



Ethernet OAM Commands

This module provides command line interface (CLI) commands for configuring Ethernet Operations, Administration, and Maintenance (EOAM) on the .

To use commands of this module, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using any command, contact your AAA administrator for assistance.

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cfm-delay-measurement probe

To measure Ethernet frame delay in the Layer 2 networks, use the **cfm-delay-measurement probe** command in XR EXEC mode.

```
{ cfm-delay-measurement probe [priority number] [send { packet {once
|every number {seconds|minutes|hours}}|burst {once|every number {
seconds|minutes|hours}}}] packet count number interval number seconds
] statistics measure {one-way-delay-ds|one-way-delay-sd|
one-way-jitter-ds|one-way-jitter-sd|round-trip-delay|round-trip-jitter
} aggregate {none|bins number width milliseconds} buckets {archive
number|size number {per-probe|probes}} schedule {now|at hh :mm
[.ss] [day [month [year]]]}|in number {seconds|minutes|hours} [for
duration {seconds|minutes|hours}] [repeat every number {seconds|
minutes|hours} count probes]}
```

Syntax Description

priority <i>number</i>	(Optional) Configures the priority of outgoing SLA probe packets. The range is 0 to 7. The default is to use the COS bits for the egress interface.
send packet once	(Optional) Sends one packet one time.
send packet every <i>number</i> { seconds minutes hours }	(Optional) Sends one packet every specified number of milliseconds, seconds, minutes, or hours, where <i>number</i> is in the following range: <ul style="list-style-type: none"> • 1 to 3600 seconds • 1 to 1440 minutes • 1 to 168 hours
send burst once	(Optional) Specifies that a burst of packets is sent one time. This is the default.

send burst every <i>number</i> { seconds minutes hours }	(Optional) Sends a burst of packets every specified number of seconds, minutes, or hours, where <i>number</i> is in the following range: <ul style="list-style-type: none">• 1–3600 seconds• 1–1440 minutes• 1–168 hours The default is to send a burst every 10 seconds.
packet count <i>number</i>	Specifies the number of packets to be sent in a burst, in the range 2 to 600. The default is 10.
interval <i>number</i> { seconds }	Specifies the time between sending packets in a burst, where <i>number</i> is in the following range: <ul style="list-style-type: none">• 1 to 30 seconds <p>Note The total length of a burst (the packet count multiplied by the interval) must not exceed 1 minute.</p>
packet size <i>bytes</i>	Minimum size of the packet including padding when necessary. The range is 1 to 9000 bytes. This value is the total frame size including the Layer 2 or Layer 3 packet header.

statistics measure

(Optional) Specifies the type of statistics to collect:

- **one-way-delay-ds**—One-way delay statistics from destination to source.
- **one-way-delay-sd**—One-way delay statistics from source to destination.
- **one-way-jitter-ds**—One-way delay jitter from destination to source.
- **one-way-jitter-sd**—One-way delay jitter from source to destination.
- **round-trip-delay**—Round-trip delay statistics.
- **round-trip-jitter**—Round-trip jitter statistics.

All statistics are collected by default.

aggregate none

(Optional) Specifies that statistics are not aggregated into bins, and each statistic is stored individually.

Caution This option can be memory-intensive and should be used with care.

aggregate bins *number*

(Optional) Specifies the number of bins (from 2 to 100) within each bucket to store sample packets from the probe. The default is to aggregate into one bin.

width <i>milliseconds</i>	Specifies the range of the samples to be collected within each bin in milliseconds, from 1 to 10000. Based on the specified width, bins are established in the following way: <ul style="list-style-type: none"> • Delay measurements (round-trip or one-way)—The lower bound of the bins is zero and the first bin's upper limit is 0 plus the specified width, and the last bin is unbounded. • Jitter measurements (round-trip or one-way)—The bins are evenly distributed around zero, with both the lowest and highest numbered bins being unbounded.
buckets archive <i>number</i>	(Optional) Specifies the number of buckets to store in memory from 1 to 100. The default is 100.
buckets size <i>number</i>	(Optional) Specifies the number of buckets to be used for probes from 1 to 100. The default is 1.
per-probe	Specifies that probes span multiple buckets.
probes	Specifies that buckets span multiple probes.
schedule now	(Optional) Specifies that the probe begins as soon as you enter the command. This is the default.
schedule at <i>hh:mm</i>	(Optional) Specifies a specific time at which to start the probe in 24-hour notation.
<i>ss</i>	(Optional) Number of seconds into the next minute at which to start the probe.
day	(Optional) Number in the range 1 to 31 of the day of the month on which to start the probe.

month	(Optional) Name of the month (full word in English) in which to start the probe.
year	(Optional) Year (fully specified as 4 digits) in which to start the probe.
schedule in <i>number</i> { seconds minutes hours }	<p>(Optional) Specifies a relative time, as a number of seconds, minutes or hours from the current time, at which to start the probe, where <i>number</i> is in the following ranges:</p> <ul style="list-style-type: none"> • 1 to 3600 seconds • 1 to 1440 minutes • 1 to 24 hours
for <i>duration</i> { seconds minutes hours }	<p>(Optional) Specifies the length of the probe as a number of seconds, minutes, or hours, where <i>number</i> is in the following ranges:</p> <ul style="list-style-type: none"> • 1 to 3600 seconds • 1 to 1440 minutes • 1 to 24 hours <p>Note The duration should not exceed the interval specified by the repeat every option.</p>
repeat every <i>number</i> { seconds minutes hours }	<p>(Optional) Specifies the interval at which to restart the probe as a number of seconds, minutes, or hours, where <i>number</i> is in the following ranges:</p> <ul style="list-style-type: none"> • 1 to 90 seconds • 1 to 90 minutes • 1 to 24 hours <p>The default is that probes are not repeated, and there is no default interval.</p>

count <i>probes</i>	Specifies the number of probes to run in the range 1–100. There is no default.
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Command Default	None.
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Command Modes	XR EXEC mode
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Command History	Release	Modification
	Release 7.5.3	The commad was introduced.

Usage Guidelines	No specific guidelines impact the use of this command.
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Task ID	Task ID	Operations
	ethernet-services	execute

Examples	This example shows how to configure Ethernet frame delay measurement.
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```

Router(config)#ethernet sla
Router(config-sla)#profile EVC-1 type cfm-delay-measurement
Router(config-sla-prof)#probe
Router(config-sla-prof-pb)#send packet every 1 seconds
Router(config-sla-prof-pb)#schedule
Router(config-sla-prof-pb-schedule)#every 3 minutes for 120 seconds
Router(config-sla-prof-pb-schedule)#statistics
Router(config-sla-prof-pb-stat)#measure round-trip-delay
Router(config-sla-prof-pb-stat-cfg)#buckets size 1 probes
Router(config-sla-prof-pb-stat-cfg)#buckets archive 5

```

clear ethernet cfm ccm-learning-database location

To clear the Continuity Check Message (CCM) learning database, use the **clear ethernet cfm ccm-learning-database location** command in EXEC mode.

clear ethernet cfm ccm-learning-database location {*allnode-id*}

Syntax Description	all Clears the CCM learning database for all interfaces.
	<i>node-id</i> Clears the CCM learning database for the designated node, entered in <i>r ack/slot/module</i> notation.

Command Default No default behavior or values

Command Modes XR EXEC mode

Command History	Release	Modification
	Release 7.3.15	This command was introduced.

Usage Guidelines No specific guidelines impact the use of this command.

Task ID	Task ID	Operations
	ethernet-services	execute

Examples The following example shows how to clear all the CFM CCM learning databases on all interfaces:

```
RP/0/RP0/CPU0:router# clear ethernet cfm ccm-learning-database location all
```

Related Commands	Command	Description
	show ethernet cfm ccm-learning-database, on page 32	Displays the CCM learning database.

clear ethernet cfm interface statistics

To clear the counters for an Ethernet CFM interface, use the **clear ethernet cfm interface statistics** command in XR EXEC mode.

```
clear ethernet cfm interface interface-path-id statistics [location {all | location}]
clear ethernet cfm interface statistics location {allnode-id}
```

Syntax Description

interface-path-id (Optional) Physical interface or virtual interface.

Note Use the **show interfaces** command to see a list of all interfaces currently configured on the router.

For more information about the syntax for the router, use the question mark (?) online help function.

location (Optional only when used with a specified interface) Clears MAC accounting statistics for a designated interface or for all interfaces.

all Clears CFM counters for all interfaces.

node-id Clears CFM counters for a specified interface, using *rack/slot* notation.

Command Default

No default behavior or values

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.3.15	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
ethernet-services	execute

Examples

The following example shows how to clear all the CFM counters from all interfaces:

```
RP/0/RP0/CPU0:router# clear ethernet cfm interface statistics location all
```

Related Commands

Command	Description
show ethernet cfm interfaces statistics, on page 38	Displays the per-interface counters for CFM.

clear ethernet cfm local meps

To clear the counters for all MEPs or a specified MEP, use the **clear ethernet cfm local meps** command in XR EXEC mode.

```
clear ethernet cfm local meps {all | domain domain-name {all | service service-name {all | mep-id id}} | interface interface-name {all | domain domain-name}}
```

Syntax Description

all	Clears counters for all local MEPs.
domain <i>domain-name</i>	String of a maximum of 80 characters that identifies the domain in which the maintenance points reside. Note For more information about the syntax, use the question mark (?) online help function.
service <i>service-name</i>	String of a maximum of 80 characters that identifies the maintenance association to which the maintenance points belong.
mep-id <i>id</i>	Maintenance end point (MEP) ID number. The range for MEP ID numbers is 1 to 8191.
interface <i>interface-name</i>	String of a maximum of 80 characters that identifies the Ethernet interface.

Command Default

No default behavior or values

Command Modes

EXEC (#)

Command History

Release	Modification
Release 7.3.15	This command was introduced.

Usage Guidelines

The following counters are cleared:

- Number of continuity-check messages (CCMs) sent
- Number of CCMs received
- Number of CCMs received out of sequence
- Number of CCMs received, but discarded due to the **maximum-meps** limit
- Number of loopback messages (LBMs), used for CFM ping
- Number of loopback replies (LBRs), used for CFM ping, sent and received
- Number of LBRs received out of sequence
- Number of LBRs received with bad data (such as LBRs containing padding which does not match the padding sent in the corresponding LBM)
- Number of alarm indication signal (AIS) messages sent and received
- Number of lock (LCK) messages received

Task ID	Task ID	Operations
	ethernet-services	execute

Examples

The following example shows how to clear counters for all MEPs:

