Network Management and Monitoring Feature Guide for NFX Devices

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Network Management and Monitoring Feature Guide for NFX Devices
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About the Documentation

Documentation and Release Notes

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Using the Examples in This Manual

If you want to use the examples in this manual, you can use the **load merge** or the **load merge relative** command. These commands cause the software to merge the incoming configuration into the current candidate configuration. The example does not become active until you commit the candidate configuration.

If the example configuration contains the top level of the hierarchy (or multiple hierarchies), the example is a *full example*. In this case, use the **load merge** command.

If the example configuration does not start at the top level of the hierarchy, the example is a *snippet*. In this case, use the **load merge relative** command. These procedures are described in the following sections.

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Merging a Full Example

To merge a full example, follow these steps:

1. From the HTML or PDF version of the manual, copy a configuration example into a text file, save the file with a name, and copy the file to a directory on your routing platform.

   For example, copy the following configuration to a file and name the file **ex-script.conf**. Copy the **ex-script.conf** file to the **/var/tmp** directory on your routing platform.

```
system {
  scripts {
    commit {
      file ex-script.xsl;
    }
  }
}
interfaces {
  fxp0 {
    disable;
    unit 0 {
      family inet {
        address 10.0.0.1/24;
      }
    }
  }
}
```

2. Merge the contents of the file into your routing platform configuration by issuing the **load merge** configuration mode command:

```
[edit]
user@host# load merge /var/tmp/ex-script.conf
load complete
```

Merging a Snippet

To merge a snippet, follow these steps:

1. From the HTML or PDF version of the manual, copy a configuration snippet into a text file, save the file with a name, and copy the file to a directory on your routing platform.

   For example, copy the following snippet to a file and name the file **ex-script-snippet.conf**. Copy the **ex-script-snippet.conf** file to the **/var/tmp** directory on your routing platform.

```
commit {
  file ex-script-snippet.xsl; }
```

2. Move to the hierarchy level that is relevant for this snippet by issuing the following configuration mode command:

```
[edit]
```

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user@host# **edit system scripts**
[edit system scripts]

3. Merge the contents of the file into your routing platform configuration by issuing the **load merge relative** configuration mode command:

   [edit system scripts]
   user@host# **load merge relative /var/tmp/ex-script-snippet.conf**
   load complete

For more information about the **load** command, see CLI Explorer.

Documentation Conventions

Table 1 on page ix defines notice icons used in this guide.

Table 1: Notice Icons

Icon	Meaning	Description
	Informational note	Indicates important features or instructions.
	Caution	Indicates a situation that might result in loss of data or hardware damage.
	Warning	Alerts you to the risk of personal injury or death.
	Laser warning	Alerts you to the risk of personal injury from a laser.
	Tip	Indicates helpful information.
	Best practice	Alerts you to a recommended use or implementation.

Table 2 on page ix defines the text and syntax conventions used in this guide.

Table 2: Text and Syntax Conventions

Convention	Description	Examples
Bold text like this	Represents text that you type.	To enter configuration mode, type the **configure** command: user@host> **configure**

Table 2: Text and Syntax Conventions (continued)

<table>
<tr><th>Convention</th><th>Description</th><th>Examples</th></tr>
<tr><td><code>Fixed-width text like this</code></td><td>Represents output that appears on the terminal screen.</td><td><code>user@host></code> show chassis alarms

<code>No alarms currently active</code></td></tr>
<tr><td>Italic text like this</td><td>• Introduces or emphasizes important new terms.
• Identifies guide names.
• Identifies RFC and Internet draft titles.</td><td>• A policy term is a named structure that defines match conditions and actions.
• Junos OS CLI User Guide
• RFC 1997, BGP Communities Attribute</td></tr>
<tr><td>Italic text like this</td><td>Represents variables (options for which you substitute a value) in commands or configuration statements.</td><td>Configure the machine’s domain name:

[edit]
root@# set system domain-name domain-name</td></tr>
<tr><td>Text like this</td><td>Represents names of configuration statements, commands, files, and directories; configuration hierarchy levels; or labels on routing platform components.</td><td>• To configure a stub area, include the stub statement at the [edit protocols ospf area area-id] hierarchy level.
• The console port is labeled CONSOLE.</td></tr>
<tr><td>< > (angle brackets)</td><td>Encloses optional keywords or variables.</td><td>stub <default-metric <i>metric</i>>;</td></tr>
<tr><td>| (pipe symbol)</td><td>Indicates a choice between the mutually exclusive keywords or variables on either side of the symbol. The set of choices is often enclosed in parentheses for clarity.</td><td>broadcast | multicast

(string1 | string2 | string3)</td></tr>
<tr><td># (pound sign)</td><td>Indicates a comment specified on the same line as the configuration statement to which it applies.</td><td>rsvp { # Required for dynamic MPLS only</td></tr>
<tr><td>[ ] (square brackets)</td><td>Encloses a variable for which you can substitute one or more values.</td><td>community name members [community-ids]</td></tr>
<tr><td>Indention and braces ({ })</td><td>Identifies a level in the configuration hierarchy.</td><td rowspan="2">[edit]
routing-options {
  static {
    route default {
      nexthop address;
      retain;
    }
  }
}</td></tr>
<tr><td>; (semicolon)</td><td>Identifies a leaf statement at a configuration hierarchy level.</td></tr>
<tr><td colspan="3">GUI Conventions</td></tr>
<tr><td>Bold text like this</td><td>Represents graphical user interface (GUI) items you click or select.</td><td>• In the Logical Interfaces box, select All Interfaces.
• To cancel the configuration, click Cancel.</td></tr>
</table>

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Table 2: Text and Syntax Conventions (continued)

Convention	Description	Examples
> (bold right angle bracket)	Separates levels in a hierarchy of menu selections.	In the configuration editor hierarchy, select **Protocols>Ospf**.

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CHAPTER 1

Understanding Ethernet OAM Link Fault Management

Understanding Ethernet OAM Link Fault Management

Juniper Networks Junos operating system (Junos OS) for Juniper Networks allows the Ethernet interfaces on these switches to support the IEEE 802.3ah standard for the Operation, Administration, and Maintenance (OAM) of Ethernet in access networks. The standard defines OAM link fault management (LFM). You can configure IEEE 802.3ah OAM LFM on point-to-point Ethernet links that are connected either directly or through Ethernet repeaters. The IEEE 802.3ah standard meets the requirement for OAM capabilities even as Ethernet moves from being solely an enterprise technology to a WAN and access technology, and the standard remains backward-compatible with existing Ethernet technology.

Ethernet OAM provides the tools that network management software and network managers can use to determine how a network of Ethernet links is functioning. Ethernet OAM should:

- Rely only on the media access control (MAC) address or virtual LAN identifier for troubleshooting.
- Work independently of the actual Ethernet transport and function over physical Ethernet ports or a virtual service such as pseudowire.
- Isolate faults over a flat (or single operator) network architecture or nested or hierarchical (or multiprovider) networks.

The following OAM LFM features are supported:

- Discovery and Link Monitoring

  The discovery process is triggered automatically when OAM is enabled on the interface. The discovery process permits Ethernet interfaces to discover and monitor the peer on the link if it also supports the IEEE 802.3ah standard. You can specify the discovery mode used for IEEE 802.3ah OAM support. In active mode, the interface discovers and monitors the peer on the link if the peer also supports IEEE 802.3ah OAM functionality.

