



# Viewing Ethernet Operations, Administration, and Maintenance Tool Properties

The following topics describe how you can use Cisco Prime Network Vision (Prime Network Vision) to monitor Ethernet operations, administration, and maintenance (OAM) tools:

- User Roles Required to View Ethernet OAM Tool Properties, page 15-1
- Ethernet OAM Overview, page 15-2
- Viewing Connectivity Fault Management Properties, page 15-3
- Viewing Ethernet LMI Properties, page 15-9
- Viewing Link OAM Properties, page 15-13

## **User Roles Required to View Ethernet OAM Tool Properties**

This topic identifies the roles that are required to view Ethernet OAM tool properties. Prime Network determines whether you are authorized to perform a task as follows:

- For GUI-based tasks (tasks that do not affect elements), authorization is based on the default permission that is assigned to your user account.
- For element-based tasks (tasks that do affect elements), authorization is based on the default permission that is assigned to your account. That is, whether the element is in one of your assigned scopes and whether you meet the minimum security level for that scope.

For more information on user authorization, see the Cisco Prime Network 3.8 Administrator Guide.

The following tables identify the tasks that you can perform:

- Table 15-1 identifies the tasks that you can perform if a selected element **is not in** one of your assigned scopes.
- Table 15-2 identifies the tasks that you can perform if a selected element **is in** one of your assigned scopes.

By default, users with the Administrator role have access to all managed elements. To change the Administrator user scope, see the topic on device scopes in the *Cisco Prime Network 3.8 Administrator Guide*.

Γ

Task	Viewer	Operator	OperatorPlus	Configurator	Administrator
View CFM properties		_	—		X
View Ethernet LMI properties	_				Х
View Link OAM properties	_		—	—	X

 Table 15-1
 Default Permission/Security Level Required for Viewing Ethernet OAM Tool

 Properties - Element Not in User's Scope

 Table 15-2
 Default Permission/Security Level Required for Viewing Ethernet OAM Tool

 Properties - Element in User's Scope

Task	Viewer	Operator	OperatorPlus	Configurator	Administrator
View CFM properties	X	Х	X	X	X
View Ethernet LMI properties	X	X	X	Х	X
View Link OAM properties	X	X	X	X	X

#### **Related Topics**

- User Roles Required to View Ethernet OAM Tool Properties, page 15-1
- Viewing Connectivity Fault Management Properties, page 15-3
- Viewing Ethernet LMI Properties, page 15-9
- Viewing Link OAM Properties, page 15-13

### **Ethernet OAM Overview**

Prime Network Vision supports three, interrelated OAM components, including:

- Connectivity Fault Management—Connectivity Fault Management (CFM) is an end-to-end per-service-instance (per VLAN) Ethernet layer OAM protocol that includes connectivity monitoring, fault verification, and fault isolation. CFM allows you to manage individual customer service instances. Ethernet Virtual Connections (EVCs) are the services that are sold to customers and are designated by service VLAN tags. CFM operates on a per-service-VLAN (or per-EVC) basis. It lets you know when an EVC fails and provides tools to isolate the failure.
- Ethernet Local Management Interface—Ethernet Local Management Interface (Ethernet LMI) operates between the customer edge (CE) and the user-facing provider edge (U-PE) devices. Ethernet LMI allows you to automatically provision CEs based on EVCs and bandwidth profiles.
- Link OAM—Link OAM allows you to monitor and troubleshoot a single Ethernet link. It is an optional sublayer implemented in the Data Link Layer between the Logical Link Control (LLC) and MAC sublayers of the Open Systems Interconnect (OSI) model. You can monitor a link for critical events and, if needed, put a remote device into loopback mode for link testing. Link OAM also discovers unidirectional links, which are created when one transmission direction fails.

#### **Related Topics**

- User Roles Required to View Ethernet OAM Tool Properties, page 15-1
- Viewing Connectivity Fault Management Properties, page 15-3
- Viewing Ethernet LMI Properties, page 15-9
- Viewing Link OAM Properties, page 15-13

## **Viewing Connectivity Fault Management Properties**

CFM provides capabilities for detecting, verifying, and isolating connectivity failures in networks with bridges operated by multiple independent organizations, each with restricted management access to each other's equipment. CFM allows you to discover and verify end-to-end, Carrier Ethernet PE-to-PE or CE-to-CE paths through bridges and LANs.

CFM consists of maintenance domains. Maintenance domains are administrative regions used to manage and administer specific network segments. Maintenance domains are organized in a hierarchy. The administrator assigns a maintenance level to the domain from 0 (lowest level) to 7 (highest level); the maintenance level determines the domain's position within the CFM hierarchy.