```
RP/0/RP0/CPU0:router# clear ethernet cfm local meps all
```

Related Commands	Command	Description
	show ethernet cfm local meps, on page 42	Displays information about local MEPs.

clear ethernet cfm offload

To trigger the re-application of Maintenance End Points (MEPs) that have been disabled due to exceeding offload resource limits, use the **clear ethernet cfm offload** command in the XR EXEC mode.



Note This command does not clear any counters or stored statistics for the MEPs.

clear ethernet cfm offload*location**node-id*

Syntax Description **location** *node-id* (Optional) Specifies the location for which the re-application of MEPs needs to be triggered.

Command Default The default action is to clear the CFM offload information for all nodes.

Command Modes XR EXEC mode

Command History	Release	Modification
	Release 7.3.15	This command was introduced.

Usage Guidelines No specific guidelines impact the use of this command.

Task ID	Task ID	Operation
	ethernet-services	execute

Example

This example shows how to execute the **clear ethernet cfm offload** command:

```
RP/0/RP0/CPU0:router# clear ethernet cfm offload
```

clear ethernet cfm peer meps

To clear all peer MEPs or peer MEPs for a specified local MEP, use the **clear ethernet cfm peer meps** command in XR EXEC mode.

clear ethernet cfm peer meps {**all** | **domain** *domain-name* {**all** | **service** *service-name* {**all** | **local mep-id** *id*}} | **interface** *interface-name* {**all** | **domain** *domain-name*}}

all	Clears counters for all peer MEPs.
domain <i>domain-name</i>	String of a maximum of 80 characters that identifies the domain in which the maintenance points reside. Note For more information about the syntax, use the question mark (?) online help function.
service <i>service-name</i>	String of a maximum of 80 characters that identifies the maintenance association to which the maintenance end points belong.
local mep-id <i>id</i>	Local maintenance end point (MEP) ID number. The range for MEP ID numbers is 1 to 8191.
interface <i>interface-name</i>	String of a maximum of 80 characters that identifies the Ethernet interface.

Command Default No default behavior or values

Command Modes XR EXEC mode

Command History	Release	Modification
	Release 7.3.15	This command was introduced.

Usage Guidelines This command removes all received CCMs and corresponding peer MEPs from the database (other than those configured with cross-check). The peer MEPs will be added again when the next CCM is received.

Task ID	Task ID	Operations
	ethernet-services	execute

Examples The following example shows how to clear all peer MEPs:

```
RP/0/RP0/CPU0:router# clear ethernet cfm peer meps all
```

Related Commands	Command	Description
	show ethernet cfm peer meps, on page 48	Displays information about maintenance end points (MEPs) for peer MEPs.

clear ethernet cfm traceroute-cache

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

clear ethernet cfm traceroute-cache {**all** | **domain** *domain-name* {**all** | **service** *service-name* {**all** | **mep-id** *id*}} | **interface** *interface-name* {**all** | **domain** *domain-name*}}

Syntax Description	domain <i>domain-name</i>
	String of a maximum of 80 characters that identifies the domain in which the maintenance points reside.
	Note For more information about the syntax, use the question mark (?) online help function.
	service <i>service-name</i>
	String of a maximum of 80 characters that identifies the maintenance association to which the maintenance end points belong.
	mep-id <i>id</i>
	Maintenance end point (MEP) ID number. The range for MEP ID numbers is 1 to 8191.
	interface <i>interface-name</i>
	String of a maximum of 80 characters that identifies the Ethernet interface.

Command Default No default behavior or values

Command Modes XR EXEC mode

Command History	Release	Modification
	Release 7.3.15	This command was introduced.

Usage Guidelines No specific guidelines impact the use of this command.

Task ID	Task ID	Operations
	ethernet-services	execute

Examples The following example shows how to clear all ethernet cfm traceroute-cache:

```
RP/0/RP0/CPU0:router# clear ethernet cfm traceroute-cache all
```

Related Commands	Command	Description
	show ethernet cfm traceroute-cache, on page 56	Displays the contents of the traceroute cache.

cos (CFM)

To configure the class of service (CoS) for all CFM packets generated by the maintenance end point (MEP) on an interface, use the **cos** command in interface CFM MEP configuration mode. To return to the default CoS, use the **no** form of this command.

cos *cos*

Syntax Description

cos Class of Service for this MEP. The range is 0 to 7.

Command Default

When not configured, the default CoS value is inherited from the Ethernet interface.

Command Modes

Interface CFM MEP configuration (config-if-cfm-mep)

Command History

Release	Modification
Release 7.3.15	This command was introduced.

Usage Guidelines

Configuring the class of service (CoS) on maintenance end points (MEPs) is supported on all Ethernet interfaces.

The specified CoS value is used for all CFM messages transmitted by the MEP, except for the following:

- Loopback and Linktrace replies—These are transmitted using the CoS value received in the corresponding loopback or linktrace message.
- AIS messages—If a different CoS value is specified in the AIS configuration.
- Ethernet SLA probe messages.



Note For Ethernet interfaces, the CoS is carried as a field in the VLAN tag. Therefore, CoS only applies to interfaces where packets are sent with VLAN tags. If the **cos (CFM)** command is executed for a MEP on an interface that does not have a VLAN encapsulation configured, it will be ignored.

Task ID

Task ID	Operations
ethernet-services	read, write

Examples

The following example shows how to configure the class of service (CoS) for a maintenance end point (MEP) on an interface.

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# interface gigabitethernet 0/1/0/1
RP/0/RP0/CPU0:router(config-if)# ethernet cfm mep domain Dm1 service Sv1 mep-id 1
RP/0/RP0/CPU0:router(config-if-cfm-mep)# cos 7
```

Related Commands	Command	Description
	ethernet cfm (interface), on page 18	Enters interface CFM configuration mode.

ethernet cfm (global)

To enter Connectivity Fault Management (CFM) configuration mode, use the **ethernet cfm (global)** command in XR Config mode.

ethernet cfm

Syntax Description This command has no keywords or arguments.

Command Default No default behavior or values

Command Modes XR Config mode

Command History	Release	Modification
	Release 7.3.15	This command was introduced.

Usage Guidelines No specific guidelines impact the use of this command.

Task ID	Task ID	Operations
	ethernet-services	read, write

Examples

The following example shows how to enter the CFM configuration mode.

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# ethernet cfm
RP/0/RP0/CPU0:router(config-cfm)#
```

Related Commands	Command	Description
	ethernet cfm (interface), on page 18	Enters interface CFM configuration mode.
	show ethernet cfm configuration-errors, on page 34	Displays information about errors that are preventing configured CFM operations from becoming active, as well as any warnings that have occurred.
	show ethernet cfm local maintenance-points, on page 40	Displays a list of local maintenance points.
	clear ethernet cfm local meps, on page 10	Clears the counters for all MEPs or a specified MEP.

ethernet cfm (interface)

To enter interface CFM configuration mode, use the **ethernet cfm (interface)** command in interface configuration mode.

ethernet cfm

Syntax Description This command has no keywords or arguments.

Command Default No MEPs are configured on the interface.

Command Modes Interface configuration (config-if)
Subinterface configuration (config-subif)

Command History	Release	Modification
	Release 7.3.15	This command was introduced.

Usage Guidelines No specific guidelines impact the use of this command.

Task ID	Task ID	Operations
	ethernet-services	read, write

Examples The following example shows how to enter interface CFM configuration mode:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router (config)# interface gigabitethernet 0/1/0/1
RP/0/RP0/CPU0:router (config-if)# ethernet cfm
RP/0/RP0/CPU0:router (config-if-cfm)#
```

Related Commands	Command	Description
	cos (CFM), on page 15	Configures the CoS for all CFM packets generated by the MEP on an interface.
	ethernet cfm (global), on page 17	Enters CFM configuration mode.
	mep domain, on page 22	Creates a MEP on an interface.
	show ethernet cfm configuration-errors, on page 34	Displays information about errors that are preventing configured CFM operations from becoming active, as well as any warnings that have occurred.
	show ethernet cfm local maintenance-points, on page 40	Displays a list of local maintenance points.

Command	Description
show ethernet cfm local meps, on page 42	Displays information about local MEPs.

maximum-meps

To configure the maximum number of maintenance end points (MEPs) for a service, use the **maximum-meps** command in CFM domain service configuration mode. To return to the default value, use the no form of this command.

maximum-meps *number*

Syntax Description

number Maximum number of MEPs allowed for this service. The range is 2 to 8190.

Command Default

The default is 100.

Command Modes

CFM domain service configuration (config-cfm-dmn-svc)

Command History

Release	Modification
Release 7.3.15	This command was introduced.

Usage Guidelines

This command configures the maximum number of peer maintenance end points (MEPs). It does not limit the number of local MEPs. The configured **maximum-meps** *number* must be at least as great as the number of configured crosscheck MEPs.

The **maximum-meps** *number* limits the number of peer MEPs, for which local MEPs store continuity-check messages (CCMs). When the limit is reached, CCMs from any new peer MEPs are ignored, but CCMs from existing peer MEPs continue to be processed normally.

The **maximum-meps** *number* also limits the size of the CCM learning database.

Task ID

Task ID	Operations
ethernet-services	read, write

Examples

The following example shows how to configure the maximum number of maintenance end points (MEPs) for a service:

Related Commands

Command	Description
ethernet cfm (global), on page 17	Enters CFM configuration mode.
ethernet cfm (interface), on page 18	Enters interface CFM configuration mode.
service, on page 29	
show ethernet cfm configuration-errors, on page 34	Displays information about errors that are preventing configured CFM operations from becoming active, as well as any warnings that have occurred.

Command	Description
show ethernet cfm local maintenance-points, on page 40	Displays a list of local maintenance points.
show ethernet cfm local meps, on page 42	Displays information about local MEPs.
show ethernet cfm peer meps, on page 48	Displays information about maintenance end points (MEPs) for peer MEPs.

mep domain

To create a maintenance end point (MEP) on an interface, use the **mep domain** command in interface CFM configuration mode. To remove the MEP from the interface, use the **no** form of this command.

mep domain *domain-name* **service** *service-name* **mep-id** *id-number*

Syntax Description

domain *domain-name* Domain in which to create the maintenance end point (MEP).

service *service-name* Operation service in which to create the maintenance end point (MEP).

mep-id *id-number* Maintenance end points (MEP) identifier to assign to this MEP. The range is 1 to 8191.

Command Default

No MEPs are configured on the interface.

Command Modes

Interface CFM configuration (config-if-cfm)

Command History

Release	Modification
Release 7.3.15	This command was introduced.

Usage Guidelines

CFM Maintenance end points (MEPs) are supported on all Ethernet interfaces and VLAN subinterfaces.