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In passive mode, the peer initiates the discovery process. After the discovery process has been initiated, both sides participate in discovery. The switch performs link monitoring by sending periodic OAM protocol data units (PDUs) to advertise OAM mode, configuration, and capabilities.

You can specify the number of OAM PDUs that an interface can miss before the link between peers is considered down.

- Remote Fault Detection

  Remote fault detection uses flags and events. Flags are used to convey the following: Link Fault means a loss of signal, Dying Gasp means an unrecoverable condition such as a power failure, and Critical Event means an unspecified vendor-specific critical event. You can specify the periodic OAM PDU sending interval for fault detection. The switch uses the Event Notification OAM PDU to notify the remote OAM device when a problem is detected. You can specify the action to be taken by the system when the configured link-fault event occurs.

- Remote Loopback Mode

  Remote loopback mode ensures link quality between the switch and a remote peer during installation or troubleshooting. In this mode, when the interface receives a frame that is not an OAM PDU or a pause frame, it sends it back on the same interface on which it was received. The link appears to be in the active state. You can use the returned loopback acknowledgement to test delay, jitter, and throughput.

  Junos OS can place a remote DTE into loopback mode (if remote loopback mode is supported by the remote DTE). When you place a remote DTE into loopback mode, the interface receives the remote loopback request and puts the interface into remote loopback mode. When the interface is in remote loopback mode, all frames except OAM PDUs are looped back without any changes made to the frames. OAM PDUs continue to be sent and processed.

Related Documentation

- Configuring Ethernet OAM Link Fault Management (CLI Procedure) on page 14
- *Example: Configuring Ethernet OAM Link Fault Management*

Configuring Ethernet OAM Link Fault Management (CLI Procedure)

Ethernet OAM link fault management (LFM) can be used for physical link-level fault detection and management. The IEEE 802.3ah LFM works across point-to-point Ethernet links either directly or through repeaters.

To configure Ethernet OAM LFM using the CLI:

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1. Enable IEEE 802.3ah OAM support on an interface:

```
[edit protocols oam ethernet link-fault-management]
user@switch# set interface interface-name
```

NOTE: You can configure Ethernet OAM LFM on aggregated interfaces.

NOTE: The remaining steps are optional. You can choose which of these features to configure for Ethernet OAM LFM on your switch.

2. Specify whether the interface or the peer initiates the discovery process by configuring the link discovery mode to **active** or **passive** (**active** = interface initiates; **passive** = peer initiates):

```
[edit protocols oam ethernet link-fault-management]
user@switch# set interface interface-namelink-discovery active
```

3. Configure a periodic OAM PDU-sending interval (in milliseconds) for fault detection:

```
[edit protocols oam ethernet link-fault-management]
user@switch# set interface pdu-intervalinterval
```

4. Specify the number of OAM PDUs that an interface can miss before the link between peers is considered down:

```
[edit protocols oam ethernet link-fault-management]
user@switch# set interface interface-name pdu-threshold threshold-value
```

5. Configure event threshold values on an interface for the local errors that trigger the sending of link event TLVs:

   - Set the threshold value (in seconds) for sending frame-error events or taking the action specified in the action profile:

     ```
     [edit protocols oam ethernet link-fault-management]
     user@switch# set interface interface-name event-thresholds frame-error count
     ```

   - Set the threshold value (in seconds) for sending frame-period events or taking the action specified in the action profile:

     ```
     [edit protocols oam ethernet link-fault-management]
     user@switch# set interface interface-name event-thresholds frame-period count
     ```

   - Set the threshold value (in seconds) for sending frame-period-summary events or taking the action specified in the action profile:

     ```
     [edit protocols oam ethernet link-fault-management]
     user@switch# set interface interface-name event-thresholds frame-period-summary count
     ```

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- Set the threshold value (in seconds) for sending symbol-period events or taking the action specified in the action profile:

  [edit protocols oam ethernet link-fault-management]
  user@switch# **set interface *interface-name* event-thresholds** symbol-period ***count***

NOTE: You can disable the sending of link event TLVs.

To disable the sending of link event TLVs:

[edit protocols oam ethernet link-fault-management]
user@switch# **set interface *interface-name*** negotiation-options no-allow-link-events

6. Create an action profile to define event fault flags and thresholds to be taken when the link fault event occurs. Then apply the action profile to one or more interfaces. (You can also apply multiple action profiles to a single interface.)

   a. Name the action profile:

      [edit protocols oam ethernet link-fault-management]
      user@switch# **set** action-profile ***profile-name***

   b. Specify actions to be taken by the system when the link fault event occurs:

      [edit protocols oam ethernet link-fault-management]
      user@switch# **set action-profile *profile-name*** action syslog

      user@switch# **set action-profile *profile-name* action** link-down

   c. Specify events for the action profile:

      [edit protocols oam ethernet link-fault-management]
      user@switch# **set action-profile *profile-name* event** link-adjacency-loss

NOTE: For each action profile, you must specify at least one link event and one action. The actions are taken only when all of the events in the action profile are true. If more than one action is specified, all actions are executed. You can set a low threshold for a specific action such as logging the error and set a high threshold for another action such as system logging.

7. Set a remote interface into loopback mode so that all frames except OAM PDUs are looped back without any changes made to the frames. Set the remote DTE in loopback mode (the remote DTE must support remote-loopback mode) and then enable remote loopback support for the local interface.

   [edit protocols oam ethernet link-fault-management]
   user@switch# **set interface *interface-name*** remote-loopback

   user@switch# **set interface *interface-name* negotiation-options allow-remote-loopback**

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Related Documentation

- *Example: Configuring Ethernet OAM Link Fault Management*
- Understanding Ethernet OAM Link Fault Management on page 13

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CHAPTER 2

Ethernet OAM Link Fault Management Configuration Statements

action (OAM LFM)

Syntax

```
action {
  syslog;
  link-down;
}
```

Hierarchy Level [edit protocols oam ethernet link-fault-management]

Release Information Statement introduced in Junos OS Release 9.4 for EX Series switches.

Description Define the action or actions to be taken when the OAM link fault management (LFM) fault event occurs.

The remaining statements are explained separately. See CLI Explorer.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- Configuring Ethernet OAM Link Fault Management (CLI Procedure) on page 14

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action-profile

List of Syntax

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Syntax: EX Series Switches and NFX Series Devices on page 21

Syntax: T, M, MX and ACX Series Routers, SRX Series Firewalls and EX Series Switches

```
action-profile profile-name {
  action {
    link-down;
    send-critical-event;
    syslog;
  }
  event {
    link-adjacency-loss;
    link-event-rate {
      frame-error count;
      frame-period count;
      frame-period-summary count;
      symbol-period count;
    }
    protocol-down;
  }
}
```

Syntax: EX Series Switches and NFX Series Devices

```
action-profile profile-name;
  action {
    syslog;
    link-down;
  }
  event {
    link-adjacency-loss;
    link-event-rate {
      frame-error count;
      frame-period count;
      frame-period-summary count;
      symbol-period count;
    }
  }
```

Hierarchy Level

[edit protocols oam ethernet link-fault-management]

Release Information

Statement introduced in Junos OS Release 8.5 for T, M, MX and ACX Series Routers, SRX Series Firewalls, and EX Series Switches, .
Statement introduced in Junos OS Release 9.4 for EX Series switches and NFX Series devices.

