

# ethernet cfm mep crosscheck

To enable cross-checking between the list of configured remote maintenance endpoints (MEPs) of a domain and MEPs learned through continuity check messages (CCMs), use the **ethernet cfm mep crosscheck** command in privileged EXEC mode. To disable cross-checking, use the **ethernet cfm mep crosscheck disable** command.

## Cisco pre-Standard Connectivity Fault Management Draft 1 (CFM D1)

```
ethernet cfm mep crosscheck {enable | disable} level {level-id | level-id-level-id
[,level-id-level-id]} {vlan {vlan-id | any | vlan-id-vlan-id [ ,vlan-id-vlan-id]} | evc evc-name}
```

## CFM IEEE 802.1ag Standard (CFM IEEE)

```
ethernet cfm mep crosscheck {enable | disable} domain domain-name {port | vlan {vlan-id |
vlan-id-vlan-id | ,vlan-id-vlan-id}}
```

### Syntax Description

<b>enable</b>	Indicates that cross-checking will occur.
<b>disable</b>	Indicates that cross-checking will not occur.
<b>level</b>	Indicates a maintenance level for configuration.
<i>level-id</i>	Integer from 0 to 7 that identifies the maintenance level.
<i>level-id-level-id</i>	Integer values from 0 to 7. The hyphen is required to separate starting and ending level ID values that are used to define the range of IDs.
<i>,level-id-level-id</i>	(Optional) Integer values from 0 to 7. The comma must be entered to separate level ID ranges. The hyphen is required to separate starting and ending level ID values that are used to define each range of IDs.
<b>vlan</b>	Indicates a VLAN for cross-checking.
<i>vlan-id</i>	Integer from 1 to 4094 that identifies the VLAN.
<b>any</b>	Indicates all VLANs are to be configured. <ul style="list-style-type: none"> <li>This option is supported only in CFM D1.</li> </ul>
<i>vlan-id-vlan-id</i>	Integer values from 1 to 4094. The hyphen is required to separate starting and ending VLAN ID values that are used to define a range of IDs.
<i>,vlan-id-vlan-id</i>	(Optional) Integer values from 1 to 4094. The comma must be entered to separate VLAN ID ranges. The hyphen is required to separate starting and ending VLAN ID values that are used to define each range of IDs.
<b>evc</b>	Identifies the Ethernet virtual circuit (EVC). <ul style="list-style-type: none"> <li>This option is supported only in CFM D1.</li> </ul>
<i>evc-name</i>	String that identifies the EVC. <ul style="list-style-type: none"> <li>This option is supported only in CFM D1.</li> </ul>
<b>domain</b>	Specifies a maintenance domain.
<i>domain-name</i>	String of a maximum of 154 characters that identifies the maintenance domain.
<b>port</b>	Specifies a DOWN service direction with no VLAN associations (untagged).

**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)SRD	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.
	12.2(33)SXI2	This command was integrated into Cisco IOS Release 12.2(33)SXI2.

**Usage Guidelines** Before you issue this command, you must configure a static list of MEPs using the **mep crosscheck mpid vlan** command. To enable cross-checking after a device has booted up, you must issue the **ethernet cfm mep crosscheck enable** command.

A **no** form of this command does not exist. Cross-checking is disabled when you issue the command with the **disable** keyword.

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.

To view the results of a cross-check operation, use the **show ethernet cfm maintenance-points remote crosscheck** command. To view errors in the cross-check operation, use the **show ethernet cfm errors** command. Both commands are used in privileged EXEC mode.

Traps are generated after a cross-check operation is completed if cross-check traps are already enabled and, if as the result of the cross-check operation, a condition warrants a trap to be sent.

An EVC is an association of two or more user network interfaces (UNIs). EVCs are not supported in Cisco IOS Release 12.2(33)SXI2.

**Examples** The following example shows how to enable an Ethernet CFM MEP cross-check on a port MEP in CFM IEEE:

```
Router# ethernet cfm mep crosscheck enable domain customerA port
```

The following example shows how to enable an Ethernet CFM MEP cross-check in CFM D1 at level 2 for VLAN IDs in the range of 3000 to 3375:

```
Router# ethernet cfm mep crosscheck enable level 2 vlan 3000-3375
```

Related Commands	Command	Description
	<b>mep crosscheck mpid vlan</b>	Statically defines a remote MEP within a maintenance domain.
	<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.
	<b>show ethernet cfm maintenance-points remote crosscheck</b>	Displays detailed information about remote MEPs in the cross-check list that were statically configured.

# ethernet cfm mep crosscheck start-delay

To configure the maximum amount of time that a device waits for remote maintenance endpoints (MEPs) to come up before the cross-check operation is started, use the **ethernet cfm mep crosscheck start-delay** command in global configuration mode. To restore the default number of seconds a device waits, use the **no** form of this command.

**ethernet cfm mep crosscheck start-delay** *delay*

**no ethernet cfm mep crosscheck start-delay** *delay*

## Syntax Description

<i>delay</i>	Integer from 1 to 65535 that specifies the number of seconds a device waits for remote MEPs to come up before the cross-check is started. The default is 30.
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## Command Default

The start delay interval is enabled with a default of 30 seconds.

## 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)SXI2	This command was integrated into Cisco IOS Release 12.2(33)SXI2.

## Usage Guidelines

If continuity check intervals in your network are greater than 30 seconds (the delay default), you must configure the start-delay to match the greatest interval to avoid unnecessary traps.

When the default value is configured, “ethernet cfm mep crosscheck start-delay 30” is displayed when the **show running all** command is issued.

## Examples

The following example shows how to set the maximum number of seconds that a device will wait for remote MEPs to come up before the cross-check operation is started to 700:

```
Router(config)# ethernet cfm mep crosscheck start-delay 700
```

## Related Commands

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

# ethernet cfm mep domain mpid

To set a port as internal to a maintenance domain and define it as a maintenance endpoint (MEP), use the **ethernet cfm mep domain mpid** command in interface configuration mode. Also, use this command to place the command-line interface (CLI) in Ethernet connectivity fault management (CFM) MEP configuration mode (config-if-ecfm-mep). To restore the default configuration of the port, use the **no** form of this command.

```
ethernet cfm mep domain domain-name mpid mpid {port | vlan vlan-id}
```

```
no ethernet cfm mep domain domain-name mpid mpid {port | vlan vlan-id}
```

## Syntax Description

<i>domain-name</i>	String of a maximum of 154 characters.
<i>mpid</i>	Integer from 1 to 8191 that identifies the MEP.
<b>port</b>	Configures the DOWN service direction with no VLAN association (untagged).
<b>vlan</b>	Configures a VLAN.
<i>vlan-id</i>	Integer from 1 to 4094 that identifies a VLAN.

## Command Default

This command is disabled.

## Command Modes

Interface configuration (config-if)

## 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

A single interface may belong to multiple domains, meaning that you can issue multiple instances of the **ethernet cfm mep domain mpid** command for different domains.

If a specified domain has not been configured, an error message is displayed and the command is rejected.

If an interface is manually provisioned to have a maintenance intermediate point (MIP) at a certain maintenance level and you attempt to configure it as a MEP for a VLAN on the same or a higher level, an error message is displayed and the command is rejected.

If the VLAN for which a MEP is configured is removed from an interface, the MEP configuration is also removed; the VLAN and the definition of the MEP are interrelated.

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 (CCMs) if “id <fmt> <MDID>” is not configured.

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**Examples**

The following example shows how to set a port as internal to a maintenance domain, define it as a maintenance endpoint (MEP), and configure VLAN 17:

```
Router(config)# interface ethernet 0/1  
Router(config-if)# ethernet cfm mep domain CustomerB mpid 5 vlan 17
```

# ethernet cfm mep level mpid vlan

To set an interface as a domain boundary (edge), define it as a maintenance endpoint (MEP), and set direction for the MEP, use the **ethernet cfm mep level mpid vlan** command in interface configuration mode. To restore the default configuration of the interface, use the **no** form of this command.

```
ethernet cfm mep level level-id [inward | outward domain domain-name] mpid id vlan {any | vlan-id | ,vlan-id | vlan-id-vlan-id | ,vlan-id-vlan-id}
```

```
no ethernet cfm mep level level-id [inward | outward domain domain-name] mpid id vlan {any | vlan-id | ,vlan-id | vlan-id-vlan-id | ,vlan-id-vlan-id}
```

## Syntax Description

<i>level-id</i>	Integer from 0 to 7 that identifies the maintenance level at which the MEP is defined.
<b>inward</b>	(Optional) Indicates the direction of the MEP is toward the device. This is the default.
<b>outward</b>	(Optional) Sets an interface as outward (toward the wire).
<b>domain</b>	(Optional) Identifies the domain in which the MEP will be configured.
<i>domain-name</i>	(Optional) String of a maximum of 154 characters that identifies the domain.
<i>id</i>	Integer from 0 to 8191 that identifies the MEP.
<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 MEPs are configured until this command is issued.

## 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.  The <b>outward</b> and <b>domain</b> keywords and the <i>domain-name</i> argument were added.

Release	Modification
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
12.2(33)SRD	This command was modified. Support was added for outward facing MEPs on switch ports on Cisco 7600 series routers.

### Usage Guidelines

Following is the order in which you must configure Ethernet connectivity fault management (CFM) elements:

1. Domain at the same level as the MEP to be configured
2. Service within the domain
3. Maintenance intermediate point (MIP) at a level higher than the MEP if the domain is not an outward domain
4. MEP

If you do not configure elements in this sequence, the **ethernet cfm mep level mpid vlan** command will fail. An exception is at maintenance level 7, where configuring a MIP on the interface before you configure a MEP is not required. Configuring a MIP on an interface also is not required when you are configuring an outward facing MEP.

A single interface may belong to multiple domains, which means you can issue multiple instances of the **ethernet cfm mep level mpid vlan** command for different domains and for different VLANs.

More than one domain can be configured at a single level. The level plus VLAN indicates the domain to which the MEP belongs.

You can configure a single MEP, a list of MEPs, or a range of MEPs so that there is one MEP per VLAN and all MEPs share the same level, direction, and maintenance endpoint ID (MPID).

If the direction of the MEP is not stated, the default is inward facing (toward the Bridge). When you specify an outward MEP, you must provide a domain name. If the specified domain has not been configured or if the specified domain has not been tagged as outward, an error message will display and the command will be rejected.

All MEPs and MIPs must be removed from an interface before MEPs at level 7 can be configured. Also, when you remove MEP configurations at Level 7, you should first remove all lower level MEPs. If you try to configure a MEP on an interface with a level higher than the MIP level, the command will be rejected and an error message will be displayed.

If an interface is provisioned to be a MIP for a certain maintenance level and you try to configure the interface as an inward MEP for a VLAN at the same level, the command will be rejected and an error message will display. If a VLAN for which a MEP is configured is removed from an interface, the MEP configuration remains, but the MEP is inactive and does not transmit or receive messages because the definition of the MEP is associated with the VLAN.