This command creates MEPs in the UP MEP state, unless the specified **service** is configured with MEPs in the DOWN MEP state. See the [service](#) command.

Task ID

Task ID	Operations
ethernet-services	read, write

Examples

The following example shows how to create a MEP using an ID of 1 on the CFM domain named DM1 and service named Sv1:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# interface gigabitethernet 0/1/0/1
RP/0/RP0/CPU0:router(config-if)# ethernet cfm
RP/0/RP0/CPU0:router(config-if-cfm)# mep domain Dm1 service Sv1 mep-id 1
```

Related Commands

Command	Description
ethernet cfm (interface) , on page 18	Enters interface CFM configuration mode.
show ethernet cfm configuration-errors , on page 34	Displays information about errors that are preventing configured CFM operations from becoming active, as well as any warnings that have occurred.

mep-id

To enable crosscheck on a maintenance end point (MEP), use the **mep-id** command in CFM MEP crosscheck configuration mode. To disable crosscheck on a MEP, use the **no** form of this command.

mep-id *mep-id-number* [**mac-address** *mac-address*]

Syntax Description	mac <i>mac-address</i>	(Optional) MAC address of the interface upon which the MEP resides, in standard hexadecimal format, hh:hh:hh:hh:hh:hh.
Command Default	Not configured, in which case no crosscheck is performed on the MEP.	
Command Modes	CFM MEP crosscheck configuration (config-cfm-xcheck)	
Command History	Release	Modification
	Release 7.3.15	This command was introduced.

Usage Guidelines This command enables Crosscheck on the maintenance end point (MEP) specified by the MEP ID number (*mep-id-number*). The range for MEP ID numbers is 1 to 8191. Crosscheck is enabled when the first crosscheck MEP is entered.

Repeat this command for every MEP that you want to include in the expected set of MEPs for crosscheck.

Crosscheck detects the following two additional defects for continuity-check messages (CCMs) on peer MEPs:

- Peer MEP missing—A crosscheck MEP is configured, but has no corresponding peer MEP from which to receive CCMs.
- Peer MEP unexpected—A peer MEP is sending CCMs, but no crosscheck MEP is configured for it.



Note If more than one local MEP is configured for a service, all the local MEPs must be included in the list of configured crosscheck MEPs.

Task ID	Task ID	Operations
	ethernet-services	read, write

Examples

The following example shows how to statically define a maintenance end point (MEP) under a service, so that it can be crosschecked.

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# ethernet cfm
RP/0/RP0/CPU0:router(config-cfm)# domain Domain_One level 1 id string D1
RP/0/RP0/CPU0:router(config-cfm-dmn)# service Bridge_Service bridge group BD1 bridge-domain
B1
RP/0/RP0/CPU0:router(config-cfm-dmn-svc)# mep crosscheck
```

```
RP/0/RP0/CPU0:router(config-cfm-xcheck)# mep-id 10
```


ping ethernet cfm

To send Ethernet connectivity fault management (CFM) loopback messages to a maintenance end point (MEP) or MAC address destination from the specified source MEP, and display a summary of the responses, use the **ping ethernet cfm** command in EXEC mode.

```
ping ethernet cfm domain domain-name service service-name {mac-address mac | mep-id id}
source [mep-id source-id] interface interface-path-id [cos cos-val] [count n] [frame-size size]
[data-pattern hex] [interval seconds] [timeout time]
```

Syntax Description

domain <i>domain-name</i>	String of a maximum of 80 characters that identifies the domain in which the maintenance points reside. Note For more information about the syntax, use the question mark (?) online help function.
service <i>service-name</i>	String of a maximum of 80 characters that identifies the maintenance association to which the maintenance points belong.
mac-address <i>mac</i>	6-byte ID number of the MAC address of the destination MEP.
mep-id <i>id</i>	Maintenance end point (MEP) ID number of the destination MEP. The range for MEP ID numbers is 1 to 8191.
source	Source information.
mep-id <i>source-id</i>	(Optional) Maintenance end point (MEP) ID number of the source MEP. The range for MEP ID numbers is 1 to 8191.
interface <i>interface-path-id</i>	Physical interface or virtual interface. Note Use the show interfaces command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.
cos <i>cos-val</i>	(Optional) Class of Service (CoS) value that identifies the class of traffic of the source MEP. The valid values are from 0 to 7.
count <i>n</i>	(Optional) Number of pings as an integer value. The default is 5.
frame-size <i>size</i>	(Optional) Size, as an integer, of the ping frames. Frames are padded to read the specified size. The default is 0 (no padding).
data-pattern <i>hex</i>	(Optional) Hexadecimal value to be used as the data pattern for padding within a ping frame, when padding is required due to the frame-size configuration. The default is 0.
interval <i>seconds</i>	(Optional) Specifies, in seconds, the time between pings. The <i>n</i> argument is entered in seconds. The default is 1 second.

timeout *time* (Optional) Timeout, in seconds, for the ping packet. The default is 2.

Command Modes EXEC mode

Command History	Release	Modification
	Release 7.3.15	This command was introduced.

Usage Guidelines Before you can use this command, a local MEP must be configured for the domain and the interface.

The command displays the following information:

- Number of loopback message being sent
- Timeout period
- Domain name
- Domain level
- Service name
- Source MEP ID
- Interface
- Target MAC address
- MEP ID – If no MEP ID is specified, “No MEP ID specified” is displayed.
- Running time for the current ping operation to complete



Note The remaining information is not displayed until the current ping operation is complete. If the user interrupts the operation during this time (by pressing control-C), the prompt is returned and no further information is displayed. However, all loopback messages continue to be sent.

- Success rate of responses received – displayed as a percentage followed by the actual number of responses
- The round trip time minimum/maximum/average in milliseconds
- Out-of-sequence responses – displayed as a percentage followed by the actual number of out-of-sequence responses when at least one response is received. An out-of-sequence response occurs if the first response does not correspond with the first message sent, or a subsequent response is not the expected next response after a previously received response.
- Bad data responses – displayed as a percentage followed by the actual number of bad data responses when at least one response is received. A bad data response occurs if the padding data in the response does not match the padding data that in the sent message. This can only happen if the sent message is padded using the **frame-size** option.
- Received packet rate – displayed in packets per second when at least two responses are received. This approximate rate of response is the time between the first response received and the last response received, divided by the total number of responses received.

Task ID	Task ID	Operations
	basic-services	execute
	ethernet-services	execute

Examples

The following example shows how to send an Ethernet CFM loopback message:

```
RP/0/RP0/CPU0:router# ping ethernet cfm domain D1 service S1 mep-id 16 source
interface GigabitEthernet 0/0/0/0

Type escape sequence to abort.
Sending 5 CFM Loopbacks, timeout is 2 seconds -
Domain foo (level 2), Service foo
Source: MEP ID 1, interface GigabitEthernet0/0/0/0
Target: 0001.0002.0003 (MEP ID 16):
  Running (5s) ...
Success rate is 60.0 percent (3/5), round-trip min/avg/max = 1251/1349/1402 ms
Out-of-sequence: 0.0 percent (0/3)
Bad data: 0.0 percent (0/3)
Received packet rate: 1.4 pps
```

propagate-remote-status

To trigger an interface to be TX-disabled on fault detection, use the **propagate-remote-status** command in the interface CFM MEP configuration mode. To return to the default behavior, use the **no** form of this command.

propagate-remote-status

Command Default	None				
Command Modes	Interface CFM MEP configuration				
Command History	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>Release 7.9.1</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	Release 7.9.1	This command was introduced.
Release	Modification				
Release 7.9.1	This command was introduced.				
Usage Guidelines	Link Loss Forwarding (LLF) feature uses this command for triggering an interface to be TX-disabled on fault detection.				
Task ID	<table border="1"> <thead> <tr> <th>Task ID</th> <th>Operations</th> </tr> </thead> <tbody> <tr> <td>ethernet-services</td> <td>read, write</td> </tr> </tbody> </table>	Task ID	Operations	ethernet-services	read, write
Task ID	Operations				
ethernet-services	read, write				

Examples

The following example shows how to use the command on an interface:

```
Router# configure
Router(config)# interface GigabitEthernet0/2/0/0
Router(config-if)# ethernet cfm
Router(config-if-cfm)# mep domain dom1 service ser1 mep-id 1
Router(config-if-cfm-mep)# propagate-remote-status
```

service

To associate a service with a domain and enter CFM domain service configuration mode, use the **service** command in CFM domain configuration mode. To remove a service from a domain, use the **no** form of this command.

```
service service-name { down-meps | xconnect group xconnect-group-name { p2p xconnect-name
| mp2mp xconnect-name ce-id ce-id-value remote-ce-id remote-ce-id-value } } [{ id [
icc-based icc-string umc-string ] | [ string text ] | [ number number ] | [ vlan-id id-number
] | [ vpn-id oui-vpnid ] }
```

Syntax Description	
<i>service-name</i>	Administrative name for the service. Case sensitive ASCII string up to 80 characters. Used in conjunction with one of the following service types: <ul style="list-style-type: none"> • down-meps • xconnect
down-meps	Specifies that all MEPs are down and no MIPs are permitted.
xconnect	Specifies the use of a cross connect. Used in conjunction with group and p2p or mp2mp . Note When xconnect is specified, all MEPs are up and MIPs are permitted.
group <i>xconnect-group-name</i>	Specifies the name of the cross connect group.
p2p <i>xconnect-name</i>	Specifies the name of the point-to-point cross connect and enters the Ethernet CFM domain service mode.
mp2mp <i>xconnect-name</i>	Specifies the name of the multipoint-to-multipoint cross connect and enters the Ethernet CFM domain service mode.
ce-id <i>ce-id-value</i>	Specifies the local Customer Edge (CE) identifier.
remote-ce-id <i>remote-ce-id-value</i>	Specifies the remote Customer Edge (CE) identifier.
id	(Optional) Service identifier. Valid service identifiers are: <ul style="list-style-type: none"> • number <i>number</i>—Number from 0 to 65535. • string <i>text</i>—String length no longer than 46 minus MDID length. • vlan-id <i>id-number</i>—Number from 1 to 4094. • vpn-id <i>oui-vpnid</i>—VPN ID in RFC 2685 format (HHH:HHHH)

Command Default If **id** is not specified, the service name is used as the Short MA name.

Command Modes CFM domain configuration (config-cfm-dmn)

Command History	Release	Modification
	Release 7.3.15	This command was introduced.

Usage Guidelines The Short MA Name is the second part of the Maintenance Association Identifier (MAID) in CFM frames. If the Short MA Name (service id) is not specified, the service administrative name is used by default.

Task ID	Task ID	Operations
	ethernet-services	read, write

Examples

The following example shows how to associate a bridge domain service to a domain and enter CFM domain service configuration mode.

