



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*.

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| 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! |
|------------|----------|---------------|-----------------------|
|------------|----------|---------------|-----------------------|

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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 : | ₫ 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 | . | | 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

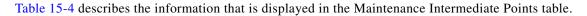


 Table 15-4
 CFM Maintenance Intermediate Point Properties

| 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 : | | ۇ ↓ 🖓 🎙 | | | | | | |
| 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. |

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| 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

| V 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: true | | |
| 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. | | | | |
| | Note 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 | :nown 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 | |
| ► | 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 | | | | | | |
| | | | | | D 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 | | | | | T |
| 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