### Examples

The following example shows how to set interface Ethernet 0/1 as a domain boundary and define it as a MEP at level 5, with a MPID of 5 on VLAN 101, and then issue the **show ethernet cfm maintenance-points local** command to display the list of configured MEPs in the device:

```
Router(config)# interface ethernet 0/1
Router(config-if)# ethernet cfm mep level 5 mpid 5 vlan 101
Router(config-if)# Ctrl-Z
Router(config)# show ethernet cfm maintenance-points local
```

The following example shows how to set interface Ethernet 0/1 as outward for maintenance domain domain1 and define it as a MEP at level 5 with the MEP ID 700 on VLAN 5:

```
Router(config)# interface ethernet 0/1
Router(config-if)# ethernet cfm mep level 5 outward domain domain1 mpid 700 vlan 5
```

The following example shows how to set interface Ethernet 5/0 as a domain boundary and define it as a MEP at level 7, with a MPID of 3001 on VLAN 100 on a switch port:

```
Router(config)# interface ethernet 5/0
Router(config-if)# switchport
Router(config-if)# switchport mode trunk
Router(config-if)# ethernet cfm mep level 7 outward domain CUSTOMER mpid 3001 vlan 100
```

The following example shows how to set interface Ethernet 5/0 as a domain boundary and define it as a MEP at level 7, with a MPID of 3001 on VLAN 100 on a routed port:

```
Router(config)# interface ethernet 5/0
Router(config-if)# ethernet cfm mep level 7 outward domain CUSTOMER mpid 3001 vlan 100

!
Router(config-if)# interface Ethernet5/0.100
Router(config-if)# encapsulation dot1q 100
```

#### Related Commands

Command	Description
<b>ethernet cfm domain</b>	Defines a CFM domain at a specified maintenance level.
<b>ethernet cfm mip level</b>	Provisions a MIP at a specified maintenance level on an interface.
<b>service vlan</b>	Sets a universally unique ID for a customer service instance within a maintenance domain.
<b>show ethernet cfm maintenance-points local</b>	Displays maintenance points configured on a device.

# ethernet cfm mip

To globally provision maintenance intermediate points (MIPs) at a specified maintenance level for VLAN IDs that are not associated with specific maintenance associations (MAs) and to enable level filtering, use the **ethernet cfm mip** command in global configuration mode. To remove a MIP, use the **no** form of this command.

```
ethernet cfm mip { auto-create level level-id vlan { vlan-id | vlan-id-vlan-id | ,vlan-id-vlan-id }
                    [lower-mep-only] [sender-id chassis] | filter }
```

```
no ethernet cfm mip { auto-create level level-id vlan { vlan-id | vlan-id-vlan-id | ,vlan-id-vlan-id }
                    [lower-mep-only] [sender-id chassis] | filter }
```

Syntax Description	
<b>auto-create</b>	Dynamically creates a connectivity fault management (CFM) MIP.
<b>level</b>	Specifies a maintenance domain level.
<i>level-id</i>	Integer from 0 to 7 that identifies the maintenance level.
<b>vlan</b>	Indicates a VLAN for configuration.
<i>vlan-id</i>	Integer from 1 to 4094 that identifies the VLAN to be configured.
<i>vlan-id-vlan-id</i>	Integers from 1 to 4094 that define a range of VLANs to be configured. <ul style="list-style-type: none"> <li>The hyphen is required to separate the starting and ending VLAN ID values that are used to define the range of VLAN IDs.</li> </ul>
, <i>vlan-id-vlan-id</i>	Integers from 1 to 4094 that define a range of VLANs to be configured. <ul style="list-style-type: none"> <li>The comma is required to separate VLAN ranges.</li> </ul>
<b>lower-mep-only</b>	(Optional) Creates a MIP only if a MEP is configured at the next lower active maintenance domain level for the VLAN ID on the port.
<b>sender-id</b>	(Optional) Configures the Sender ID option to send for VLAN IDs that are not associated with specific maintenance associations.  If the <b>sender-id</b> option is not configured, the Sender ID TLV is not included in messages.
<b>chassis</b>	(Optional) Sends the chassis ID.
<b>filter</b>	Configures a CFM MIP filter that drops all CFM frames at a lower level independent of whether they come from the wire or relay function side. <ul style="list-style-type: none"> <li>Level filtering is disabled by default.</li> </ul>

**Command Default** MIPs are not provisioned.

**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.

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**Usage Guidelines**

MIPs will be provisioned only if all the policies have been met.

This command has lower precedence than the manual MIP **ethernet cfm mip level** (interface configuration mode) configuration command. For example, if you manually configure a MIP for a particular MA, that configuration overrides the MIP created by the global **ethernet cfm mip** command for that MA.

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**Examples**

The following example shows how to dynamically create a MIP at maintenance level 6 and configure VLAN 500 if a MEP is configured at the next lower active maintenance domain level for the VLAN ID on the port:

```
Router(config)# ethernet cfm mip auto-create level 6 vlan 500 lower-mep-only
```

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**Related Commands**

Command	Description
<b>cfm mip level</b>	Sets a port as internal to a maintenance domain, and defines it as a MIP for a MA.
<b>ethernet cfm mip level</b>	Sets a port as internal to a maintenance domain, and defines it as a MIP.

# ethernet cfm mip level

To provision a maintenance intermediate point (MIP) at a specified maintenance level on an interface, use the **ethernet cfm mip level** command in interface configuration mode. To restore the default configuration of the interface, use the **no** form of this command.

## Cisco pre-Standard Connectivity Fault Management Draft 1 (CFM D1)

**ethernet cfm mip level** *level-id*

**no ethernet cfm mip level** *level-id*

## CFM IEEE 802.1ag Standard (CFM IEEE)

**ethernet cfm mip level** *level-id* [**vlan** {*vlan-id* | *vlan-id-vlan-id* | ,*vlan-id-vlan-id*}]

**no ethernet cfm mip level** *level-id* [**vlan** {*vlan-id* | *vlan-id-vlan-id* | ,*vlan-id-vlan-id*}]

### Syntax Description

<i>level-id</i>	Integer from 0 to 7 that specifies the maintenance levels at which MIPs can be defined.
<b>vlan</b>	(Optional) Indicates a VLAN for configuration.
<i>vlan-id</i>	(Optional) Integer from 1 to 4094 that identifies the VLAN to be configured.
<i>vlan-id-vlan-id</i>	(Optional) Integers from 1 to 4094 that define a valid range of VLANs to be configured. <ul style="list-style-type: none"> <li>The hyphen is required to separate the starting and ending VLAN ID values that are used to define the range of VLAN IDs.</li> </ul>
, <i>vlan-id-vlan-id</i>	(Optional) Integers from 1 to 4094 that define a valid range of VLANs to be configured. <ul style="list-style-type: none"> <li>The comma is required to separate VLAN ranges.</li> </ul>

### Command Default

No MIPs are configured.

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

**Usage Guidelines**

If you do not configure a VLAN, this command creates MIPs for all VLANs on an interface.

In the CFM D1 implementation, you must first configure a domain using the **ethernet cfm domain** command at the level you want to configure the MIP; otherwise, the **ethernet cfm mip level** command is rejected. In the CFM IEEE implementation, preconfiguring a domain is not required.

You cannot configure a MIP at a level lower than the level of already configured maintenance endpoints (MEPs) on an interface.

Configuring a MIP using this command is known as a manual MIP and has precedence over the **mip auto-create** command.

**Examples**

The following example shows how to provision a MIP at maintenance level 5 and then issue the **show ethernet cfm maintenance-points local** command to display the list of configured MIPs in the device:

```
Router(config-if)# ethernet cfm mip level 5
Router(config-if)# Ctrl-Z
Router# show ethernet cfm maintenance-points local
```

**Related Commands**

Command	Description
<b>ethernet cfm domain</b>	Defines a CFM domain.
<b>mip auto-create</b>	Enables the automatic creation of a MIP at a maintenance domain level.
<b>show ethernet cfm maintenance-points local</b>	Displays information about maintenance points configured on a device.

# ethernet cfm traceroute cache

To enable caching of Ethernet connectivity fault management (CFM) data learned through traceroute messages, use the **ethernet cfm traceroute cache** command in global configuration mode. To disable caching, use the **no** form of this command.

**ethernet cfm traceroute cache**

**no ethernet cfm traceroute cache**

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

**Command Default** Caching 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.
12.2(33)SX12	This command was integrated into Cisco IOS Release 12.2(33)SX12.

## Usage Guidelines

Setting a traceroute cache allows you to store the results of traceroute operations initiated on the device.

## Examples

The following example shows how to enable Ethernet CFM traceroute cache:

```
Router(config)# ethernet cfm traceroute cache
```

## Related Commands

<b>ethernet cfm traceroute cache hold-time</b>	Sets a maximum time that Ethernet CFM traceroute cache entries will be retained.
<b>ethernet cfm traceroute cache size</b>	Sets a maximum number for entries in an Ethernet CFM traceroute cache table.

# ethernet cfm traceroute cache hold-time

To set the time that Ethernet connectivity fault management (CFM) traceroute cache entries are retained, use the **ethernet cfm traceroute cache hold-time** command in global configuration mode. To remove the configured time, use the **no** form of this command.

**ethernet cfm traceroute cache hold-time** *minutes*

**no ethernet cfm traceroute cache hold-time**

## Syntax Description

<i>minutes</i>	Integer in the range of 1 to 65535 that specifies the number of minutes that cache entries will be retained. The default is 100.
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## Command Default

Entries are retained for 100 minutes.

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

## Usage Guidelines

Before you can issue this command, you must have enabled traceroute caching using the **ethernet cfm traceroute cache** command.

If traceroute cache is enabled and not empty and you change the hold time to less than the currently configured time, the change is rejected. You are prompted to clean up the table before the new hold time can be accepted. For example:

```
Router(config)# ethernet cfm traceroute cache hold-time 5
Please clean up the cache before setting smaller hold-time
current hold time = 100 Command Aborted.
Router(config)#
```

Output of the **show running all** command displays “ethernet cfm traceroute cache hold-time 100” when traceroute cache is enabled and the default value of 100 is configured.

## Examples

The following example shows how to set the retention time for entries in an Ethernet CFM traceroute cache table to 5 minutes:

```
Router(config)# ethernet cfm traceroute cache hold-time 5
```

**Related Commands**

<b>ethernet cfm traceroute cache</b>	Enables caching of Ethernet CFM data learned from traceroute messages.
<b>ethernet cfm traceroute cache size</b>	Sets a maximum number for entries in an Ethernet CFM traceroute cache table.
<b>show running all</b>	Shows the running configuration with default values.

# ethernet cfm traceroute cache size

To set a maximum size for the Ethernet connectivity fault management (CFM) traceroute cache table, use the **ethernet cfm traceroute cache size** command in global configuration mode. To remove the configured size, use the **no** form of this command.

**ethernet cfm traceroute cache size** *entries*

**no ethernet cfm traceroute cache size**

## Syntax Description

<i>entries</i>	Number of entries in the traceroute cache table, expressed as an integer in the range of 1 to 4095. The default is 100.
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## Command Default

If traceroute cache is enabled, traceroute replies are cached up to a maximum of 100 entries. If traceroute cache is disabled, traceroute replies are not cached; the default size is 0.

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

## Usage Guidelines

Before you can issue this command, you must have enabled traceroute caching using the **ethernet cfm traceroute cache** command.

Entries in the traceroute cache table are single replies from remote devices—not the number of operations on the device. In Cisco pre-Standard CFM Draft 1 when the maximum cache size is reached, new replies cannot be added until you clear the cache or increase its size. In CFM IEEE 802.1ag Standard when the maximum cache size is reached, the oldest traceroute operation is removed to make room for a new traceroute operation.

Output of the **show running all** command displays “ethernet cfm traceroute cache size 100” when traceroute cache is enabled and the default value of 100 is configured.

Setting the number of entries lower than the number of entries currently cached causes this command to be rejected, and you are prompted to clear the traceroute cache.

## Examples

The following example shows how to set the maximum number of entries in an Ethernet CFM traceroute cache table to 2500:

```
Router(config)# ethernet cfm traceroute cache size 2500
```

Related Commands	Command	Description
	<b>ethernet cfm traceroute cache</b>	Enables caching of Ethernet CFM data learned from traceroute messages.
	<b>ethernet cfm traceroute cache hold-time</b>	Sets the maximum time that Ethernet CFM traceroute cache entries will be retained.
	<b>show running all</b>	Shows the running configuration with default values.