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# ethernet cfm
RP/0/RP0/CPU0:router(config-cfm)# domain Domain_One level 1 id string D1
RP/0/RP0/CPU0:router(config-cfm-dmn)# service Bridge_Service bridge group BD1 bridge-domain
B1
RP/0/RP0/CPU0:router(config-cfm-dmn-svc)#
```

The following example shows how to specify that all MEPs are down and no MIPs are permitted, and enter CFM domain service configuration mode.

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# ethernet cfm
RP/0/RP0/CPU0:router(config-cfm)# domain Domain_One level 1 id string D1
RP/0/RP0/CPU0:router(config-cfm-dmn)# service Serv_1 down-meps
RP/0/RP0/CPU0:router(config-cfm-dmn-svc)#
```

The following example shows how to associate a p2p cross connect service to a domain and enter CFM domain service configuration mode.

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# ethernet cfm
RP/0/RP0/CPU0:router(config-cfm)# domain Domain_One level 1 id string D1
RP/0/RP0/CPU0:router(config-cfm-dmn)# service Cross_Connect_1 xconnect group XG1 p2p X1
RP/0/RP0/CPU0:router(config-cfm-dmn-svc)#
```

The following example shows how to enable CFM on a multipoint-to-multipoint cross connect.

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# ethernet cfm
RP/0/RP0/CPU0:router(config-cfm)# domain Domain_One level 1 id string D1
RP/0/RP0/CPU0:router(config-cfm-dmn)# service Cross_Connect_2 xconnect group XG2 mp2mp X2
ce-id 201 remote-ce-id 202
RP/0/RP0/CPU0:router(config-cfm-dmn-svc)#
```

Related Commands

Command	Description
ethernet cfm (global), on page 17	Enters Ethernet CFM configuration mode.
p2p	Enters p2p configuration mode to configure point-to-point cross-connects.
show ethernet cfm configuration-errors, on page 34	Displays information about errors that are preventing configured cfm operations from becoming active, as well as any warnings that have occurred.
show ethernet cfm local maintenance-points, on page 40	Displays all the maintenance points that have been created.
show ethernet cfm local meps, on page 42	Displays information about local MEPs.
show ethernet cfm peer meps, on page 48	Displays other MEPs detected by a local MEP.

show ethernet cfm ccm-learning-database

To display the Continuity Check Message (CCM) learning database, use the **show ethernet cfm ccm-learning-database** command in XR EXEC mode.

show ethernet cfm ccm-learning-database [*location node-id*]

Syntax Description	location <i>node-id</i>	(Optional) Displays the CFM CCM learning database for the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.
---------------------------	-----------------------------------	--

Command Default All CFM ccm-learning-databases on all interfaces are displayed.

Command Modes XR EXEC mode

Command History	Release	Modification
	Release 7.3.15	This command was introduced.

Usage Guidelines The CCM Learning Database is populated by MEPs and MIPs that have received continuity-check messages (CCMs). The information in the CCM Learning Database is used to reply to traceroutes when no applicable entries are found in the main MAC learning table.

Task ID	Task ID	Operations
	ethernet-services	read

Examples

The following example shows how to display all the CFM CCM learning databases on all interfaces:

```
RP/0/RP0/CPU0:router# show ethernet cfm ccm-learning-database

Location 0/0/CPU0:

Domain/Level          Service          Source MAC      Interface
-----
foo/2                  foo              0001.0203.0401 Gi0/0/0/0
foo/2                  foo              0001.0203.0402 PW

Location 0/1/CPU0:

Domain/Level          Service          Source MAC      Interface
-----
foo/2                  foo              0001.0203.0401 XC ID: 0xff000002
```

Table 1: show ethernet cfm ccm-learning-database Field Descriptions

Domain/Level	The domain name and the level of the domain for the maintenance point that received the CCM that caused this entry to be created. This entry will be used to respond to traceroute messages received by maintenance points in this domain.
--------------	--

Service	The name of the service for the maintenance point that received the CCM that caused this entry to be created. This entry will be used to respond to traceroute messages received by maintenance points in this domain.
Source MAC	Source MAC address in the CCM that caused this entry to be created. This entry will be used to respond to traceroute messages targeted at this MAC address.
Interface	The interface through which the CCM entered the router. This will be one of the following: <ul style="list-style-type: none">• An interface or sub-interface name• A pseudowire identification (neighbor address and PW ID)• PW – Indicates the CCM was received through the PW in a cross-connect• XC ID – the internal cross-connect ID value, indicating that the CCM was received through an interface that no longer exists, or is no longer in L2 mode.

show ethernet cfm configuration-errors

To display information about errors that are preventing configured CFM operations from becoming active, as well as any warnings that have occurred, use the **show ethernet cfm configuration-errors** command in XR EXEC mode.

show ethernet cfm configuration-errors [**domain** *domain-name*] [**interface** *type interface-path-id*]

Syntax Description

domain *domain-name* (Optional) Displays information about the specified CFM domain name.

interface *type* (Optional) Displays information about the specified interface type. For more information, use the question mark (?) online help function.

interface-path-id Physical interface or virtual interface.

Note Use the **show interfaces** command to see a list of all interfaces currently configured on the router.

For more information about the syntax for the router, use the question mark (?) online help function.

Command Default

All CFM configuration errors on all domains are displayed.

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.3.15	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
ethernet-services	read

Examples

```
RP/0/RP0/CPU0:router# show ethernet cfm configuration-errors
```

```
Domain fig (level 5), Service bay
```

```
* MIP creation configured using bridge-domain blort, but bridge-domain blort does not exist.
```

```
* An Up MEP is configured for this domain on interface GigabitEthernet0/1/2/3.234 and an Up MEP is also configured for domain blort, which is at the same level (5).
```

```
* A MEP is configured on interface GigabitEthernet0/3/2/1.1 for this domain/service, which has CC interval 100ms, but the lowest interval supported on that interface is 1s.
```

Related Commands

Command	Description
ethernet cfm (global), on page 17	Enters CFM configuration mode.

Command	Description
ethernet cfm (interface), on page 18	Enters interface CFM configuration mode.

show ethernet cfm interfaces ais

To display the information about interfaces that are currently transmitting Alarm Indication Signal (AIS), use the **show ethernet cfm interfaces ais** command in XR EXEC mode.

show ethernet cfm interfaces [*type interface-path-id*] **ais** [**location** *node-id*]

Syntax Description	<p><i>type</i> (Optional) Interface type. For more information, use the question mark (?) online help function.</p> <hr/> <p><i>interface-path-id</i> Physical interface or virtual interface.</p> <p>Note Use the show interfaces command to see a list of all interfaces currently configured on the router.</p> <p>For more information about the syntax for the router, use the question mark (?) online help function.</p> <hr/> <p>location <i>node-id</i> (Optional) Displays information about the node location specified as <i>rack / slot / module</i>. Location cannot be specified if you configure an interface type.</p>
---------------------------	--

Command Default If no parameters are specified, information for all AIS interfaces is displayed.

Command Modes XR EXEC mode

Command History	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>Release 7.3.15</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	Release 7.3.15	This command was introduced.
Release	Modification				
Release 7.3.15	This command was introduced.				

Usage Guidelines The **location** keyword cannot be specified if an interface has been specified.

Task ID	<table border="1"> <thead> <tr> <th>Task ID</th> <th>Operations</th> </tr> </thead> <tbody> <tr> <td>ethernet-services</td> <td>read, write</td> </tr> </tbody> </table>	Task ID	Operations	ethernet-services	read, write
Task ID	Operations				
ethernet-services	read, write				

Examples The following example shows how to display the information published in the Interface AIS table:

```
RP/0/RP0/CPU0:router# show ethernet cfm interfaces ais
```

```
Defects (from at least one peer MEP):
```

```
A - AIS received           I - Wrong interval
R - Remote Defect received V - Wrong Level
L - Loop (our MAC received) T - Timed out (archived)
C - Config (our ID received) M - Missing (cross-check)
X - Cross-connect (wrong MAID) U - Unexpected (cross-check)
P - Peer port down         D - Local port down
```

```
Trigger
```

```
Transmission
```

```

Interface (State)      AIS ----- Via -----
Dir L Defects Levels L Int Last started Packets
-----
Gi0/1/0/0.234 (Up)    Dn  5 RPC      6      7 1s 01:32:56 ago  5576
Gi0/1/0/0.567 (Up)    Up  0 M          2,3    5 1s 00:16:23 ago   983
Gi0/1/0/1.1 (Dn)     Up  D           1!     7 60s 01:02:44 ago 3764
Gi0/1/0/2 (Up)       Dn  0 RX          1!

```

Table 2: show ethernet cfm interfaces ais Field Descriptions

Interface (State)	The name and state of the interface.
AIS dir	The direction that the AIS packets are transmitted, up or down.
Trigger L	The level of the lowest MEP that is transmitting AIS. The field is blank if there are no down MEPs on the interface, and AIS is being transmitted due to configuration on the interface itself.
Trigger Defects	Defects detected by the lowest MEP transmitting AIS.
Via Levels	The levels of any MEPs on the interface that are receiving AIS from a lower MEP, and potentially re-transmitting the signal. If the highest MEP is not re-transmitting the signal, the list of levels is ended using an exclamation point.
Transmission L	The level at which AIS is being transmitted outside of the interface, via a MIP. The field is blank if this is not occurring.
Transmission Int	The interval at which AIS is being transmitted outside of the interface via a MIP. The field is blank if this is not occurring.
Transmission last started	If AIS is being transmitted outside of the interface, the time that the signal started. The field is blank if this is not occurring.
Transmission packets	If AIS is being transmitted outside of the interface, the number of packets sent by the transmitting MEP since it was created or since its counters were last cleared. The field is blank if this is not occurring.

Related Commands

Command	Description
show ethernet cfm local meps	Displays information about local MEPs.

show ethernet cfm interfaces statistics

To display the per-interface counters for Ethernet Connectivity Fault Management (CFM), use the **show ethernet cfm interfaces statistics** command in XR EXEC mode.

show ethernet cfm interfaces [*type interface-path-id*] **statistics** [**location** *node-id*]

Syntax Description	<i>type</i>	(Optional) Interface type. For more information, use the question mark (?) online help function.
	<i>interface-path-id</i>	Physical interface or virtual interface.
	Note	Use the show interfaces command to see a list of all interfaces currently configured on the router.
		For more information about the syntax for the router, use the question mark (?) online help function.
	location <i>node-id</i>	(Optional) Displays information about the node location specified as <i>rack / slot / module</i> . Location cannot be specified if you configure an interface type.

Command Default All CFM counters from all interfaces are displayed.