CFM maintenance domain boundaries are indicated by maintenance points. A maintenance point is an interface point that participates within a CFM maintenance domain. Maintenance point types include:

- Maintenance Endpoints—Maintenance endpoints (MEPs) are active CFM elements residing at the edge of a domain. MEPs can be inward or outward facing. They periodically transmit continuity check messages and expect to periodically receive similar messages from other MEPs within a domain. If requested, MEPs can also transmit traceroute and loopback messages. MEPs are responsible for keeping CFM messages within the boundaries of a maintenance domain.
- Maintenance Intermediate Points—Maintenance intermediate points (MIPs) are passive elements that catalog information received from MEPs and other MIPs. MIPs only respond to specific CFM messages such as traceroute and loopback, and they forward those messages within the maintenance domain.



Prime Network Vision does not display information for CFM maintenance endpoints or maintenance intermediate points for Cisco Viking devices if errors exist in their configurations. An error in the configuration is indicated by an exclamation point (!) in the CLI output.

For example, if you enter the command **show ethernet cfm local maintenance-points**, a configuration error is indicated as follows:

cfm_d100/2	cfm_s100	Te0/2/0/3.100	Up MEP 2100 eb:7a:53!
------------	----------	---------------	-----------------------

L

To view CFM properties:

- **Step 1** In Prime Network Vision, double-click the required device for CFM.
- **Step 2** In the inventory window, choose **Logical Inventory > CFM**.

Figure 15-1 shows an example of CFM in logical inventory.

Figure 15-1 CFM in Logical Inventory

C4-upe8 [1N]	_ 0	I X
	Poll Now Cache Size:     0 Hold Time:     100 Maximum Cache Size:     100 Cfm Version:     IEEE D8.1  Maintenance Domains Maintenance Intermediate Points	
MD: User_Service1 Cisco Discovery Protocol	Find:	
Cisco Discovery Protocol Ethernet Link Aggregation Ethernet LMI IP SLA Responder Link Layer Discovery Protocol Operating System Resilent Ethernet Protocol	Name € ∠         Level         ID           DDDD         3         3	
Link Layer Discovery Protocol	Oper_Service1         4           User_Service1         7	
Operating System     Resilient Ethernet Protocol     Routing Entities     Spanning Tree Protocol     Physical Inventory		
C Device Zoom Best Ft	Line 0 (Size 3	3)
Tickets Network Events Provisioning Events	Memory: 10% Connected	

Table 15-3 describes the information displayed for CFM.

Field	Description			
Cache Size	CFM traceroute cache size in number of lines.			
Hold Time	Configured hold time (in minutes) that is used to indicate to the receiver the validity of traceroute and loopback messages transmitted by the device. The default value is 2.5 times the transmit interval.			
Maximum Cache Size	Maximum CFM traceroute cache size in number of lines.			
CFM Version	CFM version, such as IEEE D8.1.			
Maintenance Domains Tab	le			
Name	Domain name.			
Level	Unique level the domain is managed on. Values range from 0 to 7.			
ID	Optional domain identifier.			

Step 3 Click the Maintenance Intermediate Points tab to view MIP information. See Figure 15-2.

🖅 🐨 c2-core1 [2M]		Poll Now						
Logical Inventory [1M]     Access Lists     ATM Traffic Profiles		Cfm Version:	IEEE D8.1					
ATM Traffic Profiles ATM Traffic Profiles Bridges CFM MD: D2 M0: 5250								
▼ end CFM ▼ end CFM ▼ end CFM ■ MD: D2		Maintenance Do	mains Maintenance	Intermediate Points				
N12 11W1 0200		Find :	<b>₫</b> 2↓	マキ軍隊				
MA: 5252		Interface 👌	L	MAC Address	InnerVLANs	VLANs	Auto Created	Level
MA: 5256		c2-core1#1.30	SigabitEthernet1/3/1	00 1D 71 98 EE C3		[250-270]	false	3
MA: 5258		c2-core1#2.3:0	SigabitEthernet2/3/1	00 1D 71 98 EE C3		[250-270]	false	3
Device Zoom								Line 0 (Size 2)
Find : 🚺 🛃 🦷	7 🖤	調整						
e a lecture la combé co	<b>.</b>		No is is	n	· •	e - e		1 m 10 m
Tickets Network Events Provisionin	g Event	ts						

Figure 15-2 CFM Maintenance Intermediate Points Tab

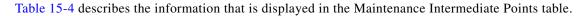


 Table 15-4
 CFM Maintenance Intermediate Point Properties

Field	Description			
Interface	Interface configured as a MIP, hyperlinked to its entry in physical inventory.			
MAC Address	MAC address of the interface.			
Inner VLANs	Inner VLAN identifiers.			
VLANs	VLANs associated with the interface.			
Auto Created	Whether or not the MIP was automatically created: True or False.			
Level	Unique level the domain is managed on. Values range from 0 to 7.			