Description

Configure an Ethernet OAM link fault management (LFM) action profile by specifying a profile name.

The remaining statements are explained separately. See CLI Explorer.

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Options *profile-name*—Name of the action profile.

The remaining statements are explained separately. See CLI Explorer.

Required Privilege Level
interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.
routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation
- *Configuring an OAM Action Profile*
- Configuring Ethernet OAM Link Fault Management (CLI Procedure) on page 14

allow-remote-loopback

Syntax allow-remote-loopback;

Hierarchy Level [edit protocols oam ethernet link-fault-management interface *interface-name*]

Release Information Statement introduced in Junos OS Release 9.4 for EX Series switches.

Description Advertise that the interface is capable of getting into loopback mode. Enable remote loopback in Ethernet OAM link fault management (LFM) on all Ethernet interfaces or the specified interface on the EX Series switch.

WARNING: **If you disable this statement on a peer interface, LFM loopback enable and disable commands will not work. Before disabling this configuration, please make sure the remote-loopback interface is disabled.**

Required Privilege Level
routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation
- *Example: Configuring Ethernet OAM Link Fault Management*
- Configuring Ethernet OAM Link Fault Management (CLI Procedure) on page 14

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ethernet (Protocols OAM)

List of Syntax

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Syntax: EX Series Switches and NFX Series Devices on page 26

Syntax: MX, T, ACX Series Routers, SRX Firewalls, M320 and EX Series Switches

```
ethernet {
  connectivity-fault-management {
    action-profile profile-name {
      default-actions {
        interface-down;
      }
    }
    performance-monitoring {
      delegate-server-processing;
      hardware-assisted-timestamping;
      hardware-assisted-keepalives;
      sla-iterator-profiles {
        profile-name {
          avg-fd-twoway-threshold;
          avg-ifdv-twoway-threshold;
          avg-flr-forward-threshold;
          avg-flr-backward-threshold;
          disable;
          calculation-weight {
            delay delay-weight;
            delay-variation delay-variation-weight;
          }
          cycle-time milliseconds;
          iteration-period connections;
          measurement-type (loss | statistical-frame-loss | two-way-delay);
        }
      }
    }
    linktrace {
      age (30m | 10m | 1m | 30s | 10s);
      path-database-size path-database-size;
    }
    maintenance-domain domain-name {
      level number;
      name-format (character-string | none | dns | mac+2octet);
      maintenance-association ma-name {
        short-name-format (character-string | vlan | 2octet | rfc-2685-vpn-id);
        protect-maintenance-association protect-ma-name;
        remote-maintenance-association remote-ma-name;
        continuity-check {
          convey-loss-threshold;
          hold-interval minutes;
          interface-status-tlv;
          interval (10m | 10s | 1m | 1s| 100ms);
          loss-threshold number;
          port-status-tlv;
        }
        mep mep-id {
```

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```
            auto-discovery;
            direction (up | down);
            interface interface-name (protect | working);
            lowest-priority-defect (all-defects | err-xcon | mac-rem-err-xcon | no-defect |
              rem-err-xcon | xcon );
            priority number;
            remote-mep mep-id {
              action-profile profile-name;
              sla-iterator-profile profile-name {
                data-tlv-size size;
                iteration-count count-value;
                priority priority-value;
              }
            }
          }
        }
      }
    }
    evcs evc-id {
      evc-protocol cfm management-domain domain-id (management-association
        association-id | vpls (routing-instance instance-id);
      remote-uni-count count;
      multipoint-to-multipoint;
    }
    link-fault-management {
      action-profile profile-name {
        action {
          link-down;
          send-critical-event;
          syslog;
        }
        event {
          link-adjacency-loss;
          link-event-rate {
            frame-error count;
            frame-period count;
            frame-period-summary count;
            symbol-period count;
          }
          protocol-down;
        }
      }
      interface interface-name {
        apply-action-profile;
        link-discovery (active | passive);
        loopback-tracking;
        pdu-interval interval;
        pdu-threshold threshold-value;
        remote-loopback;
        event-thresholds {
          frame-error count;
          frame-period count;
          frame-period-summary count;
          symbol-period count;
        }
        negotiation-options {
```

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```
            allow-remote-loopback;
            no-allow-link-events;
         }
      }
   }
   lmi {
      status-counter count;
      polling-verification-timer value;
      interface name {
         uni-id uni-name;
         status-counter number;
         polling-verification-timer value;
         evc-map-type (all-to-one-bundling | bundling | service-multiplexing);
         evc evc-name {
            default-evc;
            vlan-list vlan-id-list;
         }
      }
   }
}
```

Syntax: EX Series Switches and NFX Series Devices

```
ethernet {
  connectivity-fault-management {
    action-profile profile-name {
      action {
        interface-down;
      }
      default-actions {
        interface-down;
      }
      event {
        adjacency-loss;
      }
    }
    esp-traceoptions {
      file filename <files number> <no-stamp> <replace> <size size> <world-readable |
        no-world-readable>;
      flag (all |error | esp | interface | krt | lib |normal |task |timer);
    }
    linktrace {
      age (30m | 10m | 1m | 30s | 10s);
      path-database-size path-database-size;
    }
    maintenance-domain domain-name {
      level number;
      mip-half-function (none | default |explicit);
      name-format (character-string | none | dns | mac+2oct);
      maintenance-association ma-name {
        continuity-check {
          hold-interval minutes;
          interface-status-tlv;
          interval (10m | 10s | 1m | 1s| 100ms);
          loss-threshold number;
          port-status-tlv;
        }
        mep mep-id {
          auto-discovery;
          direction down;
          interface interface-name;
          priority
          remote-mep mep-id {
            action-profile profile-name;
            sla-iterator-profile profile-name {
              data-tlv-size size;
              iteration-count count-value;
              priority priority-value;
            }
          }
        }
        short-name-format (character-string | vlan | 2octet | rfc-2685-vpn-id);
      }
    }
    performance-monitoring {
      sla-iterator-profiles {
        profile-name {
          calculation-weight {
            delay delay-value;
```


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```
          delay-variation delay-variation-value;
        }
        cycle-time cycle-time-value;
        iteration-period iteration-period-value;
        measurement-type two-way-delay;
        passive;
      }
    }
  }
  traceoptions {
    file filename <files number> <match regex> <size size> <world-readable |
      no-world-readable>;
    flag flag ;
    no-remote-trace;
  }
}
link-fault-management {
  action-profile profile-name;
    action {
      syslog;
      link-down;
    }
    event {
      link-adjacency-loss;
      link-event-rate {
        frame-error count;
        frame-period count;
        frame-period-summary count;
        symbol-period count;
      }
    }
  interface interface-name {
    link-discovery (active | passive);
    pdu-interval interval;
    pdu-threshold threshold-value;
    remote-loopback;
    event-thresholds {
      frame-errorcount;
      frame-period count;
      frame-period-summary count;
      symbol-period count;
    }
    negotiation-options {
      allow-remote-loopback;
      no-allow-link-events;
    }
  }
  traceoptions {
    file filename <files number> <match regex> <size size> <world-readable |
      no-world-readable>;
    flag flag ;
    no-remote-trace;
  }
}
}
```

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Hierarchy Level [edit protocols oam]

Release Information Statement introduced in Junos OS Release 8.2 for MX, T, ACX Series routers, SRX firewalls, M320 and EX Series switches.
Statement introduced in Junos OS Release 9.4 for EX Series switches and NFX Series devices.
connectivity-fault-management introduced in Junos OS Release 10.2 for EX Series switches.

Description Provide IEEE 802.3ah Operation, Administration, and Maintenance (OAM) support for Ethernet interfaces or configure connectivity fault management (CFM) for IEEE 802.1ag Operation, Administration, and Management (OAM) support.

The remaining statements are explained separately. See CLI Explorer.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.
routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Enabling IEEE 802.3ah OAM Support*
- *Example: Configuring Ethernet OAM Link Fault Management*

event-thresholds

Syntax

```
event-thresholds {
  frame-error count;
  frame-period count;
  frame-period-summary count;
  symbol-period count;
}
```

Hierarchy Level [edit protocols oam ethernet link-fault-management interface *interface-name*]

Release Information Statement introduced in Junos OS Release 9.4 for EX Series switches.

Description Configure threshold limit values for link events in periodic OAM PDUs.

The remaining statements are explained separately. See CLI Explorer.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- Configuring Ethernet OAM Link Fault Management (CLI Procedure) on page 14

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event (LFM)

List of Syntax

Syntax: MX, M, T, ACX Series Routers, SRX Firewalls and EX Series Switches on page 29
Syntax: EX Series Switches and NFX Series Devices on page 29

Syntax: MX, M, T, ACX Series Routers, SRX Firewalls and EX Series Switches

```
event {
  link-adjacency-loss;
  link-event-rate {
    frame-error count;
    frame-period count;
    frame-period-summary count;
    symbol-period count;
    }
  protocol-down;
}
```

Syntax: EX Series Switches and NFX Series Devices

```
event {
  link-adjacency-loss;
  link-event-rate {
    frame-error count;
    frame-period count;
    frame-period-summary count;
    symbol-period count;
  }
}
```

Hierarchy Level

[edit protocols oam ethernet link-fault-management action-profile]

Release Information

Statement introduced in Junos OS Release 8.5 for MX, M, T, ACX Series routers, SRX Series firewalls and EX Series switches.
Statement introduced in Junos OS Release 9.4 for EX Series switches and NFX devices.

Description

Configure link events in an action profile for Ethernet OAM link fault management (LFM).

The remaining statements are explained separately. See CLI Explorer.

Required Privilege Level

interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.
routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Monitoring Protocol Status*
- Configuring Ethernet OAM Link Fault Management (CLI Procedure) on page 14

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frame-error

Syntax

frame-error *count*;

Hierarchy Level

[edit protocols oam ethernet link-fault-management event link-event-rate],
[edit protocols oam ethernet link-fault-management interface *interface-name* event-thresholds]

Release Information

Statement introduced in Junos OS Release 9.4 for EX Series switches.

Description

Configure the threshold value for sending frame error events or taking the action specified in the action profile.

Frame errors occur on the underlying physical layer. The threshold is reached when the number of frame errors reaches the configured value.

Options

count—Threshold count in seconds for frame error events.

Range: 1 through 100 seconds

Default: 1 second

Required Privilege Level

routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- Configuring Ethernet OAM Link Fault Management (CLI Procedure) on page 14

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frame-period

Syntax

frame-period *count*;

Hierarchy Level

[edit protocols oam ethernet link-fault-management event link-event-rate],
[edit protocols oam ethernet link-fault-management interface *interface-name* event-thresholds]

Release Information

Statement introduced in Junos OS Release 9.4 for EX Series switches.

Description

Configure the number of frame errors within the last N frames that has exceeded a threshold.

Frame errors occur on the underlying physical layer. The threshold is reached when the number of frame errors reaches the configured value.

Options

count—Threshold count in seconds for frame error events.

Range: 1 through 100 seconds

Required Privilege Level

routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- Configuring Ethernet OAM Link Fault Management (CLI Procedure) on page 14

frame-period-summary

Syntax

frame-period-summary *count*;

Hierarchy Level

[edit protocols oam ethernet link-fault-management event link-event-rate],
[edit protocols oam ethernet link-fault-management interface *interface-name* event-thresholds]

Release Information

Statement introduced in Junos OS Release 9.4 for EX Series switches.

Description

Configure the threshold value for sending frame period summary error events or taking the action specified in the action profile.

An errored frame second is any 1-second period that has at least one errored frame. This event is generated if the number of errored frame seconds is equal to or greater than the specified threshold for that period.

Options

count—Threshold count in seconds for frame period summary error events.

Range: 1 through 100 seconds

Required Privilege Level

routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- Configuring Ethernet OAM Link Fault Management (CLI Procedure) on page 14

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oam

Syntax

```
oam {
  ethernet{
    connectivity-fault-management {
      action-profile profile-name {
        action {
          interface-down;
        }
        default-actions {
          interface-down;
        }
        event {
          adjacency-loss;
        }
      }
      linktrace {
        age (30m | 10m | 1m | 30s | 10s);
        path-database-size path-database-size;
      }
      maintenance-domain domain-name {
        level number;
        mip-half-function (none | default |explicit);
        name-format (character-string | none | dns | mac+2oct);
        maintenance-association ma-name {
          continuity-check {
            hold-interval minutes;
            interface-status-tlv;
            interval (10m | 10s | 1m | 1s| 100ms);
            loss-threshold number;
            port-status-tlv;
          }
          mep mep-id {
            auto-discovery;
            direction down;
            interface interface-name;
            remote-mep mep-id {
              action-profile profile-name;
            }
          }
        }
      }
      performance-monitoring {
        sla-iterator-profiles {
          profile-name {
            calculation-weight {
              delay delay-value;
              delay-variation delay-variation-value;
            }
            cycle-time cycle-time-value;
            iteration-period iteration-period-value;
            measurement-type two-way-delay;
            passive;
          }
```

```
                }
            }
        }
        link-fault-management {
            action-profile profile-name;
                action {
                    syslog;
                    link-down;
                }
                event {
                    link-adjacency-loss;
                    link-event-rate {
                        frame-error count;
                        frame-period count;
                        frame-period-summary count;
                        symbol-period count;
                    }
                }
            interface interface-name {
                link-discovery (active | passive);
                pdu-interval interval;
                pdu-threshold threshold-value;
                remote-loopback;
                event-thresholds {
                    frame-errorcount;
                    frame-period count;
                    frame-period-summary count;
                    symbol-period count;
                }
                negotiation-options {
                    allow-remote-loopback;
                    no-allow-link-events;
                }
            }
        }
    }
```

Hierarchy Level [edit protocols]

Release Information Statement introduced in Junos OS Release 9.4 for EX Series switches.
connectivity-fault-management introduced in Junos OS Release 10.2 for EX Series switches.

Description Provide IEEE 802.3ah Operation, Administration, and Maintenance (OAM) link fault management (LFM) support for Ethernet interfaces on EX Series switches or configure connectivity fault management (CFM) for IEEE 802.1ag Operation, Administration, and Management (OAM) support on the switches.

The remaining statements are explained separately. See CLI Explorer.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

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Related Documentation

- *Example: Configuring Ethernet OAM Link Fault Management*
- *Example: Configuring Ethernet OAM Connectivity Fault Management on EX Series Switches*
- Configuring Ethernet OAM Link Fault Management (CLI Procedure) on page 14
- *Configuring Ethernet OAM Connectivity Fault Management (CLI Procedure)*

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interface (OAM Link-Fault Management)

List of Syntax

Syntax: T, M, MX and ACX Series Routers, SRX Series Firewalls and EX Series Switches on page 36
Syntax: EX Series Switches and NFX Series Devices on page 36

Syntax: T, M, MX and ACX Series Routers, SRX Series Firewalls and EX Series Switches

