CHAPTER 48

Using Link Operations, Administration and Maintenance Operations Commands

Ethernet Operations, Administration, and Maintenance (E-OAM) consists of three main feature sets:

- IEEE 802.1ag and ITU-T Y.1731 Connectivity Fault Management (CFM).
- IEEE 802.3ah Ethernet OAM discovery, link monitoring, remote fault detection, and remote loopback.
- Ethernet Local Management Interface (Ethernet LMI), which allows a customer edge (CE) network element to obtain user network interface (UNI) and Ethernet virtual connection (EVC) status and service attribute information from the service provider edge.

The IOS OAM manager streamlines interaction between OAM protocols, and handles the interaction between CFM and Ethernet LMI. Ethernet LMI interaction with the OAM manager is unidirectional, running only from the OAM manager to Ethernet LMI on the U-PE side of the switch. Information is exchanged either as a result of a request from Ethernet LMI or triggered by the OAM manager when it receives notification of a change from the OAM protocol. The following type of information is relayed:

- EVC name and availability status
- Remote UNI name and status
- Remote UNI counts

Ethernet LMI is typically disabled by default.

Link (802.3AH) OAM (L-OAM) can be implemented on any full-duplex point-to-point or emulated point-to-point Ethernet link. The frames (OAM Protocol Data Units [OAMPDUs]) cannot propagate beyond a single hop within an Ethernet network and have modest bandwidth requirements (frame transmission rate is limited to a maximum of 10 frames per second). The major features covered by the L-OAM protocol are discovery, link monitoring, remote fault detection, and remote loopback.

Supported Network Elements

You can run the L-OAM commands on the following network elements:

- Cisco 7600 Series Routers
- Cisco Catalyst 3750 Metro Series Switches
- Cisco Catalyst 6500 Series (IOS) Switches
- Cisco ME 3400 Series Ethernet Access Switches
- Cisco MWR 2941 Mobile Wireless Routers

- Cisco ASR 9000 Series Aggregation Services Routers
- Cisco 2900 Series Integrated Services Routers
- Cisco 3900 Series Integrated Services Routers
- Cisco ME 3600X Ethernet Access Switches
- Cisco ME 3800X Carrier Ethernet Switch Routers

See Part 1—Cisco VNEs for details on the software versions Cisco ANA supports for these network elements. To run the L-OAM commands, the software on the network element must support the L-OAM technology.

Configuring L-OAM Components

The following sections explain how to configure L-OAM components:

Note In the GUI, parameters that are displayed in bold text are mandatory.

Applying a Template on an Interface

Use the **Apply Template on Interface** command to apply a template on an interface.

Step 1 In the inventory window, expand the Logical Inventory tree.

Step 2 Right-click the OAM node and choose **Commands > Apply Template on Interface**. The Apply Template on Interface dialog box opens.

Step 3 By default, the General tab is selected. Enter values for the following parameters.

Input Parameter	Description
Interface Name	Name of the interface.
Template Name	Name of the template.

Step 4 To see the commands that will be applied on the device, click **Preview**.

You can view the commands in the Result tab. You can go back and make any required changes to the input parameters.

Step 5 To run the commands, click **Execute**.

Any errors are displayed in the Result tab.

Step 6 To close the dialog box, click **Close**.

Creating a Template

Use the **Create Template** command to create a template.

Step 1 In the inventory window, expand the Logical Inventory tree.

Step 2 Right-click the OAM node and choose **Commands > Create Template**. The Create Template dialog box opens.

Step 3 By default, the General tab is selected. Enter values for the following parameters.

Input Parameter	Description
Template Name	Name of the template.
Symbol-Period Threshold Low	The range is from 0 to 65535. The low threshold value must be lower than the high threshold.
Symbol-Period Threshold High	The range is from 1 to 65535. You can also enter none as an option.
Frame Window	The range is from 10 to 600, which represents milliseconds in multiples of 100. The default is 100.
Frame Threshold Low	The range is from 0 to 65535. The low threshold value must be lower than the high threshold.
Frame Threshold High	The range is from 1 to 65535. You can also enter none as an option.
Frame-Period Window	The range is from 1 to 65535, which represents multiples of 10000 frames. The default is 1000.
Frame-Period Threshold Low	The range is from 0 to 65535. The default is 1.
Frame-Period Threshold High	The range is from 1 to 65535. You can also enter none as an option.
Frame-Seconds Window	The range is from 100 to 9000, which represents a multiple of 100 milliseconds. The default is 1000.
Frame-Seconds Threshold Low	The range is from 1 to 900. The default is 1.
Frame-Seconds Threshold High	The range is from 1 to 900. You can also enter none as an option.
Receive-Crc Window	The range is from 10 to 1800, which represents milliseconds in multiples of 100. The default is 100.
Receive-Crc Threshold High	The range is from 1 to 65535. You can also enter none as an option.
Transmit-Crc Window	The range is from 10 to 1800.
Transmit-Crc Threshold High	The range is from 1 to 65535. You can also enter none as an option.