**Step 4** To view the details of a specific maintenance domain, do one of the following:

- Choose Logical Inventory > CFM > domain.
- Double-click the required entry in the Maintenance Domains table.

Figure 15-3 shows an example of the information displayed for the maintenance domain.

C2-core1 [2M]     Logical Inventory [IM]     Access Lists     Art Traffic Profiles     Bridges     Bridges     CFM	A Poll Nov Maintenanc		Level:	2					
🔻 🛃 MD: D2	Maintenan	e Associations							
MA: 5250	Find :		<b>ۇ</b> ↓ 🖓 🎙						
MA: 5254	Name 🕹 /	Association Type	Direction	Continuity Check	Continuity Check Interval	Associated Entity	Cross Check	Maximum MEPs	Inner V
▶ ∰ MA: 5256 ▶ ∰ MA: 5258 ▶ ∰ MA: 5260 ▶ ∰ MA: 5262	\$250	Unknown	Up	true	10.0 sec	c2-core1 (250) VLAN0250	false	100	
MA: 5258 MA: 5260	5252	Unknown	Up	true	10.0 sec	c2-core1 (252) VLAN0252	false	100	
MA: 5260	S254	Unknown	Up	true	10.0 sec	c2-core1 (254) VLAN0254	false	100	
MA: 5264	\$256	Unknown	Up	true	10.0 sec	c2-core1 (256) VLAN0256	false	100	
MA: 5266	5258	Unknown	Up	true	10.0 sec	c2-core1 (258) VLAN0258	false	100	
MA: 5200	5260	Unknown	Up	true	10.0 sec	c2-core1 (260) VLAN0260	false	100	
MD: D3	5262	Unknown	Up	true	10.0 sec	c2-core1 (262) VLAN0262	false	100	
Cisco Discovery Protocol	5264	Unknown	Up	true	10.0 sec	c2-core1 (264) VLAN0264	false	100	
Ethernet Link Aggregation Ethernet LMI	5266	Unknown	Up	true	10.0 sec	c2-core1 (266) VLAN0266	false	100	
Cisco Discovery Protocol Ethernet Link Aggregation Ethernet MI Frame Relay Traffic Profiles 5-15	5268	Unknown	Up	true	10.0 sec	c2-core1 (268) VLAN0268	false	100	
IS-IS	▼ 5270	Unknown	Up	true	10.0 sec	c2-core1 (270) VLAN0270	false	100	
Device Zoom								1	Line 0 (Si
	5								
rickets Network Events Provisioning Events	-	5 IF IT		- · ··	1				

Figure 15-3	CFM Maintenance L	Domain Properties
-------------	-------------------	-------------------

Table 15-5 describes the information that is displayed for CFM maintenance domains.

Field	Description
Maintenance Domain Name	Name of the domain.
Level	Level at which the domain is managed: 0-7.
ID	Optional maintenance domain identifier.
Maintenance Associations Table	) }
Name	Name of the maintenance association.
Association Type	Maintenance association type.
Direction	Direction of the maintenance association: Up or Down.
Continuity Check	Whether or not the continuity check is enabled: True or False.
Continuity Check Interval	Interval (in seconds) for checking continuity.
Associated Entity	Bridge, port, or pseudowire that the maintenance association uses for CFM. Click the hyperlinked entry to view the item in inventory.
Cross Check	Whether or not cross checking is enabled: True or False.
Maximum MEPs	Maximum number of maintenance endpoints (MEPs) that can be configured on the maintenance association.
Inner VLAN	Inner VLAN identifier.

Step 5

To view the properties for a maintenance association's endpoints, do one of the following:

- Choose **Logical Inventory** > **CFM** > *domain* > *association*.
- In the Maintenance Associations table, double-click the required association.

Figure 15-4 shows the information displayed for the maintenance association endpoints.

\_ 🗆 × V c2-core1 [2M] Poll Now - 🖅 c2-core1 [2M] Logical Inventory [1M] 1 Maintenance Association Name: 5250 Association Type: Unknow Access Lists ATM Traffic Profiles Direction: Up Continuity Check: true Bridges Continuity Check Interval: 10.0 sec Cross Check: false CFM MD: D2 2 c2-core1 (250) VLAN0250 Associated Entity: 100 Maximum MEPs: 臣 MA: S250 15 MA: 5252 市市市市 MA: S254 MA: 5256 Maintenance End Points Remote Maintenance End Points MA: 5258 MA: 5260 MA: 5262 Find : 目会マキ幕章 ID 🕹 MAC Address Interface Continuity Check Status Direction MA: 5264 00 1D 71 98 EE C3 c2-core1#1.3:GigabitEthernet1/3/1 1250 MEP enabled MA: 5266 Up MA: 5268 3250 00 1D 71 98 EE C3 c2-core1#2.3:GigabitEthernet2/3/1 MEP enabled Up 虛 MA: S270 5 MD: D3 Cisco Discovery Protocol Ethernet Link Aggregation Ethernet LMI Frame Relay Traffic Profiles IS-IS Q Device Zoom 💽 Best Fit Line 0 (Size 2) 별 삶 ▽ 박 류 투 Find : ets Network Events Provisioning Events 310711 Memory: 22% Connected

Figure 15-4 CFM Maintenance Association - Endpoint Properties

Table 15-6 describes the information that is displayed for CFM maintenance associations and MIPs.

Table 15-6 CFM Maintenance Association Properties

Field	Description
Maintenance Association Name	Name of the maintenance association.
Association Type	Maintenance association type, such as Bridge Domain.
Direction	Direction of the maintenance association: Up or Down.
Continuity Check	Whether or not the continuity check is enabled: True or False.
Continuity Check Interval	Interval (in seconds) for checking continuity.
Cross Check	Whether or not cross checking is enabled: True or False.
Associated Entity	Bridge that the maintenance association uses for CFM. Click the hyperlinked entry to view the bridge in logical inventory.
Maximum MEPs	Maximum number of MEPs that can be configured on the maintenance association.
Inner VLANs	Inner VLAN identifiers.

Γ

Field	Description		
Maintenance End Points Table			
ID	Local identifier for the MEP.		
MAC Address	MAC address that identifies the MEP.		
Interface	Interface on which the MEP is configured, hyperlinked to the respective EFP, VSI or interface in inventory.		
Continuity Check Status	CFM continuity check status: MEP Active, MEP Inactive, MEP Enabled, MEP Disabled, or Unknown.		
Direction	Direction of traffic on which the MEP is defined: Up, Down, or Unknown.		

#### Table 15-6 CFM Maintenance Association Properties (continued)

- **Step 6** Click the **Remote Maintenance End Points** tab to view the information displayed for remote MEPs. See Figure 15-5.
  - Figure 15-5 Remote Maintenance End Points Table

<b>V</b> c2-core1 [2M]									_ 0	×
▼ 🖅 🖤 c2-core1 [2M]	*	😨 Poll N	ow							
▼ ♥ Logical Inventory [1M]										
		Maintena	nce Assoc	iation Name:	5250		Association *	Type: Unknown		
ATM Traffic Profiles		Direction			Up		Continuity C	heck: <b>true</b>		
Bridges										
🕶 🔤 CFM		Continuit	y Check Ir	nterval:	10.0 sec		Cross Check	false		
Access Lists ATM Traffic Profiles Bridges CFM MD: D2		Associate	ed Entity:		c2-core1 (250	) VLAN0250	Maximum MB	Ps: 100		
▶ MA: 5250										
MA: 5252										
MA: 5254		_					*****			-
MA: 5256		Mainten	ance End I	Points Rem	ote Maintenance (	End Points				_
▶         MA: 5250           ▶         MA: 5252           ↓         MA: 5254           ↓         MA: 5256           ↓         MA: 5256           ↓         MA: 5260           ↓         MA: 5260           ↓         MA: 5260           ↓         MA: 5260           ↓         MA: 5266           ↓         MA: 5268		Find :		Į,	2 🖓 🔻					
MA: 5262		MEP ID	ŧ٨	Level	Status		Address	Local MEP ID		
MA: 5266	U	2250		2	MEP active	00 24	50 E4 4C 00			
MA: 5268		2350		2	MEP active	00.21	56 3F 73 00			
		2450		2	MEP active		C3 C6 7E 80			
MD: D3		2100		2	PIET GEGYE	00 2 1	00 00 72 00			
Cisco Discovery Protocol										
Ethernet Link Aggregation										
Frame Relay Traffic Profiles										
Cisco Discovery Protocol Ethernet Link Aggregation Ethernet LMI Frame Relay Traffic Profiles JS-15	-									
🔍 Device Zoom 🔝 Best Fit										
1										
		4							•	•
	Ĥ								Line 0 (Size 3)	L
•					*****					
Find :	÷.									
					-					-
Tickets Network Events Provisioning Ev	ents	;								_
								Memory: 11%	Connected	
					1					£

Table 15-7 describes the information presented for remote MEPs.

Field	Description				
MEP ID	Remote MEP identifier.				
Level	Level at which the remote MEP is managed: 0-7.				
Status	Status of the remote MEP, such as MEP Active.				
MAC Address	MAC address of the remote MEP.				
Local MEP ID	Numeric identifier assigned to the local MEP. Values range from 1 to 8191.				
	<b>Note</b> If the remote MEP is in Up mode, the remote MEP is not associated to the local MEP. As a result, the Local MEP ID column is empty.				

#### Table 15-7 CFM Remote Maintenance End Points Table

#### **Related Topics**

- Ethernet OAM Overview, page 15-2
- Viewing Ethernet LMI Properties, page 15-9
- Viewing Link OAM Properties, page 15-13

## **Viewing Ethernet LMI Properties**

Ethernet Local Management Interface (LMI) is a protocol that operates between the customer edge (CE) network element and the provider edge (PE) network element.

Ethernet LMI:

- Runs only on the PE-CE User Network Interface (UNI) link.
- Notifies the CE of connectivity status and configuration parameters of Ethernet services available on the CE port.

Ethernet LMI interoperates with CFM, another OAM protocol that runs within the provider network, to collect OAM status. CFM runs at the provider maintenance level with inward-facing MEPs at the UNI. Using the OAM Ethernet infrastructure, Ethernet LMI works with CFM to provide end-to-end status of Ethernet virtual connections (EVCs) across CFM domains.

To view Ethernet LMI properties:

Step 1 In Prime Network Vision, double-click the device configured for Ethernet LMI.

Step 2 In the inventory window, choose Logical Inventory > Ethernet LMI.

Figure 15-6 shows an example of Ethernet LMI properties in logical inventory.

	pe1-76 [1M] ogical Inventory Access Lists ATM Traffic Profiles Bidirectional Forwarding Detection	Mode: Unk	<b>:nown</b> ELMI B	Enabled State:	Unknown			
►	Bridges							
	CFM Cisco Discovery Protocol	Device EVCs	ELMI Interfac	es				
	Clock	Find :		🖬 🛃 🗸	や 眉 辱			
	Ethernet Link Aggregation	EVC Name	EVC Type	EVC Status	Maintenance Association	Active Remote UNI Count	Configured Remote UNI Count	÷.
	Ethernet LMI Frame Relay Traffic Profiles	4_0_1_401	PointToPoint	NotDefined		0	1	
▶	IS-IS	4 0 1 402	PointToPoint	NotDefined		0	1	
	Local Switching	4_0_1_403	PointToPoint	NotDefined		0	1	
► ►	LSEs MPBGPs	4_0_1_404	PointToPoint	NotDefined		0	1	U
	OAM	4_0_1_405	PointToPoint	NotDefined		0	1	
•	Operating System	4_0_1_406	PointToPoint	NotDefined		0	1	
► <b></b>	OSPF Processes	4_0_1_407	PointToPoint	NotDefined		0	1	
-	Pseudowires Routing Entities	4_0_1_409	PointToPoint	NotDefined		0	1	
-	Routing Entity	4_0_1_411	PointToPoint	NotDefined		0	1	
	ARP Entity	4_0_1_415	PointToPoint	NotDefined		0	1	
•	Spanning Tree Protocol	4_0_1_416	PointToPoint	NotDefined		0	1	
Device Zoom	Best Fit	4_0_1_417	PointToPoint	NotDefined		0	1	
1.	1	4 0 1 418	PointToPoint	NotDefined		0	1	
			DeinkToDoint	NotDefined		0	1	-
							Line	e 0 (Size 58)
nd :		5 B						
					<b>D</b> 111			-
verity Ticke	t ID Last Modification Time 🗧	Root	Root Event Time		Description Lo	cation Acknowledged	Creation Time	Eve
kets Netv	work Events Provisioning Events							

Figure 15-6 Ethernet LMI in Logical Inventory

Table 15-8 describes the information displayed for Ethernet LMI.

 Table 15-8
 Ethernet LMI Properties in Logical Inventory

Field	Description				
Globally Enabled	Whether or not Ethernet LMI is enabled globally: True or False.				
Mode	Ethernet LMI mode: CE or PE.				
Device EVCs Tab					
EVC Name	Name of the EVC.				
EVC Type	Type of EVC: Point-to-point or Multipoint.				
EVC Status	EVC status: Active, Inactive, Not Defined, or Partially Active.				
Maintenance Association	Hyperlinked entry to the maintenance association in CFM in logical inventory. For more information about maintenance associations, see Table 15-6.				
Active Remote UNI Count	Number of active remote UNIs.				
Configured Remote UNI Count	Number of configured remote UNIs.				

Field	Description			
ELMI Interfaces Tab				
Interface Name	Hyperlinked entry to the interface in physical inventory. For more information, see Step 4 in this procedure.			
T391	Frequency at which the customer equipment sends status inquiries. The range is 5-30 seconds, with a default of 10 seconds.			
T392	Frequency at which the metro Ethernet network verifies that status enquiries have been received. The range is 5-30 seconds, with a default of 15 seconds. A value of 0 (zero) indicates the timer is disabled.			
N391	Frequency at which the customer equipment polls the status of the UNI and all EVCs. The range is 1-65000 seconds, with a default of 360 seconds.			
N393	Error count for the metro Ethernet network. The range is 1-10, with a default of 4.			

#### Table 15-8 Ethernet LMI Properties in Logical Inventory (continued)

Step 3 To view device EVC properties, double-click an EVC name in the Device EVCs tab.The Device EVC Properties window is displayed as shown in Figure 15-7.

Figure 15-7 Device EVC Properties Window

EVC Name:	VEIT	T_EVC EVC Type:	Point	tToPoint		
VC Status:	Inad	ctive Active Rem	note UNI Count: 0			
Configured Remote	UNI Count: 1					
NI Interfaces						
ind :	🖬 🛃	マキ軍隊				
NI Id 🕹 🗸	UNI Status	LMI Link Status	Interface Name	Is UNI Local	Local Interface	VLAN List
	Up		FastEthernet1/0/1	true	c1-upe3#0:FastEthernet1/0/1	

Table 15-9 describes the information displayed in the Device EVC Properties window.

Field	Description
EVC Name	Name of the EVC.
EVC Type	Type of EVC: Point-to-point or Multipoint.
EVC Status	EVC status: Active, Inactive, Not Defined, or Partially Active.
Maintenance Association	Hyperlinked entry to the maintenance association in CFM in logical inventory. For more information about maintenance associations, see Table 15-6.
Active Remote UNI Count	Number of active remote UNIs.
Configured Remote UNI Count	Number of configured remote UNIs.
UNI Interfaces Table	
UNI Id	UNI identifier.
UNI Status	Status of the UNI: Up or Down.
LMI Link Status	Status of the LMI link: Up or Down.
Interface Name	Interface on which UNI is configured.
Is UNI Local	Whether or not UNI is local: True or False.
Local Interface	Hyperlinked entry to the interface in physical inventory.
VLAN List	Name of the VLAN associated with the UNI interface.

Table 15-9	Device EVC Properties in Logical Inventory
------------	--

**Step 4** To view properties for an Ethernet LMI interface in physical interface, click the required interface name in the ELMI Interfaces table.

Table 15-10 describes the information displayed in the UNI Properties area in physical inventory.

 Table 15-10
 Ethernet LMI UNI Properties in Physical Inventory

Field	Description
Service Multiplexing Enabled	Whether or not the interface is configured for UNI multiplexing: True or False.
Bundling Enabled	Whether or not the interface is configured for UNI bundling: True or False.
UNI Id	UNI identifier.
Bundling Type	Type of bundling applied: All-to-One or None.
	This field appears only when a bundling type is set.

#### **Related Topics**

- Ethernet OAM Overview, page 15-2
- Viewing Connectivity Fault Management Properties, page 15-3
- Viewing Link OAM Properties, page 15-13

## **Viewing Link OAM Properties**

Link OAM is an optional sublayer implemented in the OSI Data Link Layer between the Logical Link Control and MAC sublayers.

