



## CHAPTER 3

# Fault Management

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This chapter describes the following topics:

- [Overview of Polling and Thresholds](#)
- [Updating Polling Parameters and Thresholds](#)
- [Setting Priorities](#)
- [Threshold Configuration](#)
- [Managing Polling Parameters](#)
- [Applying Polling and Threshold Changes](#)
- [Configuring SNMP Trap Receiving and Forwarding](#)

These topics explain the process for configuring polling settings and threshold values for LMS.

## Overview of Polling and Thresholds

The centralized Grouping Services Administration organizes devices, device interfaces, and device ports into different groups. The LMS system-defined groups include groups such as Broadband Cable, Routers, Switches and Hubs, and so on.

These groups have specific polling and threshold settings, while the Broadband Cable device type has different polling and threshold settings. Since a device can belong to multiple groups, the devices use the polling and threshold settings of the overriding group.

This section contains the following topics:

- [Which Settings Are Applied to Devices, Ports, and Interfaces?](#)
- [Customizable Groups](#)
- [Selecting Groups](#)

The Polling and Threshold function creates its own corresponding groups based on LMS Device groups and Fault groups:

- Polling groups that determine how often group members are polled for data.
- Threshold groups that determine acceptable levels of performance and utilization for group members.

When group objects are polled and the data of an object shows that threshold values have been exceeded, or values have fallen below acceptable levels, LMS generates the appropriate events.

LMS is configured with factory settings (or defaults) for polling parameters and threshold values. You can use the factory settings, modify them, and restore them to factory settings at any time.

In many cases, it may be acceptable to use the factory settings for polling parameters. However, depending on how important a device group is, you can increase or decrease the polling interval to:

- Minimize the impact on the polled devices
- Enhance the resolution of the collected data

You can also enhance the performance and utilization of devices by adjusting thresholds. You need to consider:

- Location of the devices in the IP fabric
- Resource constraints

## Which Settings Are Applied to Devices, Ports, and Interfaces?

Every device, device port, and device interface belongs to at least one system-defined group. When a device belongs to several groups, LMS uses the settings of the overriding group.

The overriding group is the highest priority device group to which the device belongs. These topics provide more information on priorities:

- [Prioritizing Groups for Polling and Thresholds](#), lists default group priorities.
- [Setting Priorities for Polling and Threshold Groups](#), explains how to change group priorities.

For information on the groups to which you can apply polling or threshold settings, see these topics:

- [Which Polling Settings Are Applied?](#)
- [Which Threshold Settings Are Applied?](#)

## Which Polling Settings Are Applied?

You can set and apply polling parameters to device groups. You cannot do this for individual devices. When a device is polled, its ports and interfaces are also polled; therefore port and interface polling is controlled at the group level.

Every device belongs to at least one system-defined device group. See *Administration of Cisco Prime LAN Management Solution 4.1* for information about how devices are assigned to system-defined groups. If a device belongs to more than one group, LMS uses the polling settings of the overriding group (with the highest priority, as described in [Setting Priorities for Polling and Threshold Groups](#)).

## Which Threshold Settings Are Applied?

You can set and apply threshold parameters to device, interface, and port groups. When a device is polled, LMS compares the new data against the threshold settings. If a threshold value has been exceeded, or a value has fallen below acceptable levels, LMS generates the appropriate event.

If a device, port, or interface belongs to more than one group, LMS uses the threshold settings of the overriding group (the group you determine to have the highest priority, as described in [Viewing the Overriding Group—Examples](#)).

## Customizable Groups

Customizable groups are the only user-defined groups for which you can set polling and threshold parameters. They are provided so you can create groups that fit your needs. LMS provides 28 customizable groups, which are divided into four categories:

- Access Port Groups
- Trunk Port Groups
- Interface Groups
- Device Groups

Table 3-1 lists the seven customizable groups that appear in each of the four categories.

**Table 3-1**      **Polling and Thresholds: Customizable Groups**

Customizable Groups	Intended Use
A	Consider reserving customizable groups A, B, and C to troubleshoot Add one device to any of these groups when you need to test. For example, