemote, DefError, and DefXcon (default) defects. This option is the default.
<b>none</b>	No defects are reported.
<b>remote-error-xcon</b>	Reports only DefRemote, DefError, and DefXcon defects.
<b>xcon</b>	Reports only DefXcon defects.
<b>packet</b>	Reports DefError and DefXcon fault alarm packets.
<i>max-num</i>	Integer from 1 to 65535 that specifies the maximum number of DefError and DefXcon packets. The default is 0.
<b>reset</b>	Sets a reset time value during which, after a fault alarm, no defects must be present before another fault alarm is enabled.

## Command Default

Ethernet CFM alarms are disabled.

## Command Modes

Global configuration (config)

## Command History

Release	Modification
12.2(33)SX12	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.

Release	Modification
12.2(54)SE	This command was modified. Support for the <b>packet</b> keyword and <i>max-num</i> argument was added.
15.1(1)S	This command was integrated into Cisco IOS Release 15.1(1)S.

### Usage Guidelines

If a higher priority defect occurs after a lower priority defect has triggered an alarm but before the alarm has reset, immediately issue another fault alarm for the higher priority defect.

Output of the **show running all** command displays “ethernet cfm alarm delay 2500” when the default value for the delay option is configured and “ethernet cfm alarm reset 10000” when the default value for the reset option is configured.

### Examples

The following example shows how to set up notification for all defects:

```
Router(config)# ethernet cfm alarm notification all
```

The following example shows how to set the time during which one or more defects must be present before a fault alarm is issued to 5000 ms:

```
Router(config)# ethernet cfm alarm delay 5000
```

The following example shows how to set the maximum number of DefError and DefXcon fault alarm packets to 6500:

```
Router(config)# ethernet cfm alarm packet 6500
```

### Related Commands

Command	Description
<b>show running all</b>	Displays the running configuration with default values.

## ethernet cfm cc

To set parameters for continuity check messages (CCMs), use the **ethernet cfm cc** command in global configuration mode. To reset parameters to their default values, use the **no** form of this command.

```
ethernet cfm cc level { any | level-id | level-id-level-id | [,level-id-level-id] } { evc evc-name | vlan
  { vlan-id | any | vlan-id-vlan-id | [,vlan-id-vlan-id] } } [interval seconds] [loss-threshold
  num-msgs]
```

```
no ethernet cfm cc level { any | level-id | level-id-level-id | [,level-id-level-id] } { evc evc-name | vlan
  { vlan-id | any | vlan-id-vlan-id | [,vlan-id-vlan-id] } } [interval seconds] [loss-threshold
  num-msgs]
```

### Syntax Description

<b>level</b>	Indicates a maintenance level for the configuration.
<b>any</b>	Indicates that all levels are to be configured.
<i>level-id</i>	Integer from 0 to 7 that identifies a maintenance level.
<i>level-id-level-id</i>	Integers from 0 to 7 that define a range of levels to be configured. The hyphen is required to separate starting and ending values that define the range.
<i>,level-id-level-id</i>	(Optional) Integers from 0 to 7 that define a list of ranges to be configured. The comma must be entered to separate ranges. The hyphen is required to separate starting and ending values that are used to define each range of levels to be configured.
<b>evc</b>	Indicates an Ethernet virtual circuit (EVC) is configured.
<i>evc-name</i>	String that identifies the EVC.
<b>vlan</b>	Indicates a VLAN for configuration.
<i>vlan-id</i>	Integer from 1 to 4094 that identifies a VLAN to be configured.
<b>any</b>	Indicates that all VLANs are to be configured.
<i>vlan-id-vlan-id</i>	Integers from 1 to 4094 that define a range of VLANs to be configured. The hyphen is required to separate starting and ending values that are used to define the range.
<i>,vlan-id-vlan-id</i>	(Optional) Integers from 1 to 4094 that define a list of VLAN ranges to be configured. The comma must be entered to separate ranges. The hyphen is required to separate starting and ending values that are used to define each range of VLANs.
<b>interval</b>	(Optional) Specifies, in seconds, the time between CCM transmissions.
<i>seconds</i>	(Optional) Integer value in the range of 10 to 65535. The default is 30.
<b>loss-threshold</b>	(Optional) Indicates the maximum number of CCMs that can be missed before declaring that a maintenance endpoint (MEP) is down.
<i>num-msgs</i>	(Optional) Integer in the range of 2 to 255 that specifies the maximum number of CCMs that can be lost before a MEP is declared down. The default is 2.