The Link OAM frames, OAM Protocol Data Units (OAMPDUs), cannot propagate beyond a single hop within an Ethernet network. Link OAM processes include:

- Discovery—Discovery is the first Link OAM process. During discovery, Link OAM identifies the devices at each end of the link and learns their OAM capabilities.
- Link monitoring—Link OAM link monitoring includes:
  - Monitoring links and issuing notifications when error thresholds are exceeded or faults occur.
  - Collecting statistics on the number of frame errors (or percent of frames that have errors) and the number of coding symbol errors.
- Remote MIB Variable Retrieval—Provides 802.3ah MIB polling and response (but not writing).
- Remote Failure indication—Informs peers when a received path goes down. Because link connectivity faults caused by slowly deteriorating quality are difficult to detect, Link OAM communicates such failure conditions to its peer using OAMPDU flags. The failure conditions that can be communicated are a loss of signal in one direction on the link, an unrecoverable error (such as a power failure), or some other critical event.
- Remote Loopback—Puts the peer device in (near-end) intrusive loopback mode using the OAMPDU loopback control. Statistics can be collected during the link testing. In loopback mode, every frame received is transmitted back unchanged on the same port (except for OAMPDUs, which are needed to maintain the OAM session). Loopback mode helps ensure the quality of links during installation or troubleshooting. Loopback mode can be configured so that the service provider device can put the customer device into loopback mode, but the customer device cannot put the service provider device in loopback mode.

Prime Network Vision supports topology discovery based on Link OAM information and enables you to view Link OAM properties.

To view Link OAM properties:

- **Step 1** In Prime Network Vision, double-click the device configured for Link OAM.
- **Step 2** In the inventory window, choose **Logical Inventory > OAM**.

L

Figure 15-8 shows an example of Link OAM properties in logical inventory.

VUPE2-3400ME-FL [1M]     UDE2-3400ME-FL [1M]     Access Lists     Bridges     Cisco Discovery Protocol	Poll Now Table Types: 0AM							
Etł	hernet Link Aggregation hernet LMI	OAM		****				
IP OF	SLA Responder	Find : 🚺 🛃 🤜	7 聖 眉 辱					
e op	perating System	Local Port 🛛 🔁 🛆	Local Port ID	Admin Status	Port Status	Remote MAC Address		
	silient Ethernet Protocol outing Entities	UPE2-3400ME-FL#0:GigabitEthernet0/13	GigabitEthernet0/13	Up	active send			
	anning Tree Protocol	UPE2-3400ME-FL#0:GigabitEthernet0/14	GigabitEthernet0/14	Up	operational	00 25 46 79 DF 9B		
Physic	al Inventory	UPE2-3400ME-FL#0:GigabitEthernet0/15	GigabitEthernet0/15	Up	operational	00 24 C3 C7 CF 02		
		UPE2-3400ME-FL#0:GigabitEthernet0/16	GigabitEthernet0/16	Up	active send			
Device Zoom)							Line 0 (Size 4)	

Figure 15-8 Link OAM Properties in Logical Inventory

Table 15-11 describes the information displayed for Link OAM.

Table 15-11 Link OAM Properties in Logical Inventory

Field	Description
Table Types	Type of table. In this case, it is OAM.
OAM Table	·
Local Port	Name of the OAM-supported interface, hyperlinked to the location in physical inventory.
Local Port ID	Local port identifier, such as FastEthernet1/0/9.
Admin Status	Administrative status of the interface.
Port Status	Status of the port.
Remote MAC Address	Remote client MAC address.

Step 3 To view detailed information about an entry in the table, double-click the required entry. The Link OAM Data Properties window is displayed as shown in Figure 15-9.

Poll Now				
ocal Port:	c4-upe5#0:FastEthernet0/2	Local Port ID:	FastEthernet0/2	
admin Status:	Up	Port Status:	operational	
du Max Rate(Frames/sec):	10	Pdu Min Rate(Seconds/frame):	1	
ink Timeout(seconds):	5	High Threshold Action:	no action	
ink Fault Action:	no action	Dying Gasp Action:	no action	
iritical Event Action:	no action	Mode:	active	
Inidirection:	not supported	Link Monitor:	supported (on)	
emote Loopback:	not supported	Loopback Status:	no loopback	
1AC Address:	00 24 C3 C7 17 04	Vendor:	cisco	
lode:	active	Unidirection:	not supported	
ink Monitor:	supported	Remote Loopback:	not supported	

Figure 15-9 Link OAM Data Properties Window

Table 15-12 describes the information that is displayed in the Link OAM Data Properties window.

