



Enabling Ethernet Local Management Interface

First Published: June 19, 2006

Last Updated: February 7, 2011

Ethernet Local Management Interface (LMI) is an Ethernet layer operation, administration, and management (OAM) protocol. It provides information that enables autoconfiguration of customer edge (CE) devices and provides the status of Ethernet virtual connections (EVCs) for large Ethernet metropolitan-area networks (MANs) and WANs. Specifically, Ethernet LMI notifies a CE device of the operating state of an EVC and the time when an EVC is added or deleted. Ethernet LMI also communicates the attributes of an EVC and a user-network interface (UNI) to a CE device.

The advent of Ethernet as a MAN and WAN technology imposes a new set of OAM requirements on Ethernet's traditional operations, which were centered on enterprise networks only. The expansion of Ethernet technology into the domain of service providers, where networks are substantially larger and more complex than enterprise networks and the user-base is wider, makes operational management of link uptime crucial. More importantly, the timeliness in isolating and responding to a failure becomes mandatory for normal day-to-day operations, and OAM translates directly to the competitiveness of the service provider.

Finding Feature Information

Your software release may not support all the features documented in this module. For the latest feature information and caveats, see the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the [“Feature Information for Enabling Ethernet Local Management Interface”](#) section on page 8.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to <http://www.cisco.com/go/cfn>. An account on Cisco.com is not required.



Americas Headquarters:

Cisco Systems, Inc., 170 West Tasman Drive, San Jose, CA 95134-1706 USA

Contents

- [Prerequisites for Enabling Ethernet Local Management Interface, page 2](#)
- [Restrictions for Enabling Ethernet Local Management Interface, page 2](#)
- [Information About Enabling Ethernet Local Management Interface, page 2](#)
- [How to Enable Ethernet Local Management Interface, page 4](#)
- [Configuration Examples for Ethernet Local Management Interface, page 5](#)
- [Additional References, page 6](#)
- [Feature Information for Enabling Ethernet Local Management Interface, page 8](#)
- [Glossary, page 9](#)

Prerequisites for Enabling Ethernet Local Management Interface

Business Requirements

- Ethernet OAM such as connectivity fault management (CFM) must be implemented and operational on the service provider's network.

Restrictions for Enabling Ethernet Local Management Interface

- Ethernet LMI relies on Ethernet CFM for the status of an EVC, the remote UNI identifier associated with an EVC, and remote UNI status.
- Ethernet LMI CE is available only on routing ports on routing platforms. For information about Ethernet LMI PE functionality on switching platforms, see the "[Configuring Ethernet CFM and E-LMI](#)" chapter of the *Cisco ME 3400 Switch Software Configuration Guide*, Release 12.2(25)SEG.
- Ethernet LMI in the Cisco IOS Software Release 12.4(9)T does not support autoconfiguration of CE devices.

Information About Enabling Ethernet Local Management Interface

- [EVC, page 3](#)
- [Ethernet LMI, page 3](#)

EVC

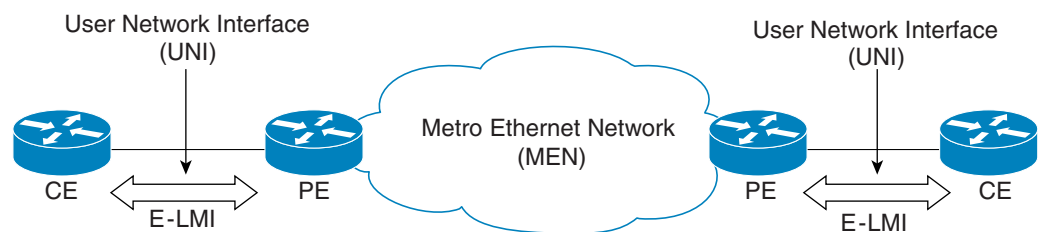
An EVC as defined by the Metro Ethernet Forum could be a port level point-to-point or multipoint-to-multipoint Layer 2 circuit. EVC status can be used by the CE device to find an alternative path in to the service provider network or in some cases, fall back to a backup path over Ethernet or another alternative service such as Frame Relay or ATM.