# ethernet evc

To define an Ethernet virtual connection (EVC) and to enter EVC configuration mode, use the **ethernet evc** command in global configuration mode. To delete the EVC, use the **no** form of this command.

**ethernet evc** *evc-id*

**no ethernet evc** *evc-id*

## Syntax Description

*evc-id* String from 1 to 100 characters that identifies the EVC.

## Command Default

No EVCs are defined.

## Command Modes

Global configuration (config)

## Command History

Release	Modification
12.2(25)SEG	This command was introduced.
12.2(33)SRB	This command was integrated into Cisco IOS Release 12.2(33)SRB.
12.4(15)T	This command was integrated into Cisco IOS Release 12.4(15)T.

## Usage Guidelines

After you enter the **ethernet evc** command, the device enters EVC configuration mode and the following configuration commands are available:

- **default**—Sets the EVC to its default states.
- **exit**—Exits EVC configuration mode and returns the CLI to global configuration mode.
- **no**—Negates a command or returns a command to its default setting.
- **oam protocol**—Configures the Ethernet operations, administration, and maintenance (OAM) protocol and sets parameters.
- **uni count**—Configures a UNI count for the EVC.

## Examples

The following example shows how to define an EVC named test1 and to enter EVC configuration mode:

```
Router(config)# ethernet evc test1
Router(config-enc)#
```

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<b>oam protocol</b>	Configures the EVC OAM protocol.
	<b>service instance</b>	Configures an Ethernet service instance and attaches an EVC to it.
	<b>show ethernet service evc</b>	Displays information about configured EVCs.
	<b>uni count</b>	Sets the UNI count for an EVC.

# ethernet lmi

To set Ethernet local management interface (LMI) parameters for a user-network interface (UNI), use the **ethernet lmi** command in interface configuration mode. To remove Ethernet LMI parameters on a UNI, use the **no** form of this command.

```
ethernet lmi {n391 | n393 | t391 | t392} value
```

```
no ethernet lmi {n391 | n393 | t391 | t392}
```

## Syntax Description

<b>n391</b>	Polling counter on the customer equipment. A polling counter polls the status of the UNI and all Ethernet virtual connections (EVCs).
<b>n393</b>	An error counter for customer equipment or for a metro Ethernet network.
<b>t391</b>	Polling timer on the customer equipment. A polling timer transmits status enquiries and when status messages are not received, records errors.
<b>t392</b>	Polling verification timer on the metro Ethernet network. The polling verification timer verifies status enquiries received. When a timer expires, an error is recorded and the timer is restarted.  <b>Note</b> The t392 timer is valid only on Ethernet LMI provider edge (PE) devices. It is not available on customer edge (CE) devices.
<i>value</i>	Integer value within ranges that vary depending on the keyword with which it is used. Valid values are as follows: <ul style="list-style-type: none"> <li><b>n391</b>—1 to 65000. Default is 360.</li> <li><b>n393</b>—1 to 10. Default is 4.</li> <li><b>t391</b>—5 to 30 (seconds). Default is 10.</li> <li><b>t392</b>—5 to 30 (seconds); default is 15 or 0 to 0 (0–0), which disables the timer.</li> </ul>

## Command Default

Ethernet LMI parameters are not set on any UNIs.

## Command Modes

Interface configuration (config-if)

## 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

The value for the polling verification timer (t392) should be greater than the value for the polling timer (t391).

The polling verification timer (t392) can be disabled.

A very high value for the polling timer (t391) means more time spent detecting Ethernet LMI link-down errors.

---

**Examples**

The following example shows how to set a polling counter for 30 seconds on interface Ethernet 1/0:

```
Router# configure terminal  
Router(config)# interface ethernet 1/0  
Router(config-if)# ethernet lmi t391 30
```

# ethernet lmi ce-vlan map

To configure Ethernet Local Management Interface (LMI) parameters, use the **ethernet lmi ce-vlan map** command in Ethernet service configuration mode. To remove the configuration, use the **no** form of this command.

```
ethernet lmi ce-vlan map {vlan-id [untagged] | any | default | untagged}
```

```
no ethernet lmi ce-vlan map {vlan-id | any | default | untagged}
```

## Syntax Description

<i>vlan-id</i>	Integer in the range of 1 to 4094 that identifies the customer VLAN or VLANs to map to. <ul style="list-style-type: none"> <li>You can enter a range of VLAN IDs using a hyphen (-) between IDs or enter a series of VLAN IDs using a comma (,) to separate each one.</li> </ul>
<b>untagged</b>	Map untagged VLANs.  (Optional) When used with a range or series of VLANs, the <b>untagged</b> keyword is optional.
<b>any</b>	Map all VLANs (untagged and VLANs 1 to 4094).
<b>default</b>	Map to the default service instance. <ul style="list-style-type: none"> <li>You can use the <b>default</b> keyword only if you have already mapped the service instance to a VLAN or a group of VLANs.</li> </ul>

## Command Default

No Ethernet LMI mapping parameters are defined.

## Command Modes

Ethernet service configuration (config-if-srv)

## Command History

Release	Modification
12.2(25)SEG	This command was introduced.
12.2(33)SRB	This command was implemented on the Cisco 7600 series routers.
12.4(15)T	This command was integrated into Cisco IOS Release 12.4(15)T.

## Usage Guidelines

If you intend to use the **ethernet lmi ce-vlan map any** command, you must first configure all-to-one bundling on the interface.

Use this command to configure an Ethernet LMI customer VLAN-to-EVC map for a particular user-network interface (UNI).

Ethernet LMI mapping parameters are related to the bundling characteristics set by entering the **ethernet uni** command in interface configuration mode.

- Using the default UNI attribute (bundling and multiplexing) supports multiple EVCs and multiple VLANs.
- Entering the **ethernet uni bundle** command supports only one EVC with one or more VLANs.

- Entering the **ethernet uni bundle all-to-one** command supports multiple VLANs but only one EVC. If you use the **ethernet lmi ce-vlan map any** command in Ethernet service configuration mode, you must first configure all-to-one bundling on the interface.
- Entering the **ethernet uni multiplex** command supports multiple EVCs with only one VLAN per EVC.

---

**Examples**

The following example shows how to configure an Ethernet LMI customer VLAN-to-EVC map to test customer VLAN 101 in service instance 333 on the interface:

```
Router(config)# interface ethernet 2/1
Router(config-if)# service instance 333 ethernet test
Router(config-if-srv)# ethernet lmi ce-vlan map 101
```

---

**Related Commands**

Command	Description
<b>service instance ethernet</b>	Defines an Ethernet service instance and enters Ethernet service configuration mode.
<b>show ethernet service instance</b>	Displays information about configured Ethernet service instances.

# ethernet lmi global

To enable Ethernet local management interface (LMI) functionality globally on a device, use the **ethernet lmi global** command in global configuration mode. To disable Ethernet LMI globally on a device, use the **no** form of this command.

**ethernet lmi global**

**no ethernet lmi global**

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

**Command Default** Ethernet LMI is disabled.

**Command Modes** Global configuration (config)

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** Ethernet LMI is disabled by default on an interface and must be explicitly enabled. The **ethernet lmi global** command enables Ethernet LMI on all interfaces for an entire device. The benefit of this command is that you can enable Ethernet LMI on all interfaces with one command compared to enabling Ethernet LMI separately on each interface.

To disable Ethernet LMI on a specific interface after the **ethernet lmi global** command has been issued, the **no ethernet lmi interface** command must be issued on that interface.

The sequence in which the **ethernet lmi interface** and **ethernet lmi global** commands are issued is significant. The latest command issued overrides the prior command issued.

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

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

Related Commands	Command	Description
	<b>ethernet lmi interface</b>	Enables Ethernet LMI for a user-network interface.

# ethernet lmi interface

To enable Ethernet local management interface (LMI) on a user-network interface (UNI), use the **ethernet lmi interface** command in interface configuration mode. To remove Ethernet LMI on a UNI, use the **no** form of this command.

**ethernet lmi interface**

**no ethernet lmi interface**

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

**Command Default** Ethernet LMI parameters are not set on any UNIs.

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

## 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 enables Ethernet LMI processing on an interface if the **ethernet lmi global** command has not been issued. When the **ethernet lmi global** command has been issued, Ethernet LMI is enabled on all interfaces. In this case, the **no ethernet lmi interface** command overrides the **ethernet lmi global** command and disables Ethernet LMI processing on the interface.

The sequence in which the commands are issued is significant. The latest command issued overrides the prior command issued.

## Examples

The following example shows how to enable Ethernet LMI on interface Ethernet 1/0:

```
Router# configure terminal
Router(config)# interface ethernet 1/0
Router(config-if)# ethernet lmi interface
```

## Related Commands

Command	Description
<b>ethernet lmi global</b>	Enables Ethernet LMI functionality globally on a device.

# ethernet mac-flush notification mirp

To send Multiple Service Instance ID (I-SID) Registration Protocol (MIRP) messages to the remote end when the standby Point of Attachment (PoA) becomes active and to specify that MIRP messages should be processed when they are received, use the **ethernet mac-flush notification mirp** command in global configuration mode. To disable the notifications and processing, use the **no** form of this command.

```
ethernet mac-flush notification mirp [cos value]
```

```
[no] ethernet mac-flush notification mirp [cos value]
```

<b>Syntax Description</b>	<b>cos value</b>	Specify the class-of-service (CoS) bit in the MIRP messages to be sent per system. The <i>value</i> can be a number from 1 to 7. The default is 7.
---------------------------	------------------	--

<b>Command Default</b>	This command is enabled by default, and the CoS bit in the MIRP messages is 7.
------------------------	--

<b>Command Modes</b>	Global config (config#)
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<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.2(33)SRE	This command was introduced.

<b>Usage Guidelines</b>	When the <b>ethernet mac-flush notification mirp</b> command is configured, you can enter the <b>no mac-flush notification mirp</b> command in the service instance configuration mode. However, when the <b>no ethernet mac-flush notification mirp</b> command is configured, enabling MIRP for an individual service instance by configuring <b>mac-flush notification mirp</b> in service instance configuration mode is not allowed.
-------------------------	---

The service instance configuration mode commands are automatically generated as a result of the global commands. Therefore, you can not enable MIRP for service instances when the global **no mac-flush notification mirp** command is configured.

<b>Examples</b>	The following example shows how to configure class-of-service bit 5 for MAC-flush notification for an Ethernet service instance:
-----------------	--

```
ethernet mac-tunnel virtual 1
  bridge domain 100
  service instance 1 ethernet
    encapsulation dot1ah isid 10000
    mac-flush notification mirp cos 5
```

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<b>service instance</b>	Configures an Ethernet service instance.

# ethernet mac-tunnel virtual

To configure a virtual MAC-in-MAC tunnel and place the command-line interface (CLI) into MAC-in-MAC tunnel configuration mode, use the **ethernet mac-tunnel virtual** command in global configuration mode. To remove the configured virtual MAC-in-MAC tunnel, use the **no** form of this command.

**ethernet mac-tunnel virtual** *tunnel-id*

**no ethernet mac-tunnel virtual** *tunnel-id*

## Syntax Description

<i>tunnel-id</i>	Integer from 1 to 2147483647 that identifies the MAC-in-MAC tunnel.
	<ul style="list-style-type: none"> <li>The upper limit may vary based on the platform.</li> </ul>

## Command Default

No virtual MAC-in-MAC tunnels are configured.

## Command Modes

Global configuration (config)

## Command History

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

## Usage Guidelines

Multiple MAC tunnels with the same identifier cannot coexist on a single bridge.  
In Cisco IOS Release 12.2(33)SRE, the platform upper limit for tunnel IDs is 4094.