Step 4 To see the commands that will be applied on the device, click **Preview**.

You can view the commands in the Result tab. You can go back and make any required changes to the input parameters.

Step 5 To run the commands, click **Execute**.

Any errors are displayed in the Result tab.

Step 6 To close the dialog box, click **Close**.

Disabling OAM on an Interface

Use the **Disable OAM on Interface** command to disable L-OAM on an interface.

Step 1 In the inventory window, expand the Logical Inventory tree.

Step 2 Right-click the OAM node and choose **Commands > Disable OAM on Interface**. The Disable OAM on Interface dialog box opens.

Step 3 By default, the General tab is selected. Enter a value for the following parameter.

Input Parameter	Description
Interface Name	Name of the interface.

Step 4 To see the commands that will be applied on the device, click **Preview**.

You can view the commands in the Result tab. You can go back and make any required changes to the input parameters.

Step 5 To run the commands, click **Execute**.

Any errors are displayed in the Result tab.

Step 6 To close the dialog box, click **Close**.

Enabling OAM on an Interface

Use the **Enable OAM on Interface** command to enable L-OAM on an interface.

Step 1 In the inventory window, expand the Logical Inventory tree.

Step 2 Right-click the OAM node and choose **Commands > Enable OAM on Interface**. The Enable OAM on Interface dialog box opens.

Step 3 By default, the General tab is selected. Enter a value for the following parameter.

Input Parameter	Description
Interface Name	Name of the interface.

Step 4 To see the commands that will be applied on the device, click **Preview**.

You can view the commands in the Result tab. You can go back and make any required changes to the input parameters.

Step 5 To run the commands, click **Execute**.

Any errors are displayed in the Result tab.

Step 6 To close the dialog box, click **Close**.

Configuring OAM Parameters on an Interface

Use the **Configure OAM Parameter on Interface** command to configure L-OAM parameters on an interface.

Step 1 In the inventory window, expand the Logical Inventory tree.

Step 2 Right-click the OAM node and choose **Commands > Configure OAM Parameter on Interface**. The Configure OAM Parameter on Interface dialog box opens.

Step 3 By default, the General tab is selected. Enter values for the following parameters.

Input Parameter	Description
Interface Name	Name of the interface.
Max-Rate	Maximum number of OAM PDUs sent per second. The range is from 1 to 10.
Min-Rate	Minimum transmission rate, in seconds, when one OAM PDU is sent per second. The range is from 1 to 10.
Mode	Sets the OAM client mode to active or passive.
Remote Loopback	Enables or disables Ethernet remote loopback on the interface.
Time Out	Timeout range, from 2 to 30.

Step 4 To see the commands that will be applied on the device, click **Preview**.

You can view the commands in the Result tab. You can go back and make any required changes to the input parameters.

Step 5 To run the commands, click **Execute**.

Any errors are displayed in the Result tab.

Step 6 To close the dialog box, click **Close**.

Starting the Remote Loopback

Use the **Start Remote Loopback** command to turn on Link OAM remote loopback on an interface.

Step 1 In the inventory window, expand the Logical Inventory tree.

Step 2 Right-click the OAM node and choose **Commands > Start Remote Loopback**.

The Start Remote Loopback dialog box opens.

Step 3 By default, the General tab is selected. Enter values for the following parameters.

Input Parameter	Description
Interface Name	Name of the interface.

Step 4 To see the commands that will be applied on the device, click **Preview**.

You can view the commands in the Result tab. You can go back and make any required changes to the input parameters.

Step 5 To run the commands, click **Execute**.

Any errors are displayed in the Result tab.

Step 6 To close the dialog box, click **Close**.

Stopping the Remote Loopback

Use the **Stop Remote Loopback** command to turn off Link OAM remote loopback on an interface.

Step 1 In the inventory window, expand the Logical Inventory tree.

Step 2 Right-click the OAM node and choose **Commands > Stop Remote Loopback**.

The Stop Remote Loopback dialog box opens.

Step 3 By default, the General tab is selected. Enter values for the following parameters.

Input Parameter	Description
Interface Name	Name of the interface.

Step 4 To see the commands that will be applied on the device, click **Preview**.

You can view the commands in the Result tab. You can go back and make any required changes to the input parameters.

Step 5 To run the commands, click **Execute**.

Any errors are displayed in the Result tab.

Step 6 To close the dialog box, click **Close**.