```
interface interface-name {
  apply-action-profile profile-name;
  link-discovery (active | passive);
  pdu-interval interval;
  pdu-threshold threshold-value;
  remote-loopback;
  event-thresholds {
    frame-error count;
    frame-period count;
    frame-period-summary count;
    symbol-period count;
  }
  negotiation-options {
    allow-remote-loopback;
    no-allow-link-events;
  }
}
```

Syntax: EX Series Switches and NFX Series Devices

```
interface interface-name {
  link-discovery (active | passive);
  pdu-interval interval;
  pdu-threshold threshold-value;
  remote-loopback;
  event-thresholds {
    frame-errorcount;
    frame-period count;
    frame-period-summary count;
    symbol-period count;
  }
  negotiation-options {
    allow-remote-loopback;
    no-allow-link-events;
  }
}
```

Hierarchy Level [edit protocols oam ethernet link-fault-management]

Release Information Statement introduced in Junos OS Release 8.2 for T, M, MX and ACX Series Routers, SRX Series firewalls and EX Series switches.
Statement introduced in Junos OS Release 9.4 for EX Series switches and NFX Series devices.

Description Configure Ethernet OAM link fault management (LFM) for all interfaces or for specific interfaces.

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For Ethernet interfaces on M320, MX Series, and T Series routers, configure IEEE 802.3ah Operation, Administration, and Management (OAM) support.

Options **interface** ***interface-name***—Interface to be enabled for IEEE 802.3ah link fault management OAM support.

The remaining statements are described separately.

Required Privilege Level
interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.
routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation
- *Enabling IEEE 802.3ah OAM Support*
- *Example: Configuring Ethernet OAM Link Fault Management*
- Configuring Ethernet OAM Link Fault Management (CLI Procedure) on page 14

link-adjacency-loss

Syntax link-adjacency-loss;

Hierarchy Level [edit protocols oam ethernet link-fault-management action-profile event]

Release Information Statement introduced in Junos OS Release 9.4 for EX Series switches.

Description Configure **loss of adjacency** event with the IEEE 802.3ah link fault management (LFM) peer. When included, the loss of adjacency event triggers the action specified under the action statement.

Required Privilege Level
routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation
- *Example: Configuring Ethernet OAM Link Fault Management*
- Configuring Ethernet OAM Link Fault Management (CLI Procedure) on page 14

link-discovery

Syntax link-discovery (active | passive);

Hierarchy Level [edit protocols oam ethernet link-fault-management interface *interface-name*]

Release Information Statement introduced in Junos OS Release 9.4 for EX Series switches.

Description Specify the discovery mode used for IEEE 802.3ah Operation, Administration, and Maintenance (OAM) link fault management (LFM) support. The discovery process is triggered automatically when OAM 802.3ah functionality is enabled on an interface. Link monitoring is done when the interface sends periodic OAM PDUs.

Options *active*—In active mode, the interface discovers and monitors the peer on the link if the peer also supports IEEE 802.3ah OAM functionality.

passive—In passive mode, the peer initiates the discovery process.

Once the discovery process is initiated, both sides participate in discovery.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- Configuring Ethernet OAM Link Fault Management (CLI Procedure) on page 14

link-down

Syntax link-down;

Hierarchy Level [edit protocols oam ethernet link-fault-management action-profile action]

Release Information Statement introduced in Junos OS Release 9.4 for EX Series switches.

Description Mark the interface as down for transit traffic.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- Configuring Ethernet OAM Link Fault Management (CLI Procedure) on page 14

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link-event-rate

Syntax

```
link-event-rate {
  frame-error count;
  frame-period count;
  frame-period-summary count;
  symbol-period count;
}
```

Hierarchy Level [edit protocols oam ethernet link-fault-management action-profile event]

Release Information Statement introduced in Junos OS Release 9.4 for EX Series switches.

Description Configure the number of link fault management (LFM) events per second.

The remaining statements are explained separately. See CLI Explorer.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- Configuring Ethernet OAM Link Fault Management (CLI Procedure) on page 14

link-fault-management

Syntax

```
link-fault-management {
  action-profile profile-name;
    action {
      syslog;
      link-down;
    }
    event {
      link-adjacency-loss;
      link-event-rate {
        frame-error count;
        frame-period count;
        frame-period-summary count;
        symbol-period count;
      }
    }
  interface interface-name {
    link-discovery (active | passive);
    pdu-interval interval;
    pdu-threshold threshold-value;
    remote-loopback;
    event-thresholds {
      frame-errorcount;
      frame-period count;
      frame-period-summary count;
      symbol-period count;
    }
    negotiation-options {
      allow-remote-loopback;
      no-allow-link-events;
    }
  }
}
```

Hierarchy Level [edit protocols oam ethernet]

Release Information Statement introduced in Junos OS Release 9.4 for EX Series switches.

Description Configure Ethernet OAM link fault management (LFM) for all interfaces or for specific interfaces.

The remaining statements are explained separately. See CLI Explorer.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Example: Configuring Ethernet OAM Link Fault Management*
- Configuring Ethernet OAM Link Fault Management (CLI Procedure) on page 14

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negotiation-options

Syntax

```
negotiation-options {
  allow-remote-loopback;
  no-allow-link-events;
}
```

Hierarchy Level [edit protocols oam ethernet link-fault-management interface *interface-name*]

Release Information Statement introduced in Junos OS Release 9.4 for EX Series switches.

Description Enable and disable IEEE 802.3ah Operation, Administration, and Maintenance (OAM) link fault management (LFM) features for Ethernet interfaces.

The remaining statements are explained separately. See CLI Explorer.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- Configuring Ethernet OAM Link Fault Management (CLI Procedure) on page 14

no-allow-link-events

Syntax no-allow-link-events;

Hierarchy Level [edit protocols oam ethernet link-fault-management interface *interface-name* negotiation-options]

Release Information Statement introduced in Junos OS Release 9.4 for EX Series switches.

Description Disable the sending of link event TLVs.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- Configuring Ethernet OAM Link Fault Management (CLI Procedure) on page 14

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pdu-interval

Syntax pdu-interval *interval*;

Hierarchy Level [edit protocols oam ethernet link-fault-management interface *interface-name*]

Release Information Statement introduced in Junos OS Release 8.2 for MX, M, T, ACX, Series routers, SRX Series firewalls, and EX Series Switches.
Statement introduced in Junos OS Release 9.4 for EX Series switches.

Description For Ethernet interfaces on EX Series switches and M320, M120, MX Series, and T Series routers, specify the periodic OAM PDU sending interval for fault detection. Used for IEEE 802.3ah Operation, Administration, and Management (OAM) support.

Options *interval*—Periodic OAM PDU sending interval.

Range: For MX, M, T, ACX, Series routers, SRX Series firewalls and EX Series switches – 100 through 1000 milliseconds

Default: For EX Series switches –1000 milliseconds

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.
routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Configuring the OAM PDU Interval*
- *Example: Configuring Ethernet OAM Link Fault Management*
- Configuring Ethernet OAM Link Fault Management (CLI Procedure) on page 14

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pdu-threshold

Syntax pdu-threshold *threshold-value*;

Hierarchy Level [edit protocols oam ethernet link-fault-management interface *interface-name*]

Release Information Statement introduced in Junos OS Release 8.2 for T, M, MX and ACX Series routers, SRX Series firewalls and EX Series switches.
Statement introduced in Junos OS Release 9.4 for EX Series switches and NFX Series devices.

Description Configure how many protocol data units (PDUs) are missed before declaring the peer lost in Ethernet OAM link fault management (LFM) for all interfaces or for specific interfaces.

For Ethernet interfaces on EX Series switches and M320, M120, MX Series, and T Series routers, specify the number of OAM PDUs to miss before an error is logged. Used for IEEE 802.3ah Operation, Administration, and Management (OAM) support.

Options ***threshold-value***—The number of PDUs missed before declaring the peer lost.

Range: 3 through 10 PDUs

Default: 3 PDUs

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *Configuring the OAM PDU Threshold*
- Configuring Ethernet OAM Link Fault Management (CLI Procedure) on page 14

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remote-loopback

Syntax remote-loopback;

Hierarchy Level [edit protocols oam ethernet link-fault-management interface *interface-name*]

Release Information Statement introduced in Junos OS Release 9.4 for EX Series switches.

Description Set the data terminal equipment (DTE) in loopback mode. Remove the statement from the configuration to take the DTE out of loopback mode. It is used for IEEE 802.3ah Operation, Administration, and Maintenance (OAM) link fault management (LFM) support.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation
- *Example: Configuring Ethernet OAM Link Fault Management*
- Configuring Ethernet OAM Link Fault Management (CLI Procedure) on page 14

symbol-period

Syntax symbol-period *count*;

Hierarchy Level [edit protocols oam ethernet link-fault-management action-profile; event link-event-rate]
,
[edit protocols oam ethernet link-fault-management interface *interface-name* event-thresholds]

Release Information Statement introduced in Junos OS Release 9.4 for EX Series switches.

Description Configure the threshold for sending symbol period events or taking the action specified in the action profile.

Symbol code errors occur on the underlying physical layer. The symbol period threshold is reached when the number of symbol errors reaches the configured value within the period. You cannot configure the default value to a different value.

Options *count*—Threshold count in seconds for symbol period events.

Range: 1 through 100 seconds

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation
- Configuring Ethernet OAM Link Fault Management (CLI Procedure) on page 14

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syslog (OAM Action)

Syntax syslog;

Hierarchy Level [edit protocols oam ethernet link-fault-management action-profile action]

Release Information Statement introduced in Junos OS Release 8.5 for T, M, MX and ACX Series routers, SRX Series firewalls and EX Series switches.
Statement introduced in Junos OS Release 9.4 for EX Series switches and NFX Series devices.

Description Generate a syslog message for the Ethernet Operation, Administration, and Management (OAM) event.

Generate a system log message for the Ethernet Operation, Administration, and Maintenance (OAM) link fault management (LFM) event.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.
routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Specifying the Actions to Be Taken for Link-Fault Management Events*
- Configuring Ethernet OAM Link Fault Management (CLI Procedure) on page 14

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traceoptions (Individual Interfaces)

List of Syntax

Syntax (Individual interfaces with PTX Series, EX Series, ACX Series) on page 46
Syntax (Individual interfaces with QFX Series, OCX1100, EX4600, NFX Series) on page 46
Syntax (OAMLFM with EX Series, QFX Series, NFX Series) on page 46
Syntax (Interface process with ACX Series, SRX Series, MX Series, M Series, T Series) on page 46

Syntax (Individual interfaces with PTX Series, EX Series, ACX Series)

```
traceoptions {
  file filename <files name> <size size> <world-readable | no-world-readable>;
  flag flag;
  match;
}
```

Syntax (Individual interfaces with QFX Series, OCX1100, EX4600, NFX Series)

```
traceoptions {
  flag flag;
}
```

Syntax (OAMLFM with EX Series, QFX Series, NFX Series)

```
traceoptions {
  file filename <files number> <match regex> <size size> <world-readable |
    no-world-readable>;
  flag flag ;
  no-remote-trace;
}
```

Syntax (Interface process with ACX Series, SRX Series, MX Series, M Series, T Series)