## Examples

The following example shows how to configure a virtual MAC-in-MAC tunnel and enter MAC-in-MAC tunnel configuration mode:

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

# ethernet oam

To enable Ethernet operations, maintenance, and administration (OAM) on an interface, use the **ethernet oam** command in interface configuration mode. To disable Ethernet OAM on an interface, use the **no** form of this command.

```
ethernet oam [max-rate oampdus | min-rate num-seconds | mode {active | passive} | timeout
seconds]
```

```
no ethernet oam [max-rate | min-rate | mode {active | passive} | timeout]
```

Syntax Description		
<b>max-rate</b>	(Optional) Sets the maximum rate that OAM protocol data units (PDUs) can be sent per second.	
<i>oampdus</i>	(Optional) Integer in the range of 1 to 10 that is the number of OAM PDUs transmitted. The default is 10 for the maximum rate.	
<b>min-rate</b>	(Optional) Controls the minimum rate that OAM PDUs are transmitted, in seconds.	
<i>num-seconds</i>	(Optional) Integer in the range of 1 to 10 that is the number of seconds during which at least one OAM PDU must be sent.	
<b>mode</b>	(Optional) Sets the OAM client mode.	
<b>active</b>	(Optional) Sets the OAM client mode to active after the interface was previously placed in passive mode. Active is the default.	
<b>passive</b>	(Optional) Sets the OAM client mode to passive. In passive mode, a device cannot initiate discovery, inquire about variables, or set loopback mode.	
<b>timeout</b>	(Optional) Specifies the amount of time, in seconds, after which a device declares its OAM peer to be nonoperational and resets its state machine.	
<i>seconds</i>	(Optional) Integer in the range of 2 to 30 that is the number of seconds of the timeout period. The default is 5.	

**Command Default** Ethernet OAM is disabled.

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

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** When Ethernet OAM is configured on an interface, the default mode of the OAM client is active. When the Ethernet OAM mode is enabled on two interfaces passing traffic, both interfaces cannot be in passive mode. Both interfaces can be in active mode, and one can be in active mode and the other in passive mode. You can toggle between Ethernet OAM modes without disabling OAM.

The **min-rate** *num-seconds* keyword and argument pair controls the minimum rate at which OAM PDUs can be sent on an interface, in seconds. A value of *n*, where 1 is less than or equal to *n* and *n* is less than or equal to 10, indicates that an OAM PDU must be sent at least once per *n* seconds. If no other OAM PDU is to be sent within an *n*-second window, an information OAM PDU must be sent.

---

**Examples**

The following example shows how to activate an Ethernet OAM interface that was previously configured to be in passive mode:

```
Router(config)# interface gigabitethernet 0/1  
Router(config-if)# ethernet oam mode active
```

The following example shows how to set the maximum transmission rate of OAM PDUs on interface GigabitEthernet 0/1 to 5 transmissions per second:

```
Router(config)# interface gigabitethernet 0/1  
Router(config-if)# ethernet oam max-rate 5
```

The following example shows how to set the timeout period to 25 seconds on interface GigabitEthernet 0/1:

```
Router(config)# interface gigabitethernet 0/1  
Router(config-if)# ethernet oam timeout 25
```

# ethernet oam link-monitor frame

To configure an error frame threshold or window on an Ethernet operations, maintenance, and administration (OAM) interface, use the **ethernet oam link-monitor frame** command in configuration template mode or interface configuration mode. To remove the threshold or window, use the **no** form of this command.

```
ethernet oam link-monitor frame { threshold { high { none | high-frames } | low low-frames } |
window milliseconds }
```

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

## Syntax Description

<b>threshold</b>	Sets a number of error frames at, above, or below which an action is triggered.
<b>high</b>	Sets a high error frame threshold in number of frames.
<b>none</b>	Disables a high threshold.
<i>high-frames</i>	Integer in the range of 1 to 65535 that is the high threshold in number of frames.
<b>low</b>	Sets a low error frame threshold.
<i>low-frames</i>	Integer in the range of 0 to 65535 that sets the low threshold in number of frames. The default is 1.
<b>window</b>	Sets a window and period of time during which error frames are counted.
<i>milliseconds</i>	Integer in the range of 10 to 600 that represents a number of milliseconds in a multiple of 100. The default is 100.

## Command Default

The **ethernet oam link-monitor frame** command is not configured.

## Command Modes

Configuration template (config-template)  
Interface configuration (config-if)

## 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

The **ethernet oam link-monitor frame** command configures a number of error frames that triggers an action or a period of time in which error frames are counted.

**Examples**

The following example shows how to configure an Ethernet OAM link-monitor frame window of 3000 milliseconds:

```
Router(config-template)# ethernet oam link-monitor frame window 300
```

**Related Commands**

<b>ethernet oam link-monitor frame-period</b>	Configures an error frame period on an Ethernet OAM interface.
<b>ethernet oam link-monitor frame-seconds</b>	Configures a frame-seconds period on an Ethernet OAM interface.
<b>ethernet oam link-monitor high-threshold action</b>	Configures a specific action to occur when a high threshold for an error is exceeded on an Ethernet OAM interface.
<b>ethernet oam link-monitor receive-crc</b>	Configures an Ethernet OAM interface to monitor frames received with CRC errors for a period of time.
<b>ethernet oam link-monitor symbol-period</b>	Configures an error symbol period on an Ethernet OAM interface.
<b>ethernet oam link-monitor transmit-crc</b>	Configures an Ethernet OAM interface to monitor frames transmitted with CRC errors for a period of time.

# ethernet oam link-monitor frame-period

To configure an error frame period on an Ethernet operations, maintenance, and administration (OAM) interface, use the **ethernet oam link-monitor frame-period** command in configuration template or interface configuration mode. To remove the frame period, use the **no** form of this command.

```
ethernet oam link-monitor frame-period { threshold { high { none | high-frames } | low
low-frames } | window frames }
```

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

## Syntax Description

<b>threshold</b>	Sets a number of error frames for the period at, above, or below which an action is triggered.
<b>high</b>	Sets a high threshold for the error frame period in number of frames.
<b>none</b>	Disables a high threshold.
<i>high-frames</i>	Integer in the range of 1 to 65535 that is the high threshold in number of frames. There is no default. The high threshold must be configured.
<b>low</b>	Sets a low threshold for the error frame period in number of frames.
<i>low-frames</i>	Integer in the range of 0 to 65535 that is the low threshold in number of frames. The default is 1.
<b>window</b>	Sets a polling window and window size.
<i>frames</i>	Integer in the range of 1 to 65535 that is the window size in number of frames. Each value is a multiple of 10000. The default is 1000.

## Command Default

The **ethernet oam link-monitor frame-period** command is not configured.

## Command Modes

Configuration template (config-template)  
Interface configuration (config-if)

## 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

The **ethernet oam link-monitor frame-period** command configures an error frame period in number of frames. When a high threshold is configured, it must be at least as great as the low threshold for frame errors.

The number of frames polled is user defined. Note that the system can poll only by time, not by frames. The number of frames you specify is converted internally to seconds using a formula that includes interface speed.

**Examples**

The following example shows how to configure an Ethernet OAM link-monitor frame-period window of 20000 frames:

```
Router(config-template)# ethernet oam link-monitor frame-period window 2
```

The following example shows how to configure an Ethernet OAM link-monitor frame-period low threshold of 500 frames:

```
Router(config-template)# ethernet oam link-monitor frame-period threshold low 500
```

**Related Commands**

<b>ethernet oam link-monitor frame</b>	Configures an error frame threshold or window on an Ethernet OAM interface.
<b>ethernet oam link-monitor frame-seconds</b>	Configures a frame-seconds period on an Ethernet OAM interface.
<b>ethernet oam link-monitor high-threshold action</b>	Configures a specific action to occur when a high threshold for an error is exceeded on an Ethernet OAM interface.
<b>ethernet oam link-monitor receive-crc</b>	Configures an Ethernet OAM interface to monitor frames received with CRC errors for a period of time.
<b>ethernet oam link-monitor symbol-period</b>	Configures an error symbol period on an Ethernet OAM interface.
<b>ethernet oam link-monitor transmit-crc</b>	Configures an Ethernet OAM interface to monitor frames transmitted with CRC errors for a period of time.

# ethernet oam link-monitor frame-seconds

To configure a frame-seconds period on an Ethernet operations, maintenance, and administration (OAM) interface, use the **ethernet oam link-monitor frame-seconds** command in configuration template and interface configuration mode. To remove the threshold or window, use the **no** form of this command.

```
ethernet oam link-monitor frame-seconds { threshold { high { none | high-frames } | low
low-frames } | window milliseconds }
```

```
no ethernet oam link-monitor frame-seconds { threshold { high | low } | window }
```

## Syntax Description

<b>threshold</b>	Sets a number at, above, or below which an action is triggered.
<b>high</b>	Sets a high error frame-seconds threshold in number of seconds.
<b>none</b>	Disables a high threshold.
<i>high-frames</i>	Integer in the range of 1 to 900 that is the high threshold in number of frames. There is no default. The high threshold must be configured.
<b>low</b>	Sets a low error frame-seconds threshold in number of seconds.
<i>low-frames</i>	Integer in the range of 1 to 900 that sets the low threshold in number of frames. The default is 1.
<b>window</b>	Sets a polling window during which error frames are counted.
<i>milliseconds</i>	Integer in the range of 100 to 9000 that represents a number of milliseconds in a multiple of 100. The default is 1000.

## Command Default

The **ethernet oam link-monitor frame-seconds** command is not configured.

## Command Modes

Configuration template (config-template)  
Interface configuration (config-if)

## 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

The **ethernet oam link-monitor frame-seconds** command configures a number of error frames that triggers an action or a period of time in which error frames are counted.

## Examples

The following example shows how to configure an Ethernet OAM link-monitor frame-seconds window of 30000 milliseconds (30 seconds):

```
Router(config-template)# ethernet oam link-monitor frame-seconds window 300
```

**Related Commands**

<b>ethernet oam link-monitor frame</b>	Configures an error frame threshold or window on an Ethernet OAM interface.
<b>ethernet oam link-monitor frame-period</b>	Configures an error frame period on an Ethernet OAM interface.
<b>ethernet oam link-monitor high-threshold action</b>	Configures a specific action to occur when a high threshold for an error is exceeded on an Ethernet OAM interface.
<b>ethernet oam link-monitor receive-crc</b>	Configures an Ethernet OAM interface to monitor frames received with CRC errors for a period of time.
<b>ethernet oam link-monitor symbol-period</b>	Configures an error symbol period on an Ethernet OAM interface.
<b>ethernet oam link-monitor transmit-crc</b>	Configures an Ethernet OAM interface to monitor frames transmitted with CRC errors for a period of time.

# ethernet oam link-monitor high-threshold action

To configure a specific action to occur when a high threshold for an error is exceeded on an Ethernet operations, maintenance, and administration (OAM) interface, use the **ethernet oam link-monitor high-threshold action** command in configuration template mode. To remove the high-threshold action, use the **no** form of this command.

```
ethernet oam link-monitor high-threshold action {error-disable-interface | failover}
```

```
no ethernet oam link-monitor high-threshold action
```

## Syntax Description

<b>error-disable-interface</b>	Performs an error-disable function on the interface.
<b>failover</b>	Performs a failover to another port in the same PortChannel.

## Command Default

A high-threshold action is not configured.

## Command Modes

Configuration template (config-template)

## 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

The failover action is applicable only to EtherChannel interfaces. It provides an automatic failover of traffic from one port in an EtherChannel to another port in the same EtherChannel when one of the ports in the channel exceeds the high threshold for an error within the specified interval. The port failover occurs only if at least one operational port is in the EtherChannel. The failed port is put into an error-disable state. If the failed port is the last port in the EtherChannel, the port will not be put into the error-disable state and will continue to pass traffic regardless of the types of errors received.

Single, nonchanneling ports go into the error-disable state when the error high threshold is exceeded within the specified interval.