Ethernet LMI

Ethernet LMI is an Ethernet layer OAM protocol between a CE device and the PE in large Ethernet MANs and WANs. It provides information that enables service providers to autoconfigure CE devices with service parameters and parameter changes from a user provider edge (UPE) device.

Figure 1 shows where in a network Ethernet LMI functions.

Figure 1 Position in the Network Where Ethernet LMI Functions



E-LMI: Ethernet Provisioning and Management entity across UNI (CE-PE)

LMI also provides the status of Ethernet EVCs in large Ethernet MANs and WANs to the CE. Specifically, Ethernet LMI notifies a CE device of the operating state of an EVC and the time when an EVC is added or deleted. Ethernet LMI also communicates EVC and UNI attributes to a CE device.

The Ethernet LMI protocol includes the following procedures, as defined by the MEF 16 Technical Specification:

- Notifying the CE when an EVC is added
- Notifying the CE when an EVC is deleted
- Notifying the CE of the availability state of a configured EVC (Active, Not Active, or Partially Active)
- Communicating UNI and EVC attributes to the CE

Benefits of Ethernet LMI

- Communication of end-to-end status of the EVC to the CE device
- Communication of EVC and UNI attributes to a CE device
- Competitive advantage for service providers

How to Enable Ethernet Local Management Interface

- [Enabling Ethernet LMI on All Supported Interfaces, page 4](#)
- [Enabling Ethernet LMI on a Single Supported Interface, page 4](#)

Enabling Ethernet LMI on All Supported Interfaces

Perform this task to enable Ethernet LMI on all supported interfaces on a device.

SUMMARY STEPS

1. `enable`
2. `configure terminal`
3. `ethernet lmi global`
4. `end`

DETAILED STEPS

	Command or Action	Purpose
Step 1	<code>enable</code> Example: Router> <code>enable</code>	Enables privileged EXEC mode. <ul style="list-style-type: none">• Enter your password if prompted.
Step 2	<code>configure terminal</code> Example: Router# <code>configure terminal</code>	Puts the CLI in global configuration mode.
Step 3	<code>ethernet lmi global</code> Example: Router(config)# <code>ethernet lmi global</code>	Enables Ethernet LMI on all supported interfaces on the device.
Step 4	<code>end</code> Example: Router# <code>end</code>	Returns the CLI to privileged EXEC mode.

Enabling Ethernet LMI on a Single Supported Interface

Perform the steps in this task to enable Ethernet LMI on a specific supported interface.

SUMMARY STEPS

1. `enable`
2. `configure terminal`

3. **interface** *type number*
4. **ethernet lmi interface**
5. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Router> enable	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	configure terminal Example: Router# configure terminal	Puts the CLI in global configuration mode.
Step 3	interface <i>type number</i> Example: Router(config)# interface ethernet 0/0	Specifies an interface and puts the CLI in interface configuration mode.
Step 4	ethernet lmi interface Example: Router(config-if)# ethernet lmi interface	Enables Ethernet LMI on the interface.
Step 5	end Example: Router# end	Returns the CLI to privileged EXEC mode.

Configuration Examples for Ethernet Local Management Interface

The examples in this section show the configurations that enable Ethernet LMI on all interfaces on a CE device (globally) and on a specific interface on a CE device.

- [Example: Enabling Ethernet LMI on All Supported Interfaces, page 5](#)
- [Example: Enabling Ethernet LMI on a Single Supported Interface, page 6](#)

Example: Enabling Ethernet LMI on All Supported Interfaces

```
enable
configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
ethernet lmi global
end
00:06:33: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/0, changed p
```

Example: Enabling Ethernet LMI on a Single Supported Interface

```
enable
configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
interface ethernet 0/0
ethernet lmi interface
end
00:05:51: %SYS-5-CONFIG_I: Configured from console by console
```