```
traceoptions {
  file <filename> <files number> <match regular-expression> <size size> <world-readable |
    no-world-readable>;
  flag flag <disable>;
  no-remote-trace;
}
```

Hierarchy Level (Individual interfaces with PTX Series, EX Series, ACX Series, QFX Series, OCX1100, EX4600, NFX Series)

[edit interfaces *interface-name*]

Hierarchy Level (Interface process with ACX Series, SRX Series, MX Series, M Series, T Series)

[edit interfaces]

Release Information

Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 12.2 for ACX Series Universal Metro Routers.

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Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in JUNOS Release 10.2 for EX Series switches.
Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Define tracing operations for individual interfaces.

To specify more than one tracing operation, include multiple **flag** statements.

The interfaces **traceoptions** statement does not support a trace file. The logging is done by the kernel, so the tracing information is placed in the system **syslog** file in the directory ***/var/log/dcd*** .

On EX Series, QFX Series, and NFX Series platforms, configure tracing options the link fault management.

On ACX Series, SRX Series, MX Series, M Series, and T Series platforms define tracing operations for the interface process (dcd).

Default If you do not include this statement, no interface-specific tracing operations are performed.

Options Table 3 on page 49 lists options for traceoption command for the following platforms:

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Table 3: Options for traceoptions

Option	Individual interfaces with PTX Series, ACX Series, EX Series	Individual interfaces with QFX Series, QFabric System, OCX1100, EX4600, NFX Series	Interface Process with OAMLFM with EX Series, QFX Series, NFX Series	Interface process with ACX Series, SRX Series, MX Series, M Series, T Series
file *filename*	—Name of the file to receive the output of the tracing operation. Enclose the name within quotation marks. All files are placed in the directory */var/log/dcd* . By default, interface process tracing output is placed in the file.		—Name of the file to receive the output of the tracing operation. Enclose the name within quotation marks. All files are placed in the directory */var/log/dcd* .	—Name of the file to receive the output of the tracing operation. Enclose the name within quotation marks. All files are placed in the directory*/var/log/dcd* . By default, interface process tracing output is placed in the file **dcd**.
files *number*	—(Optional) Maximum number of trace files. When a trace file named trace-file reaches its maximum size, it is renamed **trace-file.0**, then **trace-file.1**, and so on, until the maximum number of trace files is reached. Then the oldest trace file is overwritten.		—(Optional) Maximum number of trace files. When a trace file named trace-file reaches its maximum size, it is renamed trace-file.0, then trace-file.1, and so on, until the maximum *x*k to specify KB, *x*m to specify MB, or *x*g to specify GB number of trace files is reached. Then the oldest trace file is overwritten. If you specify a maximum number of files, you also must specify a maximum file size with the size option.	—(Optional) Maximum number of trace files. When a trace file named ***trace-file*** reaches its maximum size, it is renamed ***trace-file*.0**, then ***trace-file*.1**, and so on, until the maximum number of trace files is reached. Then the oldest trace file is overwritten. If you specify a maximum number of files, you also must specify a maximum file size with the **size** option. *Range:* 2 through 1000 *Default:* 3 files
flag	—Tracing operation to perform. To specify more than one tracing operation, include multiple ***flag*** statements. The following are the interface-specific tracing options. • **all**—All interface tracing operations • **event**—Interface events • **ipc**—Interface interprocess	—Tracing operation to perform. To specify more than one tracing operation, include multiple ***flag*** statements. The following are the interface-specific tracing options. • **all**—All interface tracing operations • **event**—Interface events • **ipc**—Interface interprocess	—Tracing operation to perform. To specify more than one tracing operation, include multiple ***flag*** statements. You can include the following flags: • **action-profile**—Trace action profile invocation events. • **all**—Trace all events. • **configuration**—Trace configuration events. • **protocol**—Trace	—Tracing operation to perform. To specify more than one tracing operation, include multiple ***flag*** statements. You can include the following flags: • **all** • **change-events**—Log changes that produce configuration events • **config-states**—Log the configuration

Table 3: Options for traceoptions (continued)

Option	Individual interfaces with PTX Series, ACX Series, EX Series	Individual interfaces with QFX Series, QFabric System, OCX1100, EX4600, NFX Series	Interface Process with OAMLFM with EX Series, QFX Series, NFX Series	Interface process with ACX Series, SRX Series, MX Series, M Series, T Series
	communication (IPC) messages • **media**—Interface media changes • **q921**—Trace ISDN Q.921 frames • **q931**—Trace ISDN Q.931 frames	communication (IPC) messages • **media**—Interface media changes • **q921**—Trace ISDN Q.921 frames • **q931**—Trace ISDN Q.931 frames	protocol processing events. • **routing socket**—Trace routing socket events.	state machine changes • **kernel**—Log configuration IPC messages to kernel • **kernel-detail**—Log details of configuration messages to kernel
match	—(Optional) Regular expression for lines to be traced.		—(Optional) Refine the output to log only those lines that match the given regular expression.	
size *size*	—(Optional) Maximum size of each trace file, in kilobytes (KB), megabytes (MB), or gigabytes (GB). When a trace file named **trace-file** reaches this size, it is renamed **trace-file.0**. When the **trace-file** again reaches its maximum size, **trace-file.0** is renamed **trace-file.1** and **trace-file** is renamed **trace-file.0**. This renaming scheme continues until the maximum number of trace files is reached. Then, the oldest trace file is overwritten.		—(Optional) Maximum size of each trace file, in kilobytes (KB), megabytes (MB), or gigabytes (GB). When a trace file named trace-file reaches its maximum size, it is renamed trace-file.0, then trace-file.1, and so on, until the maximum number of trace files is reached. Then the oldest trace file is overwritten. If you specify a maximum number of files, you also must specify a maximum file size with the files option. *Syntax:* *x*k to specify KB, *x*m to specify MB, or *x*g to specify GB *Range:* 10 KB through 1 GB *Default:* 128 KB *Default:* If you do not include this option, tracing output is appended to an existing trace file.	

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Table 3: Options for traceoptions (continued)

Option	Individual interfaces with PTX Series, ACX Series, EX Series	Individual interfaces with QFX Series, QFabric System, OCX1100, EX4600, NFX Series	Interface Process with OAMLFM with EX Series, QFX Series, NFX Series	Interface process with ACX Series, SRX Series, MX Series, M Series, T Series
				—(Optional) Maximum size of each trace file, in kilobytes (KB), megabytes (MB), or gigabytes (GB). When a trace file named ***trace-file*** reaches this size, it is renamed ***trace-file*.0**. When the ***trace-file*** again reaches its maximum size, ***trace-file*.0** is renamed ***trace-file*.1** and ***trace-file*** is renamed ***trace-file*.0**. This renaming scheme continues until the maximum number of trace files is reached. Then, the oldest trace file is overwritten. If you specify a maximum file size, you also must specify a maximum number of trace files with the **files** option. *Syntax:* ***x*k** to specify kilobytes, ***x*m** to specify megabytes, or ***x*g** to specify gigabytes *Range:* 10 KB through the maximum file size supported on your router *Default:* 1 MB
no-world-readable	—(Optional) Prevent any user from reading the log file.		—(Optional) Restrict file access to the user who created the file.	—(Optional) Disallow any user to read the log file.
world-readable	—(Optional) Allow any user to read the log file.		—(Optional) Enable unrestricted file access.	—(Optional) Allow any user to read the log file.
disable				

Table 3: Options for traceoptions (continued)

Option	Individual interfaces with PTX Series, ACX Series, EX Series	Individual interfaces with QFX Series, QFabric System, OCX1100, EX4600, NFX Series	Interface Process with OAMLFM with EX Series, QFX Series, NFX Series	Interface process with ACX Series, SRX Series, MX Series, M Series, T Series
				—(Optional) Disable the tracing operation. You can use this option to disable a single operation when you have defined a broad group of tracing operations, such as **all**.
no-remote-trace			—(Optional) Disable the remote trace.	-
match ***regex***				—(Optional) Refine the output to include only those lines that match the given regular expression.

Required Privilege Level

interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.
routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- *Tracing Operations of an Individual Router Interface*
- *Tracing Operations of an Individual Router or Switch Interface*
- *Example: Configuring Ethernet OAM Link Fault Management*
- Configuring Ethernet OAM Link Fault Management (CLI Procedure) on page 14
- *Tracing Operations of the Interface Process*

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CHAPTER 3

Ethernet OAM Link Fault Management Operational Command

show oam ethernet link-fault-management

Syntax

show oam ethernet link-fault-management
<brief | detail>
<*interface-name*>

Release Information

Command introduced in Junos OS Release 9.4 for EX Series switches.

Description

Displays Operation, Administration, and Maintenance (OAM) link fault management (LFM) information for Ethernet interfaces.

Options

brief | detail—(Optional) Display the specified level of output.

interface-name —(Optional) Display link fault management information for the specified Ethernet interface only.

Required Privilege Level

view

Related Documentation

- *Example: Configuring Ethernet OAM Link Fault Management*
- Configuring Ethernet OAM Link Fault Management (CLI Procedure) on page 14

List of Sample Output

show oam ethernet link-fault-management brief on page 58
show oam ethernet link-fault-management detail on page 58

Output Fields

Table 4 on page 54 lists the output fields for the **show oam ethernet link-fault-management** command. Output fields are listed in the approximate order in which they appear.

Table 4: show oam ethernet link-fault-management Output Fields

Field Name	Field Description	Level of Output
Status	Indicates the status of the established link. • **Fail**—A link fault condition exists. • **Running**—A link fault condition does not exist.	All levels
Discovery state	State of the discovery mechanism: • **Passive Wait** • **Send Any** • **Send Local Remote** • **Send Local Remote Ok**	All levels
Peer address	Address of the OAM peer.	All levels

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Table 4: show oam ethernet link-fault-management Output Fields (continued)

Field Name	Field Description	Level of Output
Flags	Information about the interface. • **Remote-Stable**—Indicates remote OAM client acknowledgment of, and satisfaction with local OAM state information. **False** indicates that remote DTE has either not seen or is unsatisfied with local state information. **True** indicates that remote DTE has seen and is satisfied with local state information. • **Local-Stable**—Indicates local OAM client acknowledgment of, and satisfaction with remote OAM state information. **False** indicates that local DTE either has not seen or is unsatisfied with remote state information. **True** indicates that local DTE has seen and is satisfied with remote state information. • **Remote-State-Valid**—Indicates the OAM client has received remote state information found within Local Information TLVs of received Information OAM PDUs. **False** indicates that OAM client has not seen remote state information. **True** indicates that the OAM client has seen remote state information.	All levels
Remote loopback status	Indicates the remote loopback status. An OAM entity can put its remote peer into loopback mode using the Loopback control OAM PDU. In loopback mode, every frame received is transmitted back on the same port (except for OAM PDUs, which are needed to maintain the OAM session).	All levels
Remote entity information	Remote entity information. • **Remote MUX action**—Indicates the state of the multiplexer functions of the OAM sublayer. Device is forwarding non-OAM PDUs to the lower sublayer or discarding non-OAM PDUs. • **Remote parser action**—Indicates the state of the parser function of the OAM sublayer. Device is forwarding non-OAM PDUs to higher sublayer, looping back non-OAM PDUs to the lower sublayer, or discarding non-OAM PDUs. • **Discovery mode**—Indicates whether discovery mode is active or inactive. • **Unidirectional mode**—Indicates the ability to operate a link in a unidirectional mode for diagnostic purposes. • **Remote loopback mode**—Indicates whether remote loopback is supported or not supported. • **Link events**—Indicates whether interpreting link events is supported or not supported on the remote peer. • **Variable requests**—Indicates whether variable requests are supported or not supported. The Variable Request OAM PDU, is used to request one or more MIB variables from the remote peer.	All levels
OAM Receive Statistics		
Information	The number of information PDUs received.	**detail**
Event	The number of loopback control PDUs received.	**detail**
Variable request	The number of variable request PDUs received.	**detail**
Variable response	The number of variable response PDUs received.	**detail**
Loopback control	The number of loopback control PDUs received.	**detail**

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Table 4: show oam ethernet link-fault-management Output Fields (continued)

Field Name	Field Description	Level of Output
Organization specific	The number of vendor organization specific PDUs received.	**detail**
OAM Transmit Statistics		
Information	The number of information PDUs transmitted.	**detail**
Event	The number of event notification PDUs transmitted.	**detail**
Variable request	The number of variable request PDUs transmitted.	**detail**
Variable response	The number of variable response PDUs transmitted.	**detail**
Loopback control	The number of loopback control PDUs transmitted.	**detail**
Organization specific	The number of vendor organization specific PDUs transmitted.	**detail**
OAM Received Symbol Error Event information		
Events	The number of symbol error event TLVs that have been received after the OAM sublayer was reset.	**detail**
Window	The symbol error event window in the received PDU. The protocol default value is the number of symbols that can be received in one second on the underlying physical layer.	**detail**
Threshold	The number of errored symbols in the period required for the event to be generated.	**detail**
Errors in period	The number of symbol errors in the period reported in the received event PDU.	**detail**
Total errors	The number of errored symbols that have been reported in received event TLVs after the OAM sublayer was reset. Symbol errors are coding symbol errors.	**detail**
OAM Received Frame Error Event Information		
Events	The number of errored frame event TLVs that have been received after the OAM sublayer was reset.	**detail**
Window	The duration of the window in terms of the number of 100 ms period intervals.	**detail**
Threshold	The number of detected errored frames required for the event to be generated.	**detail**
Errors in period	The number of detected errored frames in the period.	**detail**

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Table 4: show oam ethernet link-fault-management Output Fields (continued)

Field Name	Field Description	Level of Output
Total errors	The number of errored frames that have been reported in received event TLVs after the OAM sublayer was reset. A frame error is any frame error on the underlying physical layer.	**detail**
OAM Received Frame Period Error Event Information		
Events	The number of frame seconds errors event TLVs that have been received after the OAM sublayer was reset.	**detail**
Window	The duration of the frame seconds window.	**detail**
Threshold	The number of frame seconds errors in the period.	**detail**
Errors in period	The number of frame seconds errors in the period.	**detail**
Total errors	The number of frame seconds errors that have been reported in received event TLVs after the OAM sublayer was reset.	**detail**
OAM Transmitted Symbol Error Event Information		
Events	The number of symbol error event TLVs that have been transmitted after the OAM sublayer was reset.	**detail**
Window	The symbol error event window in the transmitted PDU.	**detail**
Threshold	The number of errored symbols in the period required for the event to be generated.	**detail**
Errors in period	The number of symbol errors in the period reported in the transmitted event PDU.	**detail**
Total errors	The number of errored symbols reported in event TLVs that have been transmitted after the OAM sublayer was reset.	**detail**
OAM Transmitted Frame Error Event Information		
Events	The number of errored frame event TLVs that have been transmitted after the OAM sublayer was reset.	**detail**
Window	The duration of the window in terms of the number of 100 ms period intervals.	**detail**
Threshold	The number of detected errored frames required for the event to be generated.	**detail**
Errors in period	The number of detected errored frames in the period.	**detail**
Total errors	The number of errored frames that have been detected after the OAM sublayer was reset.	**detail**

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Sample Output

show oam ethernet link-fault-management brief