## Examples

The following example shows how to configure an error-disable-interface action to occur when the high threshold for an error is exceeded:

```
Router(config-template)# ethernet oam link-monitor high-threshold action
error-disable-interface
```

**Related Commands**

<b>ethernet oam link-monitor frame</b>	Configures an error frame threshold or window on an Ethernet OAM interface.
<b>ethernet oam link-monitor frame-period</b>	Configures an error frame period on an Ethernet OAM interface.
<b>ethernet oam link-monitor frame-seconds</b>	Configures a frame-seconds period on an Ethernet OAM interface.
<b>ethernet oam link-monitor receive-crc</b>	Configures an Ethernet OAM interface to monitor frames received with CRC errors for a period of time.
<b>ethernet oam link-monitor symbol-period</b>	Configures an error symbol period on an Ethernet OAM interface.
<b>ethernet oam link-monitor transmit-crc</b>	Configures an Ethernet OAM interface to monitor frames transmitted with CRC errors for a period of time.

# ethernet oam link-monitor on

To enable link monitoring on an Ethernet operations, maintenance, and administration (OAM) interface, use the **ethernet oam link-monitor on** command in interface configuration mode. To disable link monitoring, use the **no** form of this command.

**ethernet oam link-monitor on**

**no ethernet oam link-monitor on**

## Syntax Description

This command has no arguments or keywords.

## Command Default

Link monitoring is turned on when Ethernet OAM is enabled.

## Command Modes

Interface configuration (config-if)

## 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

When link monitoring is enabled, the interface sends event OAM protocol data units (PDUs) when errors occur and interprets event OAM PDUs from the remote peer. Link monitoring can be effective only if both the local client and remote peer agree to support it.

The **ethernet oam link-monitor on** command is enabled by default when Ethernet OAM is enabled and does not display in the configuration when the **show running-config** command is issued.

When link monitoring is enabled by default, to turn it off you must explicitly disable it by issuing the **no** form of this command.

## Examples

The following example shows how to disable link monitoring on Ethernet OAM interface Ethernet 0/1:

```
Router(config)# interface ethernet 0/1
Router(config-if)# no ethernet oam link-monitor on
```

## Related Commands

**ethernet oam link-monitor supported** Enables support for link monitoring on an Ethernet OAM interface.

# ethernet oam link-monitor receive-crc

To configure an Ethernet operations, maintenance, and administration (OAM) interface to monitor ingress frames received with cyclic redundancy code (CRC) errors for a period of time, use the **ethernet oam link-monitor receive-crc** command in configuration template or interface configuration mode. To disable monitoring, use the **no** form of this command.

```
ethernet oam link-monitor receive-crc { threshold { high { high-frames | none } | low low-frames }
| window milliseconds }
```

```
no ethernet oam link-monitor receive-crc { threshold { high | low } | window }
```

## Syntax Description

<b>threshold</b>	Sets a number of frames with CRC errors received at, above, or below which an action is triggered.
<b>high</b>	Sets a high threshold in number of frames.
<i>high-frames</i>	Integer in the range of 1 to 65535 that is the high threshold in number of frames.
<b>none</b>	Disables a high threshold.
<b>low</b>	Sets a low threshold.
<i>low-frames</i>	Integer in the range of 0 to 65535 that sets the low threshold in number of frames. The default is 10.
<b>window</b>	Sets a window and period of time during which frames with CRC errors are counted.
<i>milliseconds</i>	Integer in the range of 10 to 1800 that represents a number of milliseconds in a multiple of 100. The default is 1000.

## Command Default

The **ethernet oam link-monitor receive-crc** command is not configured.

## Command Modes

Configuration template (config-template)  
Interface configuration (config-if)

## 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

OAM must be operational on the interface before you issue this command.

**Examples**

The following example shows how to configure a receive-crc period with a low threshold of 3000:

```
Router(config-if)# ethernet oam link-monitor receive-crc threshold low 3000
```

**Related Commands**

<b>ethernet oam link-monitor frame</b>	Configures an error frame threshold or window on an Ethernet OAM interface.
<b>ethernet oam link-monitor frame-period</b>	Configures an error frame period on an Ethernet OAM interface.
<b>ethernet oam link-monitor frame-seconds</b>	Configures a frame-seconds period on an Ethernet OAM interface.
<b>ethernet oam link-monitor high-threshold action</b>	Configures a specific action to occur when a high threshold for an error is exceeded on an Ethernet OAM interface.
<b>ethernet oam link-monitor symbol-period</b>	Configures an error symbol period on an Ethernet OAM interface.
<b>ethernet oam link-monitor transmit-crc</b>	Configures an Ethernet OAM interface to monitor frames transmitted with CRC errors for a period of time.

# ethernet oam link-monitor supported

To enable support for link monitoring on an Ethernet operations, maintenance, and administration (OAM) interface, use the **ethernet oam link-monitor supported** command in interface configuration mode. To disable link monitoring support, use the **no** form of this command.

**ethernet oam link-monitor supported**

**no ethernet oam link-monitor supported**

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

**Command Default** Link monitoring is supported when Ethernet OAM is enabled.

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

## 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 to help establish an OAM session for performing OAM functions, such as remote loopback. For example, if your device is connected to a third-party device that does not support link monitoring, you must disable link monitoring support on your device to establish an OAM session with the third-party device.

When the **ethernet oam link-monitor supported** command has been issued, remote loopback will not function, whether or not an interface has been configured to support it.

The **ethernet oam link-monitor supported** command is enabled by default when Ethernet OAM is enabled and does not display in the configuration when the **show running-config** command is issued.

When support for link monitoring is enabled by default, to turn it off you must explicitly disable it by issuing the **no** form of this command.

## Examples

The following example shows how to disable support for link monitoring on the GigabitEthernet 0/1 OAM interface:

```
Router(config)# interface gigabitethernet 0/1
Router(config-if)# no ethernet oam link-monitor supported
```

The following example shows how to reenable support for link monitoring on the GigabitEthernet 0/1 OAM interface after support has been disabled:

```
Router(config)# interface gigabitethernet 0/1
Router(config-if)# ethernet oam link-monitor supported
```

---

**Related Commands**

---

<b>ethernet oam link-monitor on</b>	Enables link monitoring on an Ethernet OAM interface.
-------------------------------------	---

---

# ethernet oam link-monitor symbol-period

To configure an error symbol period on an Ethernet operations, maintenance, and administration (OAM) interface, use the **ethernet oam link-monitor symbol-period** command in configuration template or interface configuration mode. To remove the symbol period, use the **no** form of this command.

**ethernet oam link-monitor symbol-period** { **threshold** { **high** { **none** | *high-symbols* } | **low** *low-symbols* } | **window** *symbols* }

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

Syntax Description		
<b>threshold</b>		Sets a number of error symbols at, above, or below which an action is triggered.
<b>high</b>		Sets a high threshold for the period in number of error symbols.
<b>none</b>		Disables a high threshold.
<i>high-symbols</i>		Integer in the range of 1 to 65535 that is the high threshold in number of symbols. There is no default. The high threshold must be configured.
<b>low</b>		Sets a low threshold for the period in number of error symbols.
<i>low-symbols</i>		Integer in the range of 0 to 65535 that is the low threshold in number of symbols.
<b>window</b>		Sets a window and window size.
<i>symbols</i>		Integer in the range of 1 to 65535 that is the window size in number of symbols. Each value represents one million.

**Command Default** The **ethernet oam link-monitor symbol-period** command is not configured.

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

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** The **ethernet oam link-monitor symbol-period** command configures an error symbol threshold or error symbol window in number of symbols. When a high threshold is configured, it must be at least as great as the low threshold for symbol errors.

This command can be applied to an Ethernet OAM template and to an interface. The value configured on an interface takes precedence over the value configured by this command for the template.

This command is prefixed with “ether oam” in interface configuration mode.

**Examples**

The following example shows how to configure a symbol-period window of 500 million error symbols:

```
Router(config-template)# ethernet oam link-monitor symbol-period window 500
```

The following example shows how to configure a symbol-period low threshold of 500 error symbols:

```
Router(config-template)# ethernet oam link-monitor symbol-period threshold low 500
```

**Related Commands**

<b>ethernet oam link-monitor frame</b>	Configures an error frame threshold or window on an Ethernet OAM interface.
<b>ethernet oam link-monitor frame-period</b>	Configures an error frame period on an Ethernet OAM interface.
<b>ethernet oam link-monitor frame-seconds</b>	Configures a frame-seconds period on an Ethernet OAM interface.
<b>ethernet oam link-monitor high-threshold action</b>	Configures a specific action to occur when a high threshold for an error is exceeded on an Ethernet OAM interface.
<b>ethernet oam link-monitor receive-crc</b>	Configures an Ethernet OAM interface to monitor frames received with CRC errors for a period of time.
<b>ethernet oam link-monitor transmit-crc</b>	Configures an Ethernet OAM interface to monitor frames transmitted with CRC errors for a period of time.

# ethernet oam link-monitor transmit-crc

To configure an Ethernet operations, maintenance, and administration (OAM) interface to monitor egress frames transmitted with cyclic redundancy code (CRC) errors for a period of time, use the **ethernet oam link-monitor transmit-crc** command in configuration template or interface configuration mode. To disable monitoring, use the **no** form of this command.

```
ethernet oam link-monitor transmit-crc { threshold { high { high-frames | none } | low
low-frames } | window milliseconds }
```

```
no ethernet oam link-monitor transmit-crc { threshold { high | low } | window }
```

## Syntax Description

<b>threshold</b>	Sets a number of frames with CRC errors transmitted at, above, or below which an action is triggered.
<b>high</b>	Sets a high threshold in number of frames.
<i>high-frames</i>	Integer in the range of 1 to 65535 that is the high threshold in number of frames.
<b>none</b>	Disables a high threshold.
<b>low</b>	Sets a low threshold.
<i>low-frames</i>	Integer in the range of 0 to 65535 that sets the low threshold in number of frames. The default is 10.
<b>window</b>	Sets a window and period of time during which frames with transmit CRC errors are counted.
<i>milliseconds</i>	Integer in the range of 10 to 1800 that represents a number of milliseconds in a multiple of 100. The default is 100.

## Command Default

The **ethernet oam link-monitor transmit-crc** command is not configured.

## Command Modes

Configuration template (config-template)  
Interface configuration (config-if)

## 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

OAM must be operational on the interface before you issue this command.

**Examples**

The following example shows how to configure a transmit CRC window of 2500 milliseconds:

```
Router(config-if)# ethernet oam link-monitor transmit-crc window 25
```

**Related Commands**

<b>ethernet oam link-monitor frame</b>	Configures an error frame threshold or window on an Ethernet OAM interface.
<b>ethernet oam link-monitor frame-period</b>	Configures an error frame period on an Ethernet OAM interface.
<b>ethernet oam link-monitor frame-seconds</b>	Configures a frame-seconds period on an Ethernet OAM interface.
<b>ethernet oam link-monitor high-threshold action</b>	Configures a specific action to occur when a high threshold for an error is exceeded on an Ethernet OAM interface.
<b>ethernet oam link-monitor receive-crc</b>	Configures an Ethernet OAM interface to monitor frames received with CRC errors for a period of time.
<b>ethernet oam link-monitor symbol-period</b>	Configures an error symbol period on an Ethernet OAM interface.

# ethernet oam mib log size

To set the size of the Ethernet Operations, Administration, and Maintenance (OAM) event log table, use the **ethernet oam mib log size** command in global configuration mode. To remove the event log table, use the **no** form of this command.

**ethernet oam mib log size** *entries*

**no ethernet oam mib log size**

<b>Syntax Description</b>	<i>entries</i>	Number of entries that the event log table will hold. Integer from 0 to 200. The minimum is 0, the maximum is 200, and the default is 50.
---------------------------	----------------	---

<b>Command Default</b>	An event log table is not configured.
------------------------	---------------------------------------

<b>Command Modes</b>	Global configuration (config)
----------------------	-------------------------------

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

<b>Usage Guidelines</b>	Use this command to configure an OAM event log table.
-------------------------	---

<b>Examples</b>	The following example shows how to set the size of an event log table to 100 entries:
-----------------	---

```
Router# configure terminal
Router(config)# ethernet oam mib log size 100
```

# ethernet oam remote-loopback

To turn on or off Ethernet operations, maintenance, and administration (OAM) remote loopback functionality on an interface, use the **ethernet oam remote-loopback** command in privileged EXEC mode. This command does not have a **no** form.

```
ethernet oam remote-loopback {start | stop} {interface type number}
```

## Syntax Description

<b>start</b>	Starts the remote loopback operation.
<b>stop</b>	Stops the remote loopback operation.
<b>interface</b>	Specifies an interface.
<i>type</i>	Type of Ethernet interface. Valid values are: FastEthernet, GigabitEthernet, TenGigabitEthernet.
<i>number</i>	Integer from 1 to 9 that is the number of the Ethernet interface.

## Command Default

Remote loopback functionality is turned off.

## 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

A **no** form of this command is not available.

When Ethernet OAM remote loopback functionality is enabled on an interface, traffic sent out on this interface will be discarded or sent back (and dropped locally) by the remote interface.

Remote loopback will not function, whether or not an interface has been configured to support it, when the **no ethernet oam link-monitor supported** command has been issued.



**Note** To start Ethernet OAM remote loopback on a switch port, you must first configure the **access-group mode prefer port** command in interface configuration mode.

## Examples

The following example shows how to start a remote loopback session on interface GigabitEthernet 2/1:

```
Router# ethernet oam remote-loopback start interface gigabitethernet2/1
```

**Related Commands**

---

<b>access-group mode prefer port</b>	Specifies the override modes and the nonoverride modes for an access group and specifies that the ACL mode takes precedence if ACLs are configured.
<b>ethernet oam remote-loopback (interface)</b>	Enables the support of Ethernet OAM remote loopback operation on an interface or sets a remote loopback timeout period.

---

# ethernet oam remote-loopback (interface)

To enable the support of Ethernet operations, maintenance, and administration (OAM) remote loopback operations on an interface or set a remote loopback timeout period, use the **ethernet oam remote-loopback (interface)** command in interface configuration mode. To disable support or remove the timeout setting, use the **no** form of this command.

**ethernet oam remote-loopback** {supported | timeout *seconds*}

**no ethernet oam remote-loopback** {supported | timeout}

Syntax Description	supported	Supports the remote loopback functionality.
	timeout	Sets a master loopback timeout setting.
	<i>seconds</i>	Integer from 1 to 10 that is the number of seconds of the timeout period.

**Command Default** Remote loopback is not supported.

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

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** This command enables the support of OAM remote-loopback on an interface. Only after this functionality is enabled can the local OAM client initiate the OAM remote loopback operation. Changing this setting causes the local OAM client to exchange configuration information with its remote peer.

The **no** form of the command is rejected if the interface is in the loopback mode.



**Note** To start Ethernet OAM remote loopback on a switch port, you must first configure the **access-group mode prefer port** command in interface configuration mode.

**Examples** The following example shows how to enable remote loopback support on interface GigabitEthernet 2/1:

```
Router(config)# interface gigabitethernet 2/1
Router(config-if)# ethernet oam remote-loopback supported
```

---

**Related Commands**

---

<b>access-group mode prefer port</b>	Specifies the override modes and the nonoverride modes for an access group and specifies that the ACL mode takes precedence if ACLs are configured.
<b>ethernet oam remote-loopback</b>	Turns on or off the remote loopback functionality.

---

# ethernet uni

To set user-network interface (UNI) bundling attributes, use the **ethernet uni** command in interface configuration mode. To return to the default bundling configuration, use the **no** form of this command.

**ethernet uni** [**bundle** [**all-to-one**] | **id** *uni-id* | **multiplex**]

**no ethernet uni**

## Syntax Description

<b>bundle</b>	(Optional) Configures the UNI to support bundling without multiplexing.
<b>all-to-one</b>	(Optional) Configures the UNI to support bundling with a single Ethernet virtual connection (EVC) at the UNI and all CE VLANs mapped to that EVC.
<b>id</b>	(Optional) Configures a UNI ID.
<i>uni-id</i>	(Optional) String of 1 to 64 alphanumeric characters that identifies the UNI. The name should be unique for all UNIs that are part of a given service instance.
<b>multiplex</b>	(Optional) Configures the UNI to support multiplexing without bundling.

## Command Default

If bundling or multiplexing attributes are not configured, the default is bundling with multiplexing. The UNI then has one or more EVCs with one or more CE VLANs mapped to each EVC.

## Command Modes

Interface configuration (config-if)

## Command History

Release	Modification
12.2(25)SEG	This command was introduced.
12.2(33)SRB	This command was implemented on the Cisco 7600 series routers.

## Usage Guidelines

UNI options determine the functionality that the interface has regarding bundling VLANs and multiplexing EVCs.

If you want only the bundling or only the multiplexing service, you must configure the service appropriately. Bundling supports only one EVC at the UNI with one or multiple customer edge (CE)-VLAN IDs mapped to the EVC.

When multiplexing is configured, the UNI can have one or more EVCs with a single CE-VLAN ID mapped to each EVC.

When you configure a UNI ID on a port, that ID is used as the default name for all maintenance end points (MEPs) configured on the port.

You must enter the **ethernet uni** command with the **id** keyword and *id* argument on all ports that are directly connected to CE devices. When the specified ID is not unique on a device, an error message is displayed.

When you configure, change, or remove a UNI service type, the EVC and CE-VLAN ID configurations are checked to ensure that the configurations and the UNI service types match. If the configurations do not match, the command is rejected.

---

**Examples**

The following example shows how to configure bundling without multiplexing:

```
Router(config)# interface ethernet 2/1  
Router(config-if)# ethernet uni bundle
```

This example shows how to identify a UNI as test2:

```
Router(config)# interface ethernet 2/1  
Router(config-if)# ethernet uni id test2
```

---

**Related Commands**

Command	Description
<b>show ethernet service interface</b>	Displays information about Ethernet service instances on an interface, including service type.

# id (CFM)

To configure a maintenance domain identifier (MDID), use the **id** command in Ethernet connectivity fault management (CFM) configuration mode. To remove a MDID, use the **no** form of this command.

```
id {mac-address domain-number | dns dns-name | null}
```

```
no id
```

## Syntax Description

<i>mac-address</i>	MAC address of the maintenance domain.
<i>domain-number</i>	Integer in the range of 0 to 65535.
<b>dns</b>	Specifies a domain name service (DNS).
<i>dns-name</i>	String of a maximum of 43 characters.
<b>null</b>	Indicates there is not a domain name.

## Command Default

A MDID is not configured.

## Command Modes

Ethernet CFM configuration (config-ecfm)

## 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

If the MDID is not specified, the domain name in string format is used as the default. If a DNS name exceeds 43 characters, the MDID is only the first 43 characters of that DNS name.

If the MDID is explicitly null, the maintenance association ID (MAID) is constructed from the short maintenance association name. The short maintenance association name needs to be unique globally if the MDID is null.

## Examples

The following example shows how to configure a MDID with a MAC address and a domain number:

```
Router(config)# ethernet cfm domain customerA level 5
Router(config-ecfm)# id aaaa.bbbb.cccc 1017
```

# input

To enable Precision Time Protocol input clocking using a 1.544Mhz, 2.048Mhz, or 10Mhz timing interface or phase using the 1PPS or RS-422 interface, use the **input** command in global configuration mode. To disable PTP input, use the **no** form of this command.

**input** [**1pps**] *slot/bay*

**no input** [**1pps**] *slot/bay*

## Syntax Description

<b>1pps</b>	Configures the router to receive 1 pulse per second (1PPS) time of day messages using the RS422 port or 1PPS port. You can select 1PPS with or without selecting a timing port.
<i>slot</i>	Slot of the 1PPS interface.
<i>bay</i>	Bay of the 1PPS interface.

## Command Default

No default behavior or values.

## Command Modes

Global configuration (config)

## Command History

Release	Modification
12.2(31)SB2	This command was introduced.

## Usage Guidelines

If you are using GPS to provide clock source to the router, configure this command in PTP master mode. This command only applies to platforms that have a 1PPS port.

## Examples

The following example shows how to configure PTP input clocking:

```
Router# configure terminal
Router(config)# ptp clock ordinary domain 0
Router(config-ptp-clk)# input 1pps 3/1
Router(config-ptp-clk)# clock-port masterport master
```

## Related Commands

Command	Description
<b>output</b>	Enables output of time of day messages using the 1PPS interface.

# lACP active-port distribution automatic

To have an effective auto interleaved port priority distribution of active and bundled ports across different slots that are part of the same port channel distributed EtherChannel (DEC) and multichassis EtherChannel (MEC), use the **lACP active-port distribution automatic** command in port channel configuration mode.

**lACP active-port distribution automatic**

**no lACP active-port distribution automatic**

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

**Command Default** Auto interleaved port priority is disabled.

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

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.2(33)SXI4	This command was introduced.

**Usage Guidelines** The auto interleaved port-priority feature automatically distributes active and bundled ports based on the position of a port link when it comes up and is effective only if you configure it on the system that has the higher LACP system priority.

The port priority per port that you configured continues to take precedence over a dynamic port number. You need to perform a shutdown and no shutdown on the interface port channel to enable the auto interleaved port priority feature on all ports.

**Examples** This example shows how to configure interleaved port priority:

```
Router(config)# interface port23
Router(config-if)# lACP active-port distribution automatic
Please shut/no shut the port-channel for configuration to take effect immediately.
Router(config-if)# shutdown
Router(config-if)# no shutdown
Router(config-if)# end
```

This example shows how to verify that interleaved port priority is configured:

```
Router# show running interface port23
```

```
Building configuration...
Current configuration : 81 bytes
!
interface Port-channel23
no switchport
no ip address
lacp max-bundle 4
lacp active-port distribution automatic
end
```

```
Router# show etherchannel 23 summary
```

```
Flags: D - down P - bundled in port-channel
I - stand-alone s - suspended
H - Hot-standby (LACP only)
R - Layer3 S - Layer2
U - in use N - not in use, no aggregation
f - failed to allocate aggregator
M - not in use, no aggregation due to minimum links not met
m - not in use, port not aggregated due to minimum links not met
u - unsuitable for bundling
d - default port
w - waiting to be aggregated
Number of channel-groups in use: 9
Number of aggregators: 9
Group      Port-channel Protocol      Ports
-----+-----+-----+-----
23         Po23(RU)          LACP          Gi1/1/21(P) Gi1/1/22(P) Gi1/1/23(P)
                                     Gi1/1/24(P) Gi2/1/17(H) Gi2/1/18(H)
                                     Gi2/1/19(H) Gi2/1/20(H)
Last applied Hash Distribution Algorithm: Fixed
```


**Note**

The four active and bundled ports are from the same chassis and slot.

**Related Commands**

Command	Description
<b>show etherchannel</b>	Displays EtherChannel information for a port channel.

# lacp direct-loadswap

To enable Link Aggregation Control Protocol (LACP) direct load swapping on a port channel, use the **lacp direct-loadswap** command in interface port-channel configuration mode. To return to the default setting, use the **no** form of this command.

**lacp direct-loadswap**

**no lacp direct-loadswap**

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

**Command Default** Direct loadswapping is disabled.

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

Command History	Release	Modification
	12.2(33)SRC	This command was introduced.

**Usage Guidelines** Use this command to enable the LACP Single Fault Direct Load Balance Swapping feature on a port channel. This command can be used for only a single bundled port failure. If a second failure occurs before the first failure recovers, the loadshare bits for member links are recomputed.

**Examples** This example shows how to enable LACP single fault direct load swapping on port channel 1:

```
Router(config)# interface port-channel 1
Router(config-if)# lacp direct-loadswap
```

Related Commands	Command	Description
	<b>interface port-channel</b>	Creates a port-channel virtual interface and places the CLI in interface configuration mode.
	<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.

# lACP failover

To set the Multi-chassis Link Aggregation Control Protocol (mLACP) failover mechanism to bring down the active physical member link interface(s) for the given link aggregation group (LAG) on the Point of Attachment (PoA) that is surrendering its active status, use the **lACP failover** command in port-channel interface configuration mode. To return to the default setting, use the **no** form of this command.

**lACP failover** { **brute-force** | **non-revertive** }

**no lACP failover**

Syntax Description	brute-force	Non-revertive mode is used to limit failover and possible traffic loss when a failed PoA recovers by not reverting to the Active role.
	Brute-force failover places the PoA links in the ERR_DISABLE state.	
	non-revertive	

**Command Default** Default values are revertive (with 180-second delay) and dynamic port priority change failover.

**Command Modes** Port-channel interface configuration (config-if)

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

**Usage Guidelines**

The default failover mechanism, dynamic port priority, provides the best failover performance.

A brute-force shutdown doesn't depend on the dual-homed device's (DHD's) ability to handle dynamic port priority changes and compensates for deficiencies in the DHD's LACP implementation.

The brute-force mode and non-revertive mode are mutually exclusive—they can not be used together.

The brute-force shutdown changes the status of each member link to ERR\_DISABLE to force the transition of the standby links to active state. This process eliminates the ability of the local LACP implementation to monitor link state.

A brute force shutdown operates in revertive mode—so dynamic port priorities cannot be used to control active selection.

Dynamic port priority functionality is used by the mLACP feature to provide “revertive mode” and “non-revertive mode.”

Non-revertive mode is used to limit failover and, therefore, possible traffic loss. Dynamic port priority changes are utilized to ensure that the newly activated Point of Attachment (PoA) remains active after the failed PoA recovers.

Revertive mode operation forces the configured primary PoA to return to active state after it recovers from a failure. Dynamic port priority changes are utilized when necessary to allow the recovering PoA to resume its active role.

---

**Examples**

This example shows how to set the LACP failover for non-revertive:

```
interface Port-channel1
  lACP max-bundle 3
  lACP min-bundle 2
  lACP failover non-revertive
  mLAG lag-priority 1000
  mLAG interchassis group 1
  service instance 100 ethernet
    encapsulation dot1q 100
    bridge-domain 100 c-mac
```

---

**Related Commands**

Command	Description
<b>errdisable recovery cause mLAG-minlink</b>	Enables automatic recovery from a failover state of the port channel and specifies the interval for recovery.
<b>interface port-channel</b>	Creates a port-channel virtual interface and puts the CLI in interface configuration mode.

---

# lACP fast-switchover

To enable Link Aggregation Control Protocol (LACP) 1:1 link redundancy, use the **lACP fast-switchover** command in interface configuration mode. To disable LACP 1:1 link redundancy, use the **no** form of this command.

**lACP fast-switchover**

**no lACP fast-switchover**

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

**Command Default** LACP 1:1 link redundancy is disabled by default.

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

## Command History

Release	Modification
12.2(33)SXH	This command was introduced.
12.2(33)SRC	This command was integrated into Cisco IOS Release 12.2(33)SRC.
12.2(33)SB	Support for this command was implemented on the Cisco 10000 series router and integrated into Cisco IOS Release 12.2(33)SB. The time allowed for a link switchover was modified from the default of 2 seconds to 250 milliseconds.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5

## Usage Guidelines

Prior to entering the **lACP fast-switchover** command, you must ensure the following:

- The port channel protocol type is LACP.
- The **lACP max-bundle 1** command has been entered on the port channel. The **lACP fast-switchover** command will not affect the **lACP max-bundle** command.

When you enable LACP 1:1 link redundancy, based on the system priority and port priority, the port with the higher system priority chooses the link as the active link and the other link as the standby link. When the active link fails, the standby link is selected as the new active link without taking down the port channel. When the original active link recovers, it reverts to its active link status. During this change-over, the port channel is also up.



### Note

We recommend that you configure two ports only (one active and one hot-standby) in the bundle for optimum performance.

You can enter this command on any port channels with different EtherChannel protocol types of LACP, Port Aggregation Protocol (PAgP), or Fast EtherChannel (FEC).

---

**Examples**

This example shows how to enable LACP 1:1 link redundancy:

```
Router(config-if)# lACP fast-switchover
```

This example shows how to disable LACP 1:1 link redundancy:

```
Router(config-if)# no lACP fast-switchover
```

---

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>lACP max-bundle</b>	Assigns and configures an EtherChannel interface to an EtherChannel group.
<b>show etherchannel</b>	Displays the EtherChannel information for a channel.

# lACP max-bundle

To define the maximum number of active bundled Link Aggregation Control Protocol (LACP) ports allowed in a port channel, use the **lACP max-bundle** command in interface configuration mode. To return to the default settings, use the **no** form of this command.

**lACP max-bundle** *max-bundles*

**no lACP max-bundle**

## Syntax Description

*max-bundles*

Maximum number of active bundled ports allowed in the port channel. Valid values are from 1 to 8. On the Cisco ASR 1000 series router, valid values are 1 to 4.

The default settings are as follows:

- Maximum of 8 bundled ports per port channel.
- Maximum of 8 bundled ports and 8 hot-standby ports per port channel if the port channels on both sides of the LACP bundle are configured in the same way.
- On the Cisco 10000 series router, maximum of 8 bundled ports per port channel.

## Command Default

A maximum number of active bundled ports is not configured.

## Command Modes

Interface configuration (config-if)

## Command History

Release	Modification
12.2(18)SXD	Support for this command was introduced on the Supervisor Engine 720.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(31)SB2	Support for this command was implemented on the Cisco 10000 series router and 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.
12.2(33)SB	On the Cisco 10000 series router, the maximum number of bundled ports per port channel was increased from 4 to 8.
Cisco IOS XE Release 2.4	This command was integrated into Cisco IOS XE Release 2.4.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.

**Usage Guidelines**

The value specified in the *max-bundles* argument determines the number of active links that are bundled in the port channel. The remaining links are in hot-standby mode.

On the Cisco 10000 series router, this command requires a Performance Routing Engine 2 (PRE2) or PRE3.

**Examples**

This example shows how to set 3 ports to bundle in port channel 2:

```
Router(config)# interface port-channel 2  
Router(config-if)# lACP max-bundle 3
```

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>interface port-channel</b>	Creates a port-channel virtual interface and puts the CLI in interface configuration mode.
<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.

# lACP min-bundle

To set the minimum number of active links in a Link Aggregation Control Protocol (LACP) bundle, use the **lACP min-bundle** command in interface configuration mode. To return to the default settings, use the **no** form of this command.

**lACP min-bundle** *min-bundle*

**no lACP min-bundle**

## Syntax Description

*min-bundle* Minimum number of bundled ports allowed in the port channel. Valid values are from 1 to 8. The default is 1.

## Command Default

The port-channel operational state will be “Down” only when there are no active links in the channel. If there are one or more active links, the port-channel state will be “Up.”

## Command Modes

Interface configuration (config-if)

## Command History

Release	Modification
12.2(33)SB	This command was introduced.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.

## Usage Guidelines

Use the **lACP min-bundle** command to configure the minimum number of active links allowed in an LACP bundle. When the number of active links falls below this minimum threshold, the port channel shuts down.



**Note** LACP and the same minimum bundle value must be configured on each peer for both sides of the port channel to be brought down.

### Cisco 10000 Series Router

This command requires a Performance Routing Engine 2 (PRE2) or PRE3.

## Examples

This example shows how to set the minimum number of active links to 5 ports:

```
Router(config-if)# lACP min-bundle 5
```

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>interface port-channel</b>	Creates a port-channel virtual interface and puts the CLI in interface configuration mode.
<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.

# lacp port-priority

To set the priority for a physical interface, use the **lacp port-priority** command in interface configuration mode. To return to the default setting, use the **no** form of this command.

**lacp port-priority** *priority*

**no lacp port-priority**

<b>Syntax Description</b>	<i>priority</i>	Integer from 1 to 65535 that indicates the priority for the physical interface. The default is 32768. <ul style="list-style-type: none"> <li>On the Cisco ASR 1000 series router, the range is 0 to 65535.</li> </ul>
---------------------------	-----------------	---

<b>Command Default</b>	The default port priority is set.
------------------------	-----------------------------------

<b>Command Modes</b>	Interface configuration (config-if)
----------------------	-------------------------------------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.1(13)EW	This command was introduced on the Cisco Catalyst 4500 series switches.
	12.2(14)SX	Support for this command on the Supervisor Engine 720 was integrated into Cisco IOS Release 12.2(14)SX.
	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(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.

<b>Usage Guidelines</b>	You may assign a port priority to each port on a device running Link Aggregation Control Protocol (LACP). You can specify the port priority by using the <b>lacp port-priority</b> command at the command-line interface (CLI) or use the default port priority (32768) that is carried as part of the LACP protocol data unit (PDU) exchanged with the partner. Port priority is used to decide which ports should be put in standby mode when a hardware limitation or the <b>lacp max-bundle</b> command configuration prevents all compatible ports from aggregating. Priority is supported only on port channels with LACP-enabled physical interfaces.
-------------------------	--



**Note** A high priority number means a low priority.

Port priority together with port number form a port identifier.

To verify the configured port priority, issue the **show lACP internal** command.

---

**Examples**

This example shows how to set a priority of 23700 for an interface:

```
Router(config-if)# lACP port-priority 23700
Router(config-if)#
```

---

**Related Commands**

Command	Description
<b>channel-group</b>	Assigns and configures an EtherChannel interface to an EtherChannel group.
<b>debug lACP</b>	Enables debugging of LACP activities.
<b>lACP max-bundle</b>	Defines the maximum number of active bundled LACP ports allowed in a port channel.
<b>lACP system-priority</b>	Sets the priority of the system.
<b>show lACP internal</b>	Displays information about LACP activity on the device.

# lacp rate

To set the rate at which Link Aggregation Control Protocol (LACP) control packets are ingressed to an LACP-supported interface, use the **lacp rate** command in interface configuration mode. To return to the default settings, use the **no** form of this command.

**lacp rate** { **normal** | **fast** }

**no lacp rate**

## Syntax Description

<b>normal</b>	Specifies that LACP control packets are ingressed at the normal rate, every 30 seconds after the link is bundled.
<b>fast</b>	Specifies that LACP control packets are ingressed at the fast rate, once every 1 second.

## Defaults

The default ingressed rate for control packets is 30 seconds after the link is bundled.

## Command Modes

Interface configuration (config-if)

## Command History

Release	Modification
12.2(18)SXF2	This command was introduced on the Catalyst 6500 series switch.
12.2(33)SRC	This command was integrated into Cisco IOS Release 12.2(33)SRC.

## Usage Guidelines

Use this command to modify the duration of a LACP timeout. The LACP timeout value is set on Cisco switches to a value of 90 seconds. Using the **lacp rate** command, you can select the LACP timeout value for a switch to be either 30 seconds or 1 second.

This command is supported only on LACP-enabled interfaces.

## Examples

This example shows how to specify the fast (1-second) ingress rate on interface Ethernet 0/1:

```
Router(config)# interface ethernet 0/1
Router(config-if)# lacp rate fast
```

## Related Commands

Command	Description
<b>show lacp</b>	Displays LACP information.

# lACP system-priority

To set the priority for a system, use the **lACP system-priority** command in global configuration mode. To return to the default setting, use the **no** form of this command.

**lACP system-priority** *priority*

**no lACP system-priority**

## Syntax Description

*priority* Integer from 1 to 65535 that indicates the priority for the system. The default is 32768.

- On the Cisco ASR 1000 series router, the range is 0 to 65535.

## Command Default

The default system priority is set.

## Command Modes

Global configuration (config)

## Command History

Release	Modification
12.1(13)EW	This command was introduced on the Cisco Catalyst 4500 series switches.
12.2(14)SX	Support for this command on the Supervisor Engine 720 was integrated into Cisco IOS Release 12.2(14)SX.
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(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

You can assign a system priority to each device running Link Aggregation Control Protocol (LACP). You can specify the system priority by using the **lACP system-priority** command at the command-line interface (CLI) or use the default system priority (32768) that is carried as part of the LACP protocol data unit (PDU) exchanged with the partner. System priority is used with the MAC address of the device to form the system ID and also is used during negotiation with other systems. Priority is supported only on port channels with LACP-enabled physical interfaces.



**Note** A high priority number means a low priority.

To verify the configured system priority, issue the **show lACP internal** command.

---

**Examples**

The following example shows how to set a system priority of 25500 for a device:

```
Router(config)# lACP system-priority 25500
```

---

**Related Commands**

Command	Description
<b>channel-group</b>	Assigns and configures an EtherChannel interface to an EtherChannel group.
<b>debug lACP</b>	Enables debugging of LACP activities.
<b>lACP port-priority</b>	Sets the priority of a port.
<b>show lACP internal</b>	Displays information about LACP activity on the device.

## level (CFM-AIS-link)

To configure a maintenance level to receive Alarm Indication Signal (AIS) frames transmitted by a link-status change (server maintenance endpoint [SMEP]), use the **level** command in CFM SMEP AIS configuration mode. To remove the maintenance level, use the **no** form of this command.

**level** *level-id*

**no level**

### Syntax Description

<i>level-id</i>	Integer from 0 to 7 that specifies the maintenance level.
-----------------	---

### Command Default

A maintenance level is not configured.

### Command Modes

CFM SMEP AIS configuration (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

This command allows you to transmit AIS messages to a higher level maintenance association without configuring a maintenance intermediate point (MIP) for the service.

### Examples

The following example shows how to configure maintenance level 5 as the level to receive AIS frames transmitted by a link-status change:

```
Router(config)# ethernet cfm ais link-status global
Router(config-ais-link-cfm)# level 5
```

# lldp

To enable and configure Link Layer Discovery Protocol (LLDP), use the **lldp** command in global configuration mode. To disable LLDP, use the **no** form of this command.

**lldp** { **holdtime** *seconds* | **reinit** *delay* | **run** | **timer** *rate* | **tlv-select** *tlv* }

**no lldp** { **holdtime** | **reinit** | **run** | **timer** | **tlv-select** *tlv* }

## Syntax Description

<b>holdtime</b> <i>seconds</i>	Specifies the length of time that the receiver must keep the packet. Integer in the range from 0 to 65535 that specifies the length of time, in seconds, that the receiver must keep the packet. The default is 120.
<b>reinit</b> <i>delay</i>	Specifies a delay for LLDP initialization on an interface. Integer in the range from 2 to 5 that specifies the length of time, in seconds, that LLDP should wait to initialize. The default is 2.
<b>run</b>	Enables LLDP.
<b>timer</b> <i>rate</i>	Specifies a rate at which LLDP packets are sent. Integer in the range from 5 to 65534 that specifies how often, in seconds, the Cisco IOS software sends LLDP updates. The default is 30.
<b>tlv-select</b> <i>tlv</i>	Specifies the time-length-value (TLV) elements to send. String that identifies the TLV element to use. Valid values are: <ul style="list-style-type: none"> <li>• <b>mac-phy-cfg</b>—IEEE 802.3 MAC/Phy configuration/status TLV</li> <li>• <b>management-address</b>—Management address TLV</li> <li>• <b>port-description</b>—Port description TLV</li> <li>• <b>port-vlan</b>—Port VLAN ID TLV</li> <li>• <b>system-capabilities</b>—System capabilities TLV</li> <li>• <b>system-description</b>—System description TLV</li> <li>• <b>system-name</b>—System name TLV</li> </ul>

## Command Default

LLDP is globally disabled. No LLDP advertisements are sent.

## Command Modes

Global configuration (config)

## Command History

Release	Modification
12.2(37)SE	This command was introduced.
12.2(44)SE	This command was modified. The command default was changed to disabled.
12.2(44)SG	This command was integrated into Cisco IOS Release 12.2(44)SG.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.

---

**Usage Guidelines**

To enable LLDP, use this command with the **run** keyword.

LLDP packets are sent with a hold-time value. The receiving device ages the LLDP information about the neighbor after the hold time has elapsed.

LLDP is an industry standard version for Cisco Discovery Protocol (CDP). Non-Cisco phones use LLDP to configure voice VLANs. If you install a non-Cisco phone that supports LLDP and do not want to configure a voice VLAN on the phone, then you can use LLDP.

---

**Examples**

The following example shows how to configure a hold time of 100 seconds:

```
Router(config)# lldp holdtime 100
```

The following example shows how to set the timer to send LLDP updates every 75 seconds:

```
Router(config)# lldp timer 75
```

---

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>show lldp</b>	Displays global LLDP information.

---

# lldp (interface)

To enable Link Layer Discovery Protocol (LLDP) on an interface, use the **lldp** command in interface configuration mode. To disable LLDP on an interface, use the **no** form of this command.

```
lldp { med-tlv-select tlv | receive | transmit }
```

```
no lldp { med-tlv-select tlv | receive | transmit }
```

## Syntax Description

<b>med-tlv-select</b>	Selects an LLDP Media Endpoint Discovery (MED) time-length-value (TLV) element to send.
<i>tlv</i>	String that identifies the TLV element. Valid values are the following: <ul style="list-style-type: none"> <li>• <b>inventory-management</b>—LLDP MED Inventory Management TLV</li> <li>• <b>network-policy</b>—LLDP MED Network Policy TLV</li> <li>• <b>power-management</b>—LLDP MED Power Management TLV</li> </ul>
<b>receive</b>	Enables an interface to receive LLDP transmissions.
<b>transmit</b>	Enables LLDP transmission on an interface.

## Command Default

LLDP is enabled on supported interfaces.

## Command Modes

Interface configuration (config-if)

## Command History

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

## Usage Guidelines

This command is supported on 802.1 media types.

## Examples

The following example shows how to disable LLDP transmission on interface Ethernet 0/1:

```
Router# configure terminal
Router(config)# interface ethernet 0/1
Router(config-if)# no lldp transmit
```

The following example shows how to enable LLDP transmission on interface Ethernet 0/1:

```
Router# configure terminal
Router(config)# interface ethernet 0/1
Router(config-if)# lldp transmit
```

## Related Commands

Command	Description
<b>lldp</b>	Enables LLDP globally.

# location

To provide a description of the location of a serial device, use the **location** command in line configuration mode. To remove the description, use the **no** form of this command.

**location** *text*

**no location**

Syntax Description	<i>text</i>
	Location description.

Command Default	A location description is not provided.
-----------------	---

Command Modes	Line configuration (config-line)
---------------	----------------------------------

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

Usage Guidelines	The <b>location</b> command enters information about the device location and status. Use the <b>show users all EXEC</b> command to display the location information.
------------------	--

Examples	In the following example, the location description for the console line is given as “Building 3, Basement”:
----------	---

```
Router(config)# line console
Router(config-line)# location Building 3, Basement
```

Related Commands	Command	Description
	<b>show users</b>	Displays information about the active lines on a router.

# location (interface)

To configure location information for an interface, use the **location** command in interface configuration mode. To remove the location information for an interface, use the **no** form of this command.

```
location { additional-location-information word | civic-location-id id [port-location] |
elin-location-id id }
```

```
no location { additional-location-information word | civic-location-id id [port-location] |
elin-location-id id }
```

## Syntax Description

<b>additional-location-information</b>	Configures additional information for a location or place.
<i>word</i>	A word or phrase that provides additional location information.
<b>civic-location-id</b>	Configures civic location information for an interface.
<b>port-location</b>	(Optional) Specifies port-specific attributes.
<b>elin-location-id</b>	Configures emergency location identifier number (ELIN) for an interface.
<i>id</i>	The ID for the civic location or the ELIN location. The ID range is from 1 to 4095.
<b>Note</b>	The identifier for the civic location in the Link-Layer Discovery Protocol-Media Endpoint Discovery (LLDP-MED) TLV is limited to 250 bytes or less. To avoid error messages about available buffer space during switch configuration, be sure that the total length of all civic location information specified for each civic location ID does not exceed 250 bytes.

## Command Default

Location information for interfaces is not enabled.

## Command Modes

Interface configuration (config-if)

## Command History

Release	Modification
12.2(40)SE	This command was introduced.
12.2(55)SE	This command was modified. The <b>port-location</b> keyword was added.

## Usage Guidelines

You can use the **location** command to configure location support for interfaces. When you configure the **location** command on a specific interface or on several interfaces, the location TLVs are transmitted on the respective interfaces every time CDP messages are sent. After entering the **location civic-location-id id port-location** command, you enter civic location port configuration mode. In this mode, you can enter additional location information for every port. Use the help feature (?) for details on the additional

information that you can configure in this mode. You can configure the common attributes globally and specific attributes per port. If an attribute is configured both globally and on a port, the port configuration has higher priority.

The civic location identifier must not exceed 250 bytes.

---

**Examples**

The following example shows how to enter civic location information for an interface, and to configure additional information for civic location identifier:

```
Router(config)# interface gigabitethernet1/0/1
Router(config-if)# location civic-location-id 1 port-location
Router(config-if-port)# number 3560
Router(config-if-port)# building 10
```

You can verify your settings by entering the **show location civic interface** command.

---

**Related Commands**

Command	Description
<b>location</b>	Configures the location information for an endpoint.
<b>show location</b>	Displays the location information for an endpoint.

# location prefer

To assign a priority for location information on Cisco Discovery Protocol (CDP) messages, use the **location prefer** command in global configuration mode. To disable the priorities assigned to location information on CDP messages, use the **no** form of this command.

**location prefer** { **cdp** | **lldp-med** | **static** } **weight** *priority-value*

**no location prefer** { **cdp** | **lldp-med** | **static** } **weight** *priority-value*

## Syntax Description

<b>cdp</b>	Specifies the priority for CDP.
<b>lldp-med</b>	Specifies the priority for Link-Layer Discovery Protocol-Media Endpoint Discovery (LLDP-MED) protocol.
<b>static</b>	Specifies static location information.
<b>weight</b>	Specifies the priority for the specified protocol or static location information.
<i>priority-value</i>	Priority value. The range is from 0 to 255.

## Command Default

The static location information has the highest priority, followed by CDP and LLDP.

## Command Modes

Global configuration (config)

## Command History

Release	Modification
12.2(55)SE	This command was introduced.

## Usage Guidelines

Location information can either be configured statically or updated dynamically. The location database is populated with the location information that you configure from various modules, such as CDP and LLDP. If the same information is available on multiple modules, the router picks up one source based on the priority configured using the **location prefer** command. Use the **weight** keyword to configure the priority of the location information. A lower numerical value specified for the *priority-value* argument indicates a higher priority.

## Examples

The following example shows how to configure the location information priority for CDP messages:

```
Router(config)# location prefer cdp weight 10
```

## Related Commands

Command	Description
<b>location</b>	Configures location information for an endpoint.
<b>location (interface)</b>	Configures location information for an interface.