Command Modes XR EXEC mode

Command History	Release	Modification
	Release 7.3.15	The command is enhanced to retrieve PM statistics from satellite.

Usage Guidelines The location cannot be specified if a particular interface is specified.

Task ID	Task ID	Operations
	ethernet-services	read

Examples

The following example shows all the CFM counters on all interfaces:

```
RP/0/RP0/CPU0:router# show ethernet cfm interfaces statistics
Location 0/1/CPU0:
```

Interface	Malformed	Dropped	Last Malformed	Reason
Gi0/1/0/3.185	0	0		
Gi0/1/0/7.185	0	0		
Gi0/1/0/7.187	0	0		

Table 3: show ethernet cfm statistics Field Descriptions

Interface	Name of the interface.
Malformed	Number of packets that have been received at this interface that have been found to be non-compliant with the packet formats specified in IEEE 802.1ag and ITU-T Y.1731.
Dropped	Number of valid (well-formed) packets that have been received at this interface, that have been dropped in software. Packets may be dropped for the following reasons: <ul style="list-style-type: none"> • Packet has an unknown operation code, and reached a MEP. • Packet dropped at a MEP because it has a lower CFM level than the MEP. • Packet could not be forwarded because the interface is STP blocked. • Packet could not be forwarded because it is destined for this interface.
Last Malformed Reason	Operation code for the last malformed packet received, and the reason that it was found to be malformed. If no malformed packets have been received, this field is blank.

Related Commands

Command	Description
clear ethernet cfm interface statistics, on page 9	Clears the counters for an Ethernet CFM interface.

show ethernet cfm local maintenance-points

To display a list of local maintenance points, use the **show ethernet cfm local maintenance-points** command in XR EXEC mode.

show ethernet cfm local maintenance-points [{**domain** *domain-name* [**service** *service-name*] | **interface** *type* *interface-path-id*}] [{**mep** | **mip**}]

Syntax Description	
domain <i>domain-name</i>	(Optional) Displays information about the specified domain, where <i>domain-name</i> is a string of a maximum of 80 characters that identifies the domain in which the maintenance points reside.
service <i>service-name</i>	(Optional) Displays information about the specified service, where <i>service-name</i> is a string of a maximum of 80 characters that identifies the maintenance association to which the maintenance points belong.
interface <i>type</i>	(Optional) Displays information about the specified interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	Physical interface or virtual interface. Note Use the show interfaces command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.
mep	(Optional) Displays information about maintenance end points (MEPs).
mip	(Optional) Displays information about maintenance intermediate points (MIPs).

Command Default All maintenance points from all interfaces are displayed.

Command Modes XR EXEC mode

Command History	Release	Modification
	Release 7.3.15	This command was introduced.

Usage Guidelines No specific guidelines impact the use of this command.

Task ID	Task ID	Operations
	ethernet-services	read

Examples This example shows how to display maintenance points:

```
RP/0/RP0/CPU0:router# show ethernet cfm local maintenance-points
```


Domain/Level	Service	Interface	Type	ID	MAC
bar/0	bar	Gi0/0/0/0	Dn MEP	1	03:04:00
baz/4	baz	Gi0/0/0/1.1	MIP		03:04:01
baz/4	baz	Gi0/0/0/2	MIP		03:04:02
foo/?	foo	Gi0/0/0/3	MEP	1	03:04:03!
qux/2	qux	Gi0/0/0/1.1	Up MEP	10	03:04:01
qux/2	qux	Gi0/0/0/2	Up MEP	11	03:04:02

Table 4: show ethernet cfm local maintenance-points Field Descriptions

Domain/Level	The domain name and the level of the domain. If the domain is not configured globally, a question mark (?) is displayed for the Level.
Service	The name of the service.
Interface	The interface containing the maintenance point.
Type	The type of maintenance point: <ul style="list-style-type: none"> • MIP • Up MEP • Down MEP • MEP—If the MEP belongs to a service that is not configured globally, the type cannot be determined and just MEP is displayed.
ID	The configured MEP ID. Note Since MIPs do not have an ID, this column is blank for MIPs.
MAC	The last 3 octets of the interface MAC address. Note The first three octets are typically the Cisco OUI.
Note	If the MEP has a configuration error, an exclamation point (!) is displayed at the end of the line in the display output.

Related Commands

Command	Description
clear ethernet cfm local meps, on page 10	Clears the counters for all MEPs or a specified MEP.
clear ethernet cfm peer meps, on page 13	Clears all peer MEPs or peer MEPs for a specified local MEP.
clear ethernet cfm traceroute-cache, on page 14	Removes the contents of the traceroute cache.

show ethernet cfm local meps

To display information about local maintenance end points (MEPs), use the **show ethernet cfm local meps** command in XR EXEC mode.

```
show ethernet cfm local meps [{domain domain-name [service service-name [mep-id id]] | interface
type interface-path-id [domain domain-name]}] [{errors [{detail | verbose}] | detail | verbose}]
```

Syntax Description

domain <i>domain-name</i>	(Optional) Displays information about the specified CFM domain, where <i>domain-name</i> is a string of a maximum of 80 characters that identifies the domain in which the maintenance points reside.
service <i>service-name</i>	(Optional) Displays information about the specified service, where <i>service-name</i> is a string of a maximum of 80 characters that identifies the maintenance association to which the maintenance points belong.
interface <i>type</i>	(Optional) Displays information about the specified interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	Physical interface or virtual interface. Note Use the show interfaces command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.
mep-id <i>id</i>	(Optional) Displays information about the specified MEP, where <i>id</i> is a number of a local maintenance end point (MEP). The range is 1 to 8191.
errors	(Optional) Displays information about peer MEPs with errors.
detail	(Optional) Displays detailed information.
verbose	(Optional) Displays detailed information, plus counters for each type of CFM packet.

Command Default

Brief information is displayed for all local MEPs.

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.3.15	This command was introduced.

Usage Guidelines

All MEPs are displayed in the **show ethernet cfm local meps** command output, unless they have configuration errors.

Task ID

Task ID	Operations
ethernet-services	read

Examples

Example 1: show ethernet cfm local meps Command

This example shows sample output of the default statistics for local MEPs without any filtering:

```
RP/0/RP0/CPU0:router# show ethernet cfm local meps

A - AIS received           I - Wrong interval
R - Remote Defect received V - Wrong Level
L - Loop (our MAC received) T - Timed out (archived)
C - Config (our ID received) M - Missing (cross-check)
X - Cross-connect (wrong MAID) U - Unexpected (cross-check)
P - Peer port down

Domain foo (level 6), Service bar
  ID Interface (State)      Dir MEPS/Err RD Defects AIS
-----
  100 Gi1/1/0/1.234 (Up)    Up      0/0   N  A      L7

Domain fred (level 5), Service barney
  ID Interface (State)      Dir MEPS/Err RD Defects AIS
-----
  2 Gi0/1/0/0.234 (Up)     Up      3/2   Y  RPC     L6

RP/0/0/CPU0:router# show ethernet cfm local meps

A - AIS received           I - Wrong interval
R - Remote Defect received V - Wrong Level
L - Loop (our MAC received) T - Timed out (archived)
C - Config (our ID received) M - Missing (cross-check)
X - Cross-connect (wrong MAID) U - Unexpected (cross-check)
P - Peer port down

Domain foo (level 6), Service bar
  ID Interface (State)      Dir MEPS/Err RD Defects AIS
-----
  100 Gi1/1/0/1.234 (Up)    Up      0/0   N  A

Domain fred (level 5), Service barney
  ID Interface (State)      Dir MEPS/Err RD Defects AIS
-----
  2 Gi0/1/0/0.234 (Up)     Up      3/2   Y  RPC
```

Table 5: show ethernet cfm local meps Field Descriptions

ID	Configured MEP ID of the MEP.
----	-------------------------------

Interface (State)	Interface that the MEP is configured under, and the state of the interface. The states are derived from the interface state, the Ethernet Link OAM interworking state, and the Spanning Tree Protocol (STP) state. The following states are reported: <ul style="list-style-type: none"> • Up – Interface Up, Ethernet Link OAM Up, STP Up • Down – Interface Down or Admin Down • Test – Interface Up, Ethernet Link OAM loopback mode • Blkd – Interface Up, Ethernet Link OAM Up, STP Blocked • Otherwise, the interface state.
Dir	Direction of the MEP.
RD	Remote Defect. Y (yes) indicates that a remote defect is detected on at least one peer MEP. In which case, the RDI bit is set in outgoing CCM messages. Otherwise, N (no).
MEPs	Total number of peer MEPs sending CCMs to the local MEP.
Err	Number of peer MEPs for which at least one error has been detected.
Defects	Types of errors detected. Each error is listed as a single character. Multiple errors are listed if they are from the same MEP. Possible errors are listed at the top of the display output of the command.
AIS	Alarm Indication Signal. If AIS is configured for the service, the configured level is displayed when an alarm is signaled. If AIS is not configured for the service, or if no alarm is currently signaled, this field is blank.

Example 2: show ethernet cfm local meps Command Filtered by Domain and Service

```
RP/0/RP0/CPU0:router# show ethernet cfm local meps domain foo service bar
```

```

A - AIS received           I - Wrong interval
R - Remote Defect received V - Wrong Level
L - Loop (our MAC received) T - Timed out (archived)
C - Config (our ID received) M - Missing (cross-check)
X - Cross-connect (wrong MAID) U - Unexpected (cross-check)
P - Peer port down

```

```
Domain foo (level 6), Service bar
```

```

  ID Interface (State)      Dir  MEPs/Err  RD  Defects  AIS
-----
 100 Gi1/1/0/1.234 (Up)    Up    0/0      N   A        L7

```

```
RP/0/0/CPU0:router# show ethernet cfm local meps domain foo service bar
```

```

A - AIS received           I - Wrong interval
R - Remote Defect received V - Wrong Level
L - Loop (our MAC received) T - Timed out (archived)
C - Config (our ID received) M - Missing (cross-check)
X - Cross-connect (wrong MAID) U - Unexpected (cross-check)
P - Peer port down

```

```
Domain foo (level 6), Service bar
```

ID	Interface (State)	Dir	MEPs/Err	RD	Defects	AIS
100	Gil1/1/0/1.234 (Up)	Up	0/0	N	X	

Example 3: show ethernet cfm local meps detail Command

This example shows sample output of detailed statistics for local MEPs:



Note The Discarded CCMs field is not displayed when the number is zero (0). It is unusual for the count of discarded CCMs to be anything other than zero, since CCMs are only discarded when the limit on the number of peer MEPs is reached. The Peer MEPs field is always displayed, but the counts are always zero when continuity check is not enabled.

```
RP/0/RP0/CPU0:router# show ethernet cfm local meps detail

Domain foo (level 6), Service bar
Up MEP on GigabitEthernet0/1/0/0.234, MEP-ID 100
=====
Interface state: Up      MAC address: 1122.3344.5566
Peer MEPs: 0 up, 0 with errors, 0 timed out (archived)

CCM generation enabled: No
AIS generation enabled: Yes (level: 7, interval: 1s)
Sending AIS:           Yes (started 01:32:56 ago)
Receiving AIS:         Yes (from lower MEP, started 01:32:56 ago)

Domain fred (level 5), Service barney
Up MEP on GigabitEthernet0/1/0/0.234, MEP-ID 2
=====
Interface state: Up      MAC address: 1122.3344.5566
Peer MEPs: 3 up, 2 with errors, 0 timed out (archived)
Cross-check defects: 0 missing, 0 unexpected

CCM generation enabled: Yes (Remote Defect detected: Yes)
CCM defects detected:  R - Remote Defect received
                    P - Peer port down
                    C - Config (our ID received)
AIS generation enabled: Yes (level: 6, interval: 1s)
Sending AIS:           Yes (to higher MEP, started 01:32:56 ago)
Receiving AIS:         No

RP/0/0/CPU0:router# show ethernet cfm local meps detail

Domain foo (level 5), Service bar
Down MEP on GigabitEthernet0/1/0/0.123, MEP-ID 20
=====
Interface state: Up      MAC address: 1122.3344.5566
Peer MEPs: 1 up, 0 with errors, 0 timed out (archived)
Cross-check errors: 0 missing, 0 unexpected

CCM generation enabled: Yes, 10ms
                    CCM processing offloaded to high-priority software
AIS generation enabled: No
Sending AIS:           No
Receiving AIS:         No
```

Example 4: show ethernet cfm local meps verbose Command

This example shows sample output of detailed statistics for local MEPs:

```
RP/0/RP0/CPU0:router# show ethernet cfm local meps verbose

Domain foo (level 6), Service bar
Up MEP on GigabitEthernet0/1/0/0.234, MEP-ID 100
=====
Interface state: Up      MAC address: 1122.3344.5566
Peer MEPs: 0 up, 0 with errors, 0 timed out (archived)

CCM generation enabled: No
AIS generation enabled: Yes (level: 7, interval: 1s)
Sending AIS:           Yes (started 01:32:56 ago)
Receiving AIS:        Yes (from lower MEP, started 01:32:56 ago)
EFD triggered:        No

Packet      Sent      Received
-----
AIS         5576         0
SLM          0          11
SLR          11         0
DMM          0          6
DMR          5          0

Domain fred (level 5), Service barney
Up MEP on GigabitEthernet0/1/0/0.234, MEP-ID 2
=====
Interface state: Up      MAC address: 1122.3344.5566
Peer MEPs: 3 up, 2 with errors, 0 timed out (archived)
Cross-check errors: 0 missing (0 auto), 0 unexpected

CCM generation enabled: Yes, 1s (Remote Defect detected: Yes)
                        CCM processing offloaded to software
CCM defects detected:  R - Remote Defect received
                        P - Peer port down
                        C - Config (our ID received)
AIS generation enabled: Yes (level: 6, interval: 1s)
Sending AIS:          Yes (to higher MEP, started 01:32:56 ago)
Receiving AIS:        No

Packet      Sent      Received
-----
CCM         12345      67890 (out of seq: 6, discarded: 10)
LBM          5          0
LBR          0          5 (out of seq: 0, with bad data: 0)
AIS          0         46910
LMM          3          4
LMR          5          3

Domain gaz (level 4), Service baz
Up MEP on Standby Bundle-Ether 1, MEP-ID 3
=====
Interface state: Up      MAC address: 6655.4433.2211
Peer MEPs: 1 up, 0 with errors, 0 timed out (archived)

CCM generation enabled: Yes, 1s (Remote Defect detected: No)
                        CCM processing offloaded to software
)
CCM defects detected:  Sending disabled on local standby MEP
                        Defects below ignored on local standby MEP
                        I - Wrong interval
                        V - Wrong level
```

```

AIS generation enabled: No
Sending AIS:           No
Receiving AIS:        No

```

```

Packet      Sent      Received
-----
CCM          0        67890 (out of seq: 6, discarded: 10)
LBM          0          1
LBR          0          2 (out of seq: 0, with bad data: 0)
AIS          0          3
LCK          -          4

```

```

Domain bar (level 3), Service boz
Down MEP on GigabitEthernet102/1/0/0.345, MEP-ID 200

```

```

=====
Interface state: Up      MAC address: 1122.3344.5566
Peer MEPS: 0 up, 0 with errors, 0 timed out (archived)

```

```

CCM generation enabled: No
AIS generation enabled: No
Sending AIS:           No
Receiving AIS:        No

```

```

No packets sent/received

```

Related Commands

Command	Description
show ethernet cfm local maintenance-points, on page 40	Displays a list of local maintenance points.
show ethernet cfm peer meps, on page 48	Displays information about maintenance end points (MEPs) for peer MEPS.
show ethernet cfm traceroute-cache, on page 56	Displays the contents of the traceroute cache.

show ethernet cfm peer meps

To display information about maintenance end points (MEPs) for peer MEPs, use the **show ethernet cfm peer meps** command in XR EXEC mode.

```
show ethernet cfm peer meps [{domain domain-name [service service-name [local mep-id id
[peer {mep-id id | mac-address H . H . H}]]] | interface type interface-path-id [domain
domain-name [peer {mep-id id | mac-address H . H . H}]]] [{cross-check [{missing |
unexpected}]] | errors} ] [detail]
```

Syntax Description

cross-check	(Optional) Displays information about peer MEPs with cross-check errors.
detail	(Optional) Displays detailed information.
domain <i>domain-name</i>	(Optional) Displays information about a CFM domain, where <i>domain-name</i> is a string of a maximum of 80 characters that identifies the domain in which the maintenance points reside.
errors	(Optional) Displays information about peer MEPs with errors.
interface <i>type</i>	(Optional) Displays information about the specified interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	Physical interface or virtual interface. Note Use the show interfaces command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.
local mep-id <i>id</i>	(Optional) Displays information about a local MEP, where <i>id</i> is the number of the MEP.
<i>missing</i>	(Optional) Displays information about peer MEPs that are missing.
peer mep-id <i>id</i>	(Optional) Displays information about a peer MEP, where <i>id</i> is the number of the MEP.
peer mac-address <i>H.H.H</i>	(Optional) Displays information about a peer MEP, where <i>H.H.H</i> is the hexadecimal address of the MEP.
service <i>service-name</i>	(Optional) Displays information about a CFM service, where <i>service-name</i> is a string of a maximum of 154 characters that identifies the maintenance association to which the maintenance points belong.
unexpected	(Optional) Displays information about unexpected peer MEPs.

Command Default

Peer MEPs for all domains are displayed.

Command Modes

XR EXEC mode

Command History	Release	Modification
	Release 7.3.15	This command was introduced.

Usage Guidelines If a Local MEP is receiving Wrong Level CCMs, and if the Remote MEP has its CCM processing offloaded, then the last CCM cannot be displayed.

Task ID	Task ID	Operations
	ethernet-services	read

Examples

The following example shows sample output of MEPs detected by a local MEP:

```
RP/0/RP0/CPU0:router# show ethernet cfm peer meps

Flags:
> - Ok                               I - Wrong interval
R - Remote Defect received           V - Wrong level
L - Loop (our MAC received)          T - Timed out
C - Config (our ID received)         M - Missing (cross-check)
X - Cross-connect (wrong MAID)       U - Unexpected (cross-check)
* - Multiple errors received

Domain dom3 (level 5), Service ser3
Down MEP on GigabitEthernet0/0/0/0 MEP-ID 1
=====
St   ID MAC Address   Port   Up/Downtime   CcmRcvd SeqErr   RDI Error
---  ---
V    10 0001.0203.0403 Up     00:01:35     2      0      0      2

Domain dom4 (level 2), Service ser4
Down MEP on GigabitEthernet0/0/0/0 MEP-ID 1
=====
St   ID MAC Address   Port   Up/Downtime   CcmRcvd SeqErr   RDI Error
---  ---
>   20 0001.0203.0402 Up     00:00:03     4      1      0      0
>   21 0001.0203.0403 Up     00:00:04     3      0      0      0

Domain dom5 (level 2), Service dom5
```

Table 6: show ethernet cfm peer meps Field Descriptions

St	Status: one or two characters, representing the states listed at the top of the output.
ID	Peer MEP ID
MAC address	Peer MAC Address. If this entry is a configured cross-check MEP, with no MAC address specified, and no CCMs are currently being received from a peer MEP with a matching MEP ID, then this field is blank.
Port	Port state of the peer, based on the Port Status and Interface Status TLVs. If no TLVs or CCMs have been received, this field is blank. Otherwise, the port status is displayed—unless it is Up. If the port status is Up, then the interface status is displayed.

Up/Downtime	Time since the peer MEP last came up or went down. If CCMs are currently being received, it is the time since the peer MEP last came up, which is the time since the first CCM was received. If CCMs are not currently being received, it is the time since the peer MEP last went down, which is the time since the loss threshold was exceeded and a loss of continuity was detected.
CcmRcvd	Total number of CCMs received from this peer MEP.
SeqErr	Number of CCMs received out-of-sequence.
RDI	Number of CCMs received with the RDI bit set.
Error	Number of CCMs received with CCM defects, such as: <ul style="list-style-type: none"> • Invalid level error • Maintenance Association Identifier (MAID) error • Interval error • Received with out MEP ID error • Invalid source MAC error