### Command Default

For all maintenance levels and VLANs configured on a device, the interval is 30 seconds and the loss-threshold is 2.

**Command Modes** Global configuration (config)

Command History	Release	Modification
	12.2(33)SRA	This command was introduced.
	12.4(11)T	This command was integrated into Cisco IOS Release 12.4(11)T.
	12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
	12.2(33)SRD	This command was modified. The <b>evc</b> keyword and <i>evc-name</i> argument were added on the Cisco 7600 Series Route Switch Processor 720 (RSP 720) and the Cisco 7600 Series Supervisor Engine 720.
	15.1(1)T	This command was integrated into Cisco IOS Release 15.1(1)T.

**Usage Guidelines** The **ethernet cfm cc** command is used to set parameters for generating and receiving CCMs in one of the following ways:

- Globally (per device)
- For a maintenance domain
- For a particular customer service instance (CSI)
- For a combination of maintenance domain and CSI

When the **ethernet cfm cc** command is issued, the system may perform optimizations by concatenating possible ranges, and the configuration may not go through nonvolatile generation (NVGEN) as it was originally entered.

If you configure the **ethernet cfm cc** command with the default values for interval and loss threshold, these parameters will not display after NVGEN. If you configure the command with at least one parameter not at the default value, all parameters are displayed.

An EVC is an association of two or more user network interfaces (UNIs).



**Note**

This command is not supported in the Connectivity Fault Management 802.1ag Standard (CFM IEEE).

**Examples**

The following example shows how to configure an Ethernet CFM level ID of 5 for all VLANs, with messages transmitted every 30 seconds and a remote MEP declared down after two messages are missed. Note that the interval and loss-threshold parameters are configured for the default values and do not display after NVGEN.

```
Router(config)# ethernet cfm cc level 5 vlan any interval 30 loss-threshold 2
(NVGEN)ethernet cfm cc level 5 vlan any
```

The following example shows how to configure an Ethernet CFM level ID of 5 for all VLANs, with messages transmitted every 1000 seconds and a remote MEP declared down after two messages (the default value) are missed:

```
Router(config)# ethernet cfm cc level 5 vlan any interval 1000 loss-threshold 2
(NVGEN)ethernet cfm cc level 5 vlan any interval 1000
```

The following example shows how to configure an Ethernet CFM level ID of 5 for all VLANs, with messages transmitted every 1000 seconds and a remote MEP declared down after 7 messages are missed (neither value is a default value):

```
Router(config)# ethernet cfm cc level 5 vlan any interval 1000 loss-threshold 7  
(NVGEN)ethernet cfm cc level 5 vlan any interval 1000 loss-threshold 7
```

The following example shows how to configure Ethernet CFM for multiple levels for VLANs 100 to 200 with messages transmitted every 50 seconds and a remote MEP declared down after 5 messages are missed (neither value is a default value):

```
Router(config)# ethernet cfm cc level 1-5 vlan 100-200 interval 50 loss-threshold 5  
Router(config)# no ethernet cfm cc level 2-3 vlan 50-150 interval 50 loss-threshold 5  
(NVGEN)ethernet cfm cc level 2-3 vlan 151-200 interval 50 loss-threshold 5  
ethernet cfm cc level 1,4-5 vlan 100-200 interval 50 loss-threshold 5
```

The following example shows how to configure Ethernet CFM level ID of 5 for EVC evc5, with messages transmitted every 50 seconds and a remote MEP declared down after 3 messages are missed (neither value is a default value):

```
Router(config)# ethernet cfm cc level 5 evc evc5 interval 50 loss-threshold 3  
(NVGEN)ethernet cfm cc level 5 evc evc5 interval 50 loss-threshold 3
```

# ethernet cfm cc enable level evc

To globally enable transmission of continuity check messages (CCMs), use the **ethernet cfm cc enable level evc** command in global configuration mode. To disable transmission of CCMs, use the **no** form of this command.

```
ethernet cfm cc enable level { any | level-id | ,level-id | level-id-level-id | ,level-id-level-id } evc
    evc-name
```

```
no ethernet cfm cc enable level { any | level-id | ,level-id | level-id-level-id | ,level-id-level-id } evc
    evc-name
```

## Syntax Description

<b>any</b>	Enables CCMs for all levels.
<i>level-id</i>	Integer from 0 to 7 that identifies a maintenance level.
, <i>level-id</i>	Integers from 0 to 7, separated by commas, that list levels to be enabled.
<i>level-id-level-id</i>	Integers from 0 to 7 that define a range of levels to be enabled. The hyphen is required to separate starting and ending values that define the range.
, <i>level-id-level-id</i>	Integers from 0 to 7 that define a list of ranges to be enabled. The comma must be entered to separate ranges. The hyphen is required to separate starting and ending values that are used to define each range of levels to be enabled.
<i>evc-name</i>	String that identifies the Ethernet virtual circuit (EVC).

## Command Default

No CCMs are transmitted.

## Command Modes

Global configuration (config)

## Command History

Release	Modification
12.2(33)SRD	This command was introduced.

## Usage Guidelines

Use the **ethernet cfm cc enable level evc** command to enable transmission of CCMs in one of the following ways:

- Globally (per device)
- For a particular level
- For a particular EVC
- For a combination of level and EVC

---

**Examples**

The following example shows how to configure the **ethernet cfm cc enable level evc** command for EVC evc5:

```
Router (config)# ethernet cfm cc enable level 5 evc evc5
```

How you enter the **ethernet cfm cc enable level evc** command and the format you see in the configuration may be different. For example, if you enter:

```
Router(config)# ethernet cfm cc enable level 1,2,3,4,5 evc evc1
```

The configuration shows the following:

```
ethernet cfm cc enable level 1-5 evc evc1
```

To shorten the length of the command, you also can enter it as shown in the following example:

```
Router(config)# ethernet cfm cc enable level 1-5 evc evc1
```

---

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>ethernet cfm cc enable level vlan</b>	Enables transmission of CCMs.

---

# ethernet cfm cc enable level vlan

Use the **ethernet cfm cc enable level vlan** command in global configuration mode to globally enable transmission of continuity check messages (CCMs). To disable transmission of CCMs, use the **no** form of this command.

**ethernet cfm cc enable level** { **any** | *level-id* | ,*level-id* | *level-id-level-id* | ,*level-id-level-id* }  
**vlan** { **any** | *vlan-id* | ,*vlan-id* | *vlan-id-vlan-id* | ,*vlan-id-vlan-id* }

**no ethernet cfm cc enable level** { **any** | *level-id* | ,*level-id* | *level-id-level-id* | ,*level-id-level-id* }  
**vlan** { **any** | *vlan-id* | ,*vlan-id* | *vlan-id-vlan-id* | ,*vlan-id-vlan-id* }

## Syntax Description

<b>any</b>	Enables CCMs for all levels.
<i>level-id</i>	Integer from 0 to 7 that identifies a maintenance level.
, <i>level-id</i>	Integers from 0 to 7, separated by commas, that list levels to be enabled.
<i>level-id-level-id</i>	Integers from 0 to 7 that define a range of levels to be enabled. The hyphen is required to separate starting and ending values that define the range.
, <i>level-id-level-id</i>	Integers from 0 to 7 that define a list of ranges to be enabled. The comma must be entered to separate ranges. The hyphen is required to separate starting and ending values that are used to define each range of levels to be enabled.
<b>any</b>	Indicates all VLANs are to be configured.
<i>vlan-id</i>	Integer from 1 to 4094 that identifies a VLAN to be configured.
, <i>vlan-id</i>	Integers from 1 to 4094, separated by commas, that list VLANs to be configured.
<i>vlan-id-vlan-id</i>	Integers from 1 to 4094 that define a range of VLANs to be configured. The hyphen is required to separate starting and ending values that are used to define the range.
, <i>vlan-id-vlan-id</i>	Integers from 1 to 4094 that define a list of VLAN ranges to be configured. The comma must be entered to separate ranges. The hyphen is required to separate starting and ending values that are used to define each range of VLANs.

## Command Default

No CCMs are transmitted.

## Command Modes

Global configuration (config)

## Command History

Release	Modification
12.2(33)SRA	This command was introduced.
12.4(11)T	This command was integrated into Cisco IOS Release 12.4(11)T.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.

---

**Usage Guidelines**

Use the **ethernet cfm cc enable level vlan** command to enable transmission of CCMs in one of the following ways:

- Globally (per device)
- For a particular level
- For a particular VLAN
- For a combination of level and VLAN

How you enter the **ethernet cfm cc enable level vlan** command and the format you see in the configuration may be different. For example, if you enter:

```
Router(config)# ethernet cfm cc enable level 1,2,3,4,5 vlan 100,101,102,103,105
```

The configuration shows the following:

```
ethernet cfm cc enable level 1-5 vlan 100-103,105
```

To shorten the length of the command, you also can enter it this way.

---

**Examples**

The following examples show how this command functions:

1. The command already configured is:

```
ethernet cfm cc enable level 1-5 vlan 100-200
```

2. You configure this new command:

```
Router(config)# no ethernet cfm cc enable level 2-3 vlan 50-150
```

3. The following commands are generated as a result of the command you have just configured. Note that these commands are different from the command you entered.

```
ethernet cfm cc enable level 1,4-5 vlan 100-200  
ethernet cfm cc enable level 2-3 vlan 151-200
```

# ethernet cfm distribution enable

To enable the Ethernet connectivity fault management (CFM) distribution, use the **ethernet cfm distribution enable** command in the global configuration mode. To turn off distribution, use the **no** form of this command.

**ethernet cfm distribution enable**

**no ethernet cfm distribution enable**

**Syntax Description** This command has no arguments or keywords.

**Command Default** Ethernet CFM distribution is off when this command is not configured.

**Command Modes** Global configuration (config)

Command History	Release	Modification
	15.1(2)S	This command was introduced.

**Usage Guidelines** On the Cisco 7600 router, this command must be configured before Ethernet performance monitoring (EPM) sessions are configured.

When you issue the **no ethernet cfm distribution enable** command, all EPM sessions on the route processor and on the line card are removed, but the IP SLA configurations remain. If you do not want any Y.1731 performance monitoring sessions, you must remove the IP SLA configurations. You can use the **ip sla reset** command to clear all the IP SLA configurations or you can clear each one individually.

**Examples** The following example shows how to enable Ethernet CFM distribution:

```
Router(config)# ethernet cfm distribution enable
```

# ethernet cfm domain level

To define a connectivity fault management (CFM) maintenance domain at a particular maintenance level and put the command-line interface (CLI) into Ethernet CFM configuration mode, use the **ethernet cfm domain level** command in global configuration mode. To remove the CFM domain at the specified level, use the **no** form of this command.

**ethernet cfm domain** *domain-name* **level** *level-id* [**direction outward**]

**no ethernet cfm domain** *domain-name* **level** *level-id*

Syntax Description	
<i>domain-name</i>	String of a maximum of 154 characters that identifies the domain.
<i>level-id</i>	Integer from 0 to 7 that identifies the maintenance level.
<b>direction outward</b>	(Optional) Specifies the domain direction as outward (toward the wire). The default direction is inward.
<b>Note</b>	The outward keyword is supported only in Cisco IOS Release 12.4(11)T and later releases. This keyword is not supported in Cisco IOS Release 12.2(33)SXH or 12.2(33)SXI2.

**Command Default** No maintenance domains are assigned to maintenance levels if this command is not issued.

**Command Modes** Global configuration (config)

Command History	Release	Modification
	12.2(33)SRA	This command was introduced.
	12.4(11)T	This command was integrated into Cisco IOS Release 12.4(11)T. The <b>direction outward</b> keywords were added.
	12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
	12.2(33)SXI2	This command was integrated into Cisco IOS Release 12.2(33)SXI2.

**Usage Guidelines** When a router is in Ethernet CFM configuration mode, parameters specific to a maintenance domain can be set. Several domains, with different names, can be configured at the same maintenance level; however, a single domain cannot be associated with multiple levels.

In CFM IEEE, if a domain name has more than 43 characters, a warning message is displayed notifying that the maintenance domain ID (MDID) will be truncated to 43 characters in continuity check messages if “id <fmt> <MDID>” is not configured.

When this command places the CLI in Ethernet configuration mode, in CFM D1 the mode prompt is “config-ether-cfm” and in CFM IEEE the mode prompt is “config-ecfm.”

**Examples**

The following example shows how to define an outward facing domain named domain1 at level 6 and that the CLI mode changes to Ethernet CFM configuration mode:

```
Router(config)# ethernet cfm domain domain1 level 6 direction outward
Router(config-ether-cfm)#
```

The following example shows how to define a domain named cust10 at level 5 and also shows the Ethernet CFM configuration mode prompt that is displayed in the CFM IEEE Standard implementation:

```
Router(config)# ethernet cfm domain cust10 level 5
Router(config-ecfm)#
```

**Related Commands**

Command	Description
<b>show ethernet cfm domain</b>	Displays information about maintenance points configured on a device.
<b>show ethernet cfm maintenance-points local</b>	Displays information about maintenance points configured on a device.

# ethernet cfm enable (interface)

To enable connectivity fault management (CFM) processing on an interface, use the **ethernet cfm enable** command in interface configuration mode. To disable CFM processing on an interface, use the **no** form of this command.

**ethernet cfm enable**

**no ethernet cfm enable**

## Syntax Description

This command has no arguments or keywords.

## Command Default

Ethernet CFM is enabled.

## Command Modes

Interface configuration (config-if)

## Command History

Release	Modification
12.2(33)SRA	This command was introduced.
12.4(11)T	This command was integrated into Cisco IOS Release 12.4(11)T.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.

## Usage Guidelines

Ethernet CFM is enabled by default on an interface and must be disabled explicitly. When CFM is disabled on an interface, hardware resources (for example, port-ASIC match-registers) are released for that interface.

This command is mutually exclusive of maintenance intermediate point (MIP) and maintenance end point (MEP) configuration commands. The interface must be enabled before any MEPs or MIPs can be configured. Similarly, disabling a port that has MIPs or MEPs configured is not allowed. The user must first unconfigure the maintenance points.

When CFM processing is disabled on an interface, all CFM frames that arrive at that interface are forwarded as normal data traffic, and are not processed by the CPU.

## Examples

The following example shows how to disable and then enable CFM processing on an interface:

```
Router(config-if)# no ethernet cfm enable
Router(config-if)# ethernet cfm enable
```

# ethernet cfm enable

To enable connectivity fault management (CFM) processing globally on a device, use the **ethernet cfm enable** command in global configuration mode. To disable CFM processing globally on a device, use the **no** form of this command.

**ethernet cfm enable**

**no ethernet cfm enable**

**Syntax Description** This command has no arguments or keywords.

**Command Default** Ethernet CFM is disabled.

**Command Modes** Global configuration (config)

## Command History

Release	Modification
12.2(33)SRA	This command was introduced.
12.4(11)T	This command was integrated into Cisco IOS Release 12.4(11)T.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.

## Usage Guidelines

Ethernet CFM is disabled by default and must be enabled explicitly. When CFM is configured, hardware resources (for example, port-ASIC match-registers) are allocated for CFM.

## Examples

The following example shows how to enable CFM processing globally on a device:

```
Router(config)# ethernet cfm enable
```

# ethernet cfm global

To enable Ethernet connectivity fault management (CFM) globally on a device, use the **ethernet cfm global** command in global configuration mode. To disable CFM globally on a device, use the **no** form of this command.

**ethernet cfm global**

**no ethernet cfm global**

**Syntax Description** This command has no arguments or keywords.

**Command Default** Ethernet CFM is disabled.

**Command Modes** Global configuration (config)

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.2(33)SXI2	This command was introduced.
	12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.

**Usage Guidelines** Ethernet CFM is disabled by default and must be enabled explicitly. When CFM is configured, hardware resources (for example, port-ASIC match registers) are allocated for CFM.

This command is supported only in the Ethernet CFM IEEE 802.1ag Standard implementation.

**Examples** The following example shows how to enable CFM globally on a device:

```
Router(config)# ethernet cfm global
```

# ethernet cfm ieee

To enable the Ethernet Connectivity Fault Management 802.1ag Standard (CFM IEEE) version of CFM, use the **ethernet cfm ieee** command in global configuration mode. To disable the CFM IEEE version, use the **no** form of this command.

**ethernet cfm ieee**

**no ethernet cfm ieee**

**Syntax Description** This command has no arguments or keywords.

**Command Default** Ethernet CFM IEEE is disabled.

**Command Modes** Global configuration (config)

## Command History

Release	Modification
12.2(33)SX12	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.

## Usage Guidelines

This command is auto-generated when CFM is enabled and running IEEE CFM. In Cisco pre-Standard CFM Draft 1 (CFM D1), this command is not supported.

## Examples

The following example shows how to enable Ethernet CFM IEEE:

```
Router(config)# ethernet cfm ieee
```

# ethernet cfm interface

To enable Ethernet connectivity fault management (CFM) processing on a port, use the **ethernet cfm interface** command in interface configuration mode. To disable Ethernet CFM processing, use the **no** form of this command.

**ethernet cfm interface**

**no ethernet cfm interface**

---

**Syntax Description** This command has no arguments or keywords.

---

**Command Default** CFM processing is enabled.

---

**Command Modes** Interface configuration (config-if)

---

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.2(33)SXI2	This command was introduced.
	12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.

---

---

**Usage Guidelines** This command is mutually exclusive of the maintenance intermediate point (MIP) and maintenance endpoint (MEP) configuration commands. A port must be enabled before any MEPs or MIPs can be configured. Similarly, maintenance points must be unconfigured before a port configured with MIPs or MEPs can be disabled.

When CFM processing is disabled on a port, all CFM frames that arrive at that port are dropped and are not processed by the CPU.

CFM is enabled by default on a port and must be disabled explicitly. When CFM is disabled on a port, hardware resources such as port-ASIC match registers are released for that port.

---

**Examples** The following example shows how to configure an Ethernet interface for CFM processing:

```
Router(config-if)# ethernet cfm interface
```

# ethernet cfm logging

To enable Ethernet Connectivity Fault Management (CFM) syslog messages, use the **ethernet cfm logging** command in global configuration mode. To disable CFM syslog messages, use the **no** form of this command.

## Cisco pre-Standard CFM Draft 1 (CFM D1)

```
ethernet cfm logging [ais | alarm { cisco | ieee}]
```

```
no ethernet cfm logging [ais | alarm { cisco | ieee}]
```

## CFM IEEE 802.1ag Standard (CFM IEEE)

```
ethernet cfm logging [ais | alarm { cisco | ieee } | lck]
```

```
no ethernet cfm logging [ais | alarm { cisco | ieee } | lck]
```

Syntax Description		
	<b>ais</b>	(Optional) Enables syslog messages specific to the CFM Alarm Indication Signal (AIS) feature.
	<b>alarm</b>	(Optional) Specifies an alarm.
	<b>cisco</b>	(Optional) Enables alarm syslog messages for Cisco MIBs.
	<b>ieee</b>	(Optional) Enables alarm syslog messages for IEEE MIBs for all VLAN services.
	<b>lck</b>	(Optional) Enables syslog messages specific to the CFM Locked Signal function (LCK).

**Command Default** CFM logging is not enabled.

**Command Modes** Global configuration (config)

Command History	Release	Modification
	12.2(33)SRD	This command was introduced.
	12.2(33)SX12	This command was integrated into Cisco IOS Release 12.2(33)SX12.

**Examples** The following example shows how to enable all Ethernet CFM syslog messages:

```
Router(config)# ethernet cfm logging
```

The following example shows how to enable all alarm syslog messages for Cisco MIBs:

```
Router(config)# ethernet cfm logging alarm cisco
```

The following example shows how to enable syslog messages specific to the CFM AIS feature:

```
Router(config)# ethernet cfm logging ais
```