Additional References

Related Documents

Related Topic	Document Title
Ethernet Connectivity Fault Management	“Configuring Ethernet Connectivity Fault Management in a Service Provider Network” in the <i>Cisco IOS Carrier Ethernet Configuration Guide</i>
Configuring CFM and E-LMI in a service provider network	Cisco ME 3400 Switch Software Configuration Guide, Rel. 12.2(25)SEG
Commands used for configuring Ethernet LMI in a service provider network	Cisco ME 3400 Switch Command Reference, Rel. 12.2(25)SEG
Ethernet LMI at a provider edge	“Configuring Ethernet Local Management Interface at a Provider Edge” in the <i>Cisco IOS Carrier Ethernet Configuration Guide</i>
Carrier Ethernet commands: complete command syntax, command mode, command history, defaults, usage guidelines, and examples	Cisco IOS Carrier Ethernet Command Reference
Cisco IOS commands: master list of commands with complete command syntax, command mode, command history, defaults, usage guidelines, and examples	Cisco IOS Master Command List, All Releases

Standards

Standard	Title
Metro Ethernet Forum 16 Technical Specification	Technical Specification MEF 16- Ethernet Local Management Interface
IEEE P802.1ag/D5.2	Draft Standard for Local and Metropolitan Area Networks
ITU-T Q.3/13	Liaison statement on Ethernet OAM (Y.17ethoam)
IETF VPLS OAM	L2VPN OAM Requirements and Framework

MIBs

MIB	MIBs Link
No new or modified MIBs are supported by this feature, and support for existing MIBs has not been modified by this feature.	To locate and download MIBs for selected platforms, Cisco software releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

RFCs

RFC	Title
No new or modified RFCs are supported by this feature, and support for existing RFCs has not been modified by this feature.	—

Technical Assistance

Description	Link
The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.	http://www.cisco.com/cisco/web/support/index.html

Feature Information for Enabling Ethernet Local Management Interface

Table 1 lists the feature release history for this feature.

Use Cisco Feature Navigator to find information about platform support and software image support. Cisco Feature Navigator enables you to determine which software images support a specific software release, feature set, or platform. To access Cisco Feature Navigator, go to <http://www.cisco.com/go/cfn>. An account on Cisco.com is not required.



Note

Table 1 lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Table 1 Feature Information for Enabling Ethernet Local Management Interface

Feature Name	Releases	Feature Information
Ethernet Local Management Interface	12.4(9)T 12.2(33)SRB 12.4(15)T2	<p>Ethernet LMI is an Ethernet layer OAM protocol. It provides information that enables autoconfiguration of CE devices and provides the status of EVCs for large Ethernet MANs and WANs.</p> <p>This feature was implemented on the Cisco 7600 router in Cisco IOS Release 12.2(33)SRB.</p> <p>The following commands were introduced or modified: clear ethernet lmi statistics, debug ethernet lmi, ethernet lmi, ethernet lmi global, ethernet lmi interface, show ethernet lmi.</p>

Glossary

CE—customer edge. Edge equipment on the customer side of a user-network interface (UNI).

CE-VLAN ID—Identifier of a CE-VLAN.

E-LMI—Ethernet Local Management Interface. An Ethernet layer OAM protocol. It provides information that enables autoconfiguration of CE devices and provides the status of Ethernet virtual connections (EVCs) for large Ethernet MANs and WANs.

EVC—Ethernet virtual connection. An association of two or more user-network interfaces.

OAM—operations, administration, and maintenance. A term used by several standards bodies to describe protocols and procedures for operating, administrating, and maintaining networks. Examples are ATM OAM and IEEE Std. 802.3ah OAM.

PE—provider edge. Edge equipment on the service provider side of a user-network interface (UNI).

UNI—user-network interface. A common term for the connection point between an operator's bridge and customer equipment. A UNI often includes a C-VLAN-aware bridge component. The term UNI is used broadly in the IEEE P802.1ag/D5.2 standard when the purpose for various features of LMI are explained.

Cisco and the Cisco Logo are trademarks of Cisco Systems, Inc. and/or its affiliates in the U.S. and other countries. A listing of Cisco's trademarks can be found at www.cisco.com/go/trademarks. Third party trademarks mentioned are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (1005R)

Any Internet Protocol (IP) addresses and phone numbers used in this document are not intended to be actual addresses and phone numbers. Any examples, command display output, network topology diagrams, and other figures included in the document are shown for illustrative purposes only. Any use of actual IP addresses or phone numbers in illustrative content is unintentional and coincidental.

© 2006–2011 Cisco Systems, Inc. All rights reserved.