This example shows sample detailed output of MEPs detected by a local MEP:

```
RP/0/RP0/CPU0:router# show ethernet cfm peer meps detail
```

```
Domain dom3 (level 5), Service ser3
Down MEP on GigabitEthernet0/0/0/0 MEP-ID 1
```

```
=====
Peer MEP-ID 10, MAC 0001.0203.0403
CFM state: Wrong level, for 00:01:34
Port state: Up
CCM defects detected:    V - Wrong Level
CCMs received: 5
  Out-of-sequence:           0
  Remote Defect received:    5
  Wrong Level:               0
  Cross-connect (wrong MAID): 0
  Wrong Interval:           5
  Loop (our MAC received):   0
  Config (our ID received):  0
```

```
Last CCM received
Level: 4, Version: 0, Interval: 1min
Sequence number: 5, MEP-ID: 10
MAID: String: dom3, String: ser3
Port status: Up, Interface status: Up
```

```
Domain dom4 (level 2), Service ser4
Down MEP on GigabitEthernet0/0/0/0 MEP-ID 1
```

```
=====
Peer MEP-ID 20, MAC 0001.0203.0402
CFM state: Ok, for 00:00:04
Received CCM handling offloaded to software
Port state: Up
CCMs received: 7
  Out-of-sequence:           1
```

```

Remote Defect received:      0
Wrong Level:                0
Cross-connect (wrong MAID): 0
Wrong Interval:             0
Loop (our MAC received):    0
Config (our ID received):   0
Last CCM received
Level: 2, Version: 0, Interval: 10s
Sequence number: 1, MEP-ID: 20
MAID: String: dom4, String: ser4
Chassis ID: Local: ios; Management address: 'Not specified'
Port status: Up, Interface status: Up

Peer MEP-ID 21, MAC 0001.0203.0403
CFM state: Ok, for 00:00:05
Port state: Up
CCMs received: 6
Out-of-sequence:           0
Remote Defect received:    0
Wrong Level:               0
Cross-connect (wrong MAID): 0
Wrong Interval:           0
Loop (our MAC received):   0
Config (our ID received):  0
Last CCM received 00:00:05 ago:
Level: 2, Version: 0, Interval: 10s
Sequence number: 1, MEP-ID: 21
MAID: String: dom4, String: ser4
Port status: Up, Interface status: Up

Domain dom5 (level 2), Service ser5
Up MEP on Standby Bundle-Ether 1 MEP-ID 1
=====
Peer MEP-ID 600, MAC 0001.0203.0401
CFM state: Ok (Standby), for 00:00:08, RDI received
Port state: Down
CCM defects detected:      Defects below ignored on local standby MEP
                          I - Wrong Interval
                          R - Remote Defect received

CCMs received: 5
Out-of-sequence:         0
Remote Defect received:  5
Wrong Level:             0
Cross-connect W(wrong MAID): 0
Wrong Interval:         5
Loop (our MAC received): 0
Config (our ID received): 0
Last CCM received 00:00:08 ago:
Level: 2, Version: 0, Interval: 10s
Sequence number: 1, MEP-ID: 600
MAID: DNS-like: dom5, String: ser5
Chassis ID: Local: ios; Management address: 'Not specified'
Port status: Up, Interface status: Down

Peer MEP-ID 601, MAC 0001.0203.0402
CFM state: Timed Out (Standby), for 00:15:14, RDI received
Port state: Down
CCM defects detected:      Defects below ignored on local standby MEP
                          I - Wrong Interval
                          R - Remote Defect received
                          T - Timed Out
                          P - Peer port down

CCMs received: 2

```

show ethernet cfm peer meps

```

Out-of-sequence:          0
Remote Defect received:   2
Wrong Level:              0
Cross-connect (wrong MAID): 0
Wrong Interval:          2
Loop (our MAC received):  0
Config (our ID received): 0
Last CCM received 00:15:49 ago:
Level: 2, Version: 0, Interval: 10s
Sequence number: 1, MEP-ID: 600
MAID: DNS-like: dom5, String: ser5
Chassis ID: Local: ios; Management address: 'Not specified'
Port status: Up, Interface status: Down

```

Table 7: show ethernet cfm peer meps detail Field Descriptions

CFM state	<p>State of the peer MEP, how long it has been up or down, and whether the RDI bit was set in the last received CCM. The following possible states are shown if CCMs are currently being received:</p> <ul style="list-style-type: none"> • Missing • Timed out—No CCMs have been received for the loss time • Ok • Indication of a defect
Port state	<p>Port state of the peer, based on the Port Status and Interface Status TLVs. If no TLVs or CCMs have been received, this field is blank. Otherwise, the port status is displayed—unless it is Up. If the port status is Up, then the interface status is displayed.</p>

CCM defects detected	<p>Types of CCM defects that have been detected.</p> <p>The possible defects are:</p> <ul style="list-style-type: none"> • Remote Defect received—The last CCM received from the peer had the RDI bit set. • Loop (our MAC received)—CCMs were received from a peer with the same MAC address as the local MEP. • Config (our ID received)—CCMs were received from a peer with the same MEP ID as the local MEP. • Cross-connect (wrong MAID)—The last CCM received from the peer contained a domain/service identifier that did not match the locally configured domain/service identifier. • Peer port down—The last CCM received from the peer contained an Interface Status indicating that the interface on the peer was not up. • Wrong interval—The last CCM received contained a CCM interval that did not match the locally configured CCM interval. • Wrong level—The last CCM received was for a lower level than the level of the local MEP. • Timed out—No CCMs have been received within the loss time. • Missing (cross-check)—Cross-check is configured and lists this peer MEP, but no CCMs have been received within the loss time. • Unexpected (cross-check)—Cross check is configured for this service and does not list this peer MEP, but CCMs have been received from it within the loss time.
CCMs received	Number of CCMs received in total, by defect type.
Last CCM received	How long ago the last CCM was received, and a full decode of its contents. Any unknown TLVs are displayed in hexadecimal.
Offload status	Offload status of received CCM handling.

Related Commands

Command	Description
show ethernet cfm local maintenance-points	Displays a list of local maintenance points.
show ethernet cfm local meps	Displays information about local MEPs.

show ethernet cfm summary

To display summary information about CFM, use the **show ethernet cfm summary** command in the XR EXEC mode.

show ethernet cfm summary *location**node-id*

Syntax Description	location <i>node-id</i> (Optional) Specifies the location for which CFM summary is required. If the location is not specified, an overall summary for all nodes is displayed, followed by information for each node. If the location is specified, only information from that node is displayed.
---------------------------	---

Command Default	An overall summary for all nodes is displayed.
------------------------	--

Command Modes	XR EXEC mode
----------------------	--------------

Command History	Release	Modification
	Release 7.3.15	This command was introduced.

Usage Guidelines	No specific guidelines impact the use of this command.
-------------------------	--

Task ID	Task ID	Operation
	ethernet-services	read

Example

This example shows how to display ethernet CFM summary:

```
RP/0/RP0/CPU0:router# show ethernet cfm summary
```

```
CFM System Summary
```

```
=====
```

```

Domains                               4
Services                               10000
Local MEPS                             10000
  Operational                           9997
  Down MEPS                             9997
  Up MEPS                                0
  Offloaded                              200
    3.3ms                                100
    10ms                                  100
  Disabled (misconfiguration)            2
  Disabled (resource limit)              1
  Disabled (operational error)           0
Peer MEPS                               9997
  Operational                            9990
  Defect detected                         5
  No defect detected                     9985
  Timed out                              7
MIPs                                     0

```

```
Interfaces 10000
Bridge domains/Xconnects 10000
Traceroute Cache entries 3
Traceroute Cache replies 11
CCM Learning Database entries 10000
```

CFM Summary for 0/0/CPU0

=====

Initial resynchronization: complete

```
Domains 4
Services 10000
Local MEPS 1000
  Operational 999
  Down MEPS 999
  Up MEPS 0
  Offloaded 100
    3.3ms 100
    10ms 0
  Disabled (misconfiguration) 1
  Disabled (offload resource limit) 0
  Disabled (operational error) 0
Peer MEPS 999
  Operational 998
  Defect detected 2
  No defect detected 996
  Timed out 1
MIPs 0
Interfaces 1000
Bridge domains/Xconnects 10000
Traceroute Cache entries 1
Traceroute Cache replies 3
CCM Learning Database entries 1000
```

show ethernet cfm traceroute-cache

To display the contents of the traceroute cache, use the **show ethernet cfm traceroute-cache** command in XR EXEC mode.

```
{show ethernet cfm traceroute-cache [[domain domain-name] [service service-name] [local mep-id id] [transaction-id id]] | interface type interface-path-id [[domain domain-name] [transaction-id id]] [{exploratory | targeted}] [status {complete | incomplete}] [detail]}
```

Syntax Description	
domain <i>domain-name</i>	(Optional) Displays information about a CFM domain, where <i>domain-name</i> is a string of a maximum of 80 characters that identifies the domain in which the maintenance points reside.
service <i>service-name</i>	(Optional) Displays information about a CFM service, where <i>service-name</i> is a string of a maximum of 80 characters that identifies the maintenance association to which the maintenance points belong.
local mep-id <i>id</i>	(Optional) Displays information for the specified local maintenance end point (MEP). The range for MEP ID numbers is 1 to 8191.
transaction-id <i>id</i>	(Optional) Displays information for the specified transaction.
interface <i>type</i>	(Optional) Displays information about the specified interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	(Optional) Physical interface or virtual interface. Note Use the show interfaces command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.
exploratory	(Optional) Displays information for exploratory traceroutes.
targeted	(Optional) Displays information for traceroutes that are not exploratory, but explicitly mapped.
status	(Optional) Displays status information.
complete	(Optional) Displays status information for traceroutes that have received all replies.
incomplete	(Optional) Displays status information for traceroutes that are still receiving replies.
detail	(Optional) Displays detailed information.

Command Default Shows output for the default traceroute.

Command Modes XR EXEC mode

Command History	Release	Modification
	Release 7.3.15	This command was introduced.

Usage Guidelines Use the **show ethernet cfm traceroute-cache** command to display the contents of the traceroute cache; for example, to see the maintenance intermediate points (MIPs) and maintenance end points (MEPs) of a domain as they were discovered. The data is historic. The traceroute cache stores entries from previous traceroute operations.

In the output, the traceroutes sourced from each local MEP are listed. The heading for the local MEP contains the domain name and level, service name, MEP ID and interface name.