Table 15-12 Link OAM Data Properties Window

Field	Description	
Local Interface		
Local Port	Name of the OAM-supported interface, hyperlinked to the location in physical inventory.	
Local Port ID	Local port identifier.	
Admin Status	Administrative status of the interface: Up or Down.	
Port Status	Status of the port, such as Operational.	
PDU Max Rate (Frames/sec)	Maximum transmission rate measured by the number of OAM PDUs per second; for example, 10 packets per second.	
PDU Min Rate (Seconds/frame)	Minimum transmission rated measured by the number of seconds required for one OAM PDU; for example, 1 packet per 2 seconds.	
Link Timeout	Number of seconds of inactivity on a link before the link is dropped.	
High Threshold Action	Action that occurs when the high threshold for an error is exceeded.	
Link Fault Action	Action that occurs when the signal is lost.	
Dying Gasp Action	Action that occurs when an unrecoverable condition is encountered.	
Critical Event Action	Action that occurs when an unspecified vendor-specific critical event occurs.	
Mode	Mode of the interface: Active or Passive.	

Field	Description			
Unidirection	Status of unidirectional Ethernet on the local interface: Supported or Not supported.			
Link Monitor	Status of link monitoring on the local interface: Supported or Not supported.			
Remote Loopback	Status of remote loopback on the local interface: Supported or Not supported.			
Loopback Status	Status of loopback on the local interface: Supported or No loopback.			
Remote Client	· · · · ·			
MAC Address	MAC address for the remote client.			
Vendor	Vendor of the remote client.			
Mode	Mode of the remote client: Active or Passive.			
Unidirection	Status of unidirectional Ethernet on the remote client interface: Supported or Not supported.			
Link Monitor	Status of link monitoring on the remote client interface: Supported or Not supported.			
Remote Loopback	Status of loopback on the remote client interface: Supported or Not supported.			

Table 15-12	Link OAM Data Properties Window (continued)
-------------	---

Step 4To view Link OAM status in physical inventory, choose Physical Inventory > chassis > slot > interface.The Link OAM administrative status is displayed as shown in Figure 15-10.

	Poll Now				
C1-upe1 ▼ ■ Logical Inventory					
Access Lists	-Storm Control and Monitoring P	roperties			
Bridges	Storm Control:	Disabled Port Monitoring Status: Enabl	ed		*
CFM	Port Monitoring Interval: 1	10.0 sec MAC Address: 00 21	D7 EE EA 01		
Cisco Discovery Protocol					
Ethernet LMI	Ethernet LMI Enabled: f	alse OAM Admin Status: Up			-
IP SLA Responder Link Layer Discovery Protocol					
	-Gigabit Ethernet				
CFM     Cisco Discovery Protocol     Cisco Discovery Protocol     Discovery Protocol     Link Layer Discovery Protocol     OAM     Operating System     Routing Entities     Spanning Tree Protocol	MAC Address: 00 21	D7 EE EA 01 Ethernet LMI Enabled: fa	lse		
Routing Entities	OAM Admin Status: Up	Port Type: N	I		
Physical Inventory     Chassis					
Chassis     Glassis     Slot 0: Card - ME-3400G-12CS-A - F	-Discovery Protocols				
GigabitEthernet0/1					
GigabitEthernet0/2	Discovery Protocol Type:	CDP Info:	Up		*
GigabitEthernet0/3	MAC Address:	00 21 D7 EE EA 01 Ethernet LMI Enabled:	false		
GigabitEthernet0/4					<b>T</b>
GigabitEthernet0/5 GigabitEthernet0/6	Ethernet CSMA/CD				
GigabitEthernet0/7		44044			
GigabitEthernet0/8					
GigabitEthernet0/9	Find :	🖬 🛃 🗸 🥆 🐺 🌉 🖏			
GigabitEthernet0/10 GigabitEthernet0/11	Address 😌 🗡	Mask	VLAN Type	Operational State	VLAN ID
GigabitEthernet0/12			Bridge		(1) default 🔺
GinabitEthernet0/13 - No Trans	,		Bridge		(30) VLAN0
·····	_		Bridge		(102) VLAN
Device Zoom			Bridge		(103) VLAN
			Bridge		(100) VLAN
					•
					Line 0 (Size 105)
					Line 0 (Size 105)
	Sub Interfaces				Line U (Size 105)
					Line 0 (Size 105)
	Sub Interfaces				Line 0 (Size 105)
	Sub Interfaces	Description Location	Acknowledged	Creation Time	
	, Sub Interfaces	Description Location	Acknowledged	Creation Time	Ene 0 (Size 105)

Figure 15-10 Link OAM Administrative Status in Physical Inventory

#### **Related Topics**

- Ethernet OAM Overview, page 15-2
- Viewing Connectivity Fault Management Properties, page 15-3
- Viewing Ethernet LMI Properties, page 15-9

Viewing Link OAM Properties