```
user@host> show oam ethernet link-fault-management brief
Interface: ge-0/0/1
  Status: Running, Discovery state: Send Any
  Peer address: 00:90:69:72:2c:83
  Flags:Remote-Stable Remote-State-Valid Local-Stable 0x50
  Remote loopback status: Disabled on local port, Enabled on peer port
  Remote entity information:
    Remote MUX action: discarding, Remote parser action: loopback
    Discovery mode: active, Unidirectional mode: unsupported
    Remote loopback mode: supported, Link events: supported
    Variable requests: unsupported
```

show oam ethernet link-fault-management detail

```
user@host> show oam ethernet link-fault-management detail
  Interface: ge-0/0/1
    Status: Running, Discovery state: Send Any
    Peer address: 00:90:69:0a:07:14
    Flags:Remote-Stable Remote-State-Valid Local-Stable 0x50
    OAM receive statistics:
      Information: 186365, Event: 0, Variable request: 0, Variable response: 0
      Loopback control: 0, Organization specific: 0
    OAM transmit statistics:
      Information: 186347, Event: 0, Variable request: 0, Variable response: 0
      Loopback control: 0, Organization specific: 0
    OAM received symbol error event information:
      Events: 0, Window: 0, Threshold: 0
      Errors in period: 0, Total errors: 0
    OAM received frame error event information:
      Events: 0, Window: 0, Threshold: 0
      Errors in period: 0, Total errors: 0
    OAM received frame period error event information:
      Events: 0, Window: 0, Threshold: 0
      Errors in period: 0, Total errors: 0
    OAM transmitted symbol error event information:
      Events: 0, Window: 0, Threshold: 1
      Errors in period: 0, Total errors: 0
    OAM transmitted frame error event information:
      Events: 0, Window: 0, Threshold: 1
      Errors in period: 0, Total errors: 0
    Remote entity information:
      Remote MUX action: forwarding, Remote parser action: forwarding
      Discovery mode: active, Unidirectional mode: unsupported
      Remote loopback mode: supported, Link events: supported
      Variable requests: unsupported
```


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