Task ID	Task ID	Operations
	ethernet-services	read

Examples

The following example shows sample output for the **show ethernet cfm traceroute-cache** command:

```
RP/0/RP0/CPU0:router# show ethernet cfm traceroute-cache
```

```
Traceroutes in domain bar (level 4), service bar
Source: MEP-ID 1, interface GigabitEthernet0/0/0/0
```

```
=====
Traceroute at 2009-05-18 12:09:10 to 0001.0203.0402,
TTL 64, Trans ID 2:
```

Hop	Hostname/Last	Ingress MAC/name	Egress MAC/Name	Relay
1	ios 0000-0001.0203.0400	0001.0203.0400 [Down] Gi0/0/0/0		FDB
2	abc ios		0001.0203.0401 [Ok] Not present	FDB
3	bcd abc	0001.0203.0402 [Ok] GigE0/0		Hit

Replies dropped: 0

```
Traceroutes in domain foo (level 2), service foo
Source: MEP-ID 1, interface GigabitEthernet0/0/0/0
```

```
=====
Traceroute at 2009-05-18 12:03:31 to 0001.0203.0403,
TTL 64, Trans ID 1:
```

Hop	Hostname/Last	Ingress MAC/name	Egress MAC/Name	Relay
1	abc 0000-0001.0203.0400	0001.0203.0401 [Ok] Not present		FDB
2	bob abc	0001.0203.0402 [Ok] Gi0/1/0/2.3		MPDB
3	cba bob		0001.0203.0403 [Ok] Gi0/2/0/3.45	Hit

Replies dropped: 0

```
Traceroute at 2009-05-18 12:15:47 to 0001.0203.0409,
TTL 64, Trans ID 3, automatic:
00:00:05 remaining
```

show ethernet cfm traceroute-cache

Traceroute at 2009-05-18 12:20:10 explore to ffff.ffff.ffff,
TTL 64, Trans ID 4, Timeout auto, Reply Filter Default:

Hop	Hostname/Last	Ingr/Egr	MAC/name	Relay
1	abc	Ingress	0015.0000.323f [Ok]	FDB
	0000-0001.0203.0400		Gi0/0/0/0.1	
2	abc	Egress	0015.0000.323e [Ok]	FDB
	abc		Te0/1/0/0.1	
3	0002-0016.eeee.1234	Ingress	0016.eeee.1234 [Ok]	FDB
	abc		Te0/4.23	
4	0000-0016.eeee.4321	Egress	0016.eeee.4321 [Ok]	FDB
	0002-0016.eeee.1234		Gi1/2.23	
5	rtr	Ingress	0015.0000.f123 [Ok]	FDB
	0002-00.16.eeee.4321		Gi0/0/0/0	
2	abc	Egress	0015.0000.323d [Ok]	FDB
	abc		Te0/1/0/1.1	
3	pe2	Ingress	0017.0000.cf01 [Ok]	FDB
	abc		Te0/0/2/0/1.450	
4	pe2	Egress	0017.0000.cf01 [Ok]	Drop
	pe2		Gi0/0/0/0.451	
4	pe2	Egress	0017.0000.cf01 [Ok]	FDB
	pe2		Gi0/0/0/1.452	
5	ce2	Ingress	0015.0000.8830 [Ok]	FDB
	pe2		Gi0/1/0/0	

Replies dropped: 0

Table 8: show ethernet cfm traceroute-cache Field Descriptions

Field	Description
Traceroute at	Date and time the traceroute was started.
to	Destination MAC address.
explore to	(Exploratory traceroutes) MAC address of the target for the exploratory traceroute.
TTL	Initial Time To Live used for the traceroute operation.
Trans ID	Transaction ID
Timeout	(Exploratory traceroutes) If no timeout was configured, "Timeout auto" is shown.
Reply Filter	(Exploratory traceroutes) Type of filter.
automatic	Indicates that the traceroute was triggered automatically (for example, as a result of a peer MEP exceeding the loss threshold, or if Continuity-Check Auto-traceroute is configured).
00:00:00 remaining	If the traceroute is in progress, the time remaining until it completes.
No replies received	Traceroute has completed but no replies were received.
Replies dropped	Number of replies dropped.
FDB only	Indicates FDB-only was configured for a standard traceroute.

Field	Description
Hop	Number of hops between the source MEP and the Maintenance Point that sent the reply. (Exploratory traceroutes) The display is indented by an extra character as the hop increases, so that the tree of responses can be seen.
Hostname/Last	On the first line, the hostname of the Maintenance Point that sent the reply. On the second line, the hostname of the previous Maintenance Point in the path. If either of the hostnames is unknown, the corresponding Egress ID is displayed instead.
Ingr/Egr	(Exploratory traceroutes) Indicates whether the reply is for an ingress or egress interface, but never both.
Ingress MAC/Name	If the reply includes information about the ingress interface, then the first line displays the ingress interface MAC address and the ingress action. The ingress interface name, if known, is displayed on the second line.
Egress MAC/Name	If the reply includes information about the egress interface, then the first line displays the egress interface MAC address and the egress action. The egress interface name, if known, is displayed on the second line.
MAC/Name	(Exploratory traceroutes) The MAC address of the interface from which the reply was sent, and the ingress/egress action, are displayed on the first line. If the interface name was present in the reply, it is displayed on the second line.
Relay	Type of relay action performed. For standard traceroutes, the possible values are: <ul style="list-style-type: none"> • Hit—The target MAC address was reached. • FDB—The target MAC address was found in the Filtering Database (the MAC learning table on the switch) and will be forwarded by the interface. • MPDB—The target MAC address was found in the MP Database (the CCM Learning database on the switch). In addition, “MEP” is displayed on the second line if a terminal MEP was reached. For exploratory traceroutes, the possible values are: <ul style="list-style-type: none"> • Hit—The target MAC address was reached. • FDB—The target MAC address was found in the Filtering Database and will be forwarded at this interface. • Flood—The target MAC address was not found in the Filtering database, and will be flooded at this interface. • Drop—The target MAC address will not be forwarded at this interface.

The following example shows sample output for the **show ethernet cfm traceroute-cache detail** command:

show ethernet cfm traceroute-cache

```
RP/0/RP0/CPU0:router# show ethernet cfm traceroute-cache domain bar detail
```

```
Traceroutes in domain bar (level 4), service bar
Source: MEP-ID 1, interface GigabitEthernet0/0/0/0
```

```
=====
Traceroute at 2009-05-18 12:09:10 to 0001.0203.0402,
TTL 64, Trans ID 2:
```

Hop	Hostname	Ingress MAC	Egress MAC	Relay
1	ios	0001.0203.0400 [Down]		FDB
	Level: 4, version: 0, Transaction ID: 2 TTL: 63, Relay Action: RlyFDB Forwarded, Terminal MEP not reached Last egress ID: 0000-0001.0203.0400 Next egress ID: 0000-0001.0203.0400 Ingress interface: Action: IngDown, MAC: 0001.0203.0400 ID: Local: Gi0/0/0/0 Hostname: Local: ios, address Not specified			
2	abc		0001.0203.0401 [Ok]	FDB
	Level: 4, version: 0, Transaction ID: 2 TTL: 62, Relay Action: RlyFDB Forwarded, Terminal MEP not reached Last egress ID: 0000-0001.0203.0400 Next egress ID: 0000-0001.0203.0401 Egress interface: Action: EgOk, MAC: 0001.0203.0401 ID: Not present Hostname: Local: abc, address Not specified			
3	bcd	0001.0203.0402 [Ok]		Hit
	Level: 4, version: 0, Transaction ID: 2 TTL: 61, Relay Action: RlyHit Not Forwarded, Terminal MEP not reached Last egress ID: 0000-0001.0203.0401 Next egress ID: Not Forwarded Ingress interface: Action: IngOk, MAC: 0001.0203.0402 ID: Local: GigE0/0 Hostname: Local: bcd, address Not specified			

```
Replies dropped: 0
```

```
Traceroute at 2009-05-18 12:30:10 explore to ffff.ffff.ffff from 0204.0608.0a0c,
TTL 255, Trans ID 5, Timeout auto, Reply Filter Spanning Tree:
```

Hop	Hostname	Ingr/Egr MAC	Relay
1	0000-0015.0000.ffff	Ingress 0015.0000.ffff [Ok]	FDB
	Level: 2, version: 0, Transaction ID: 5 TTL: 254, Relay Action: RlyFDB Forwarded, Terminal MEP not reached Next-Hop Timeout: 5 seconds Delay Model: Logarithmic Last egress ID: 0000-0002.0002.0002 Next egress ID: 0000-0015.0000.ffff Ingress interface: Action: ELRIngOk, MAC: 0015.0000.ffff ID: Local: Gi0/0/0/0.1		

```
2 0001-0030.0000.ffff          Egress  0030.0000.ffff [Ok]   Drop
  Level: 2, version: 0, Transaction ID: 5
  TTL: 253, Relay Action: RlyDrop
  Not Forwarded, Terminal MEP not reached
  Next-Hop Timeout: 5 seconds
  Delay Model: Logarithmic
  Last egress ID: 0000-0015.0000.ffffe
  Next egress ID: 0030-0000.0000.ffffd
  Egress interface:
    Action: ELREgrOk, MAC: 0030.0000.ffffd
    ID: Local: Gi0/1/0/1.2
```

Related Commands**Command****Description**

[clear ethernet cfm traceroute-cache](#)Removes the contents of the traceroute cache.

show ethernet oam summary

To display the summary of all the active OAM sessions across all the interfaces, use the **show ethernet oam summary** command in XR EXEC mode.

The summary output hides the fields for which the field count is zero (0).

show ethernet oam summary

Command Default	This command displays summary of all the active OAM sessions for all the interfaces.
------------------------	--

Command History	Release	Modification
	Release 5.2.1	This command was introduced.

Usage Guidelines	No specific guidelines impact the use of this command.
-------------------------	--

Task ID	Task ID	Operations
	ethernet-services	read

Examples

The following example shows how to display the summary for all the active OAM sessions across all the interfaces.

```
Router#show ethernet oam summary
Wed Apr 29 09:32:19.874 PDT
Link OAM System Summary
=====
Profiles:                               1
Interfaces:                              4
  Interface states
    Port down:                            4
    Passive wait:                          0
    Active send:                           0
    Operational:                           0
    Loopback mode:                         0
  Miswired connections:                   1
Events:                                   0
  Local:                                   0
    Symbol period:                         0
    Frame:                                  0
    Frame period:                          0
    Frame seconds:                         0
  Remote:                                  0
    Symbol period:                         0
    Frame:                                  0
    Frame period:                          0
    Frame seconds:                         0

Event Logs
=====
Local Action Taken:
  N/A - No action needed                   EFD - Interface brought down using EFD
  None - No action taken                   Err.D - Interface error-disabled
```

Logged - System logged

Interface	Time	Type	Loc'n	Action
Gi0/0/0/0	Wed Apr 29 08:56:54 PDT	Dying gasp	Local	Err.D
Gi0/0/0/0	Wed Apr 29 08:56:54 PDT	Link fault	Remote	Err.D
Gi0/0/0/1	Wed Apr 29 08:56:51 PDT	Dying gasp	Local	Err.D
Gi0/0/0/1	Wed Apr 29 08:56:51 PDT	Link fault	Remote	Err.D
Gi0/0/0/2	Wed Apr 29 08:56:50 PDT	Dying gasp	Local	Err.D
Gi0/0/0/2	Wed Apr 29 08:56:50 PDT	Dying gasp	Remote	Err.D
Gi0/0/0/3	Wed Apr 29 08:56:46 PDT	Dying gasp	Local	Err.D
Gi0/0/0/3	Wed Apr 29 08:56:46 PDT	Link fault	Remote	Err.D

■ show ethernet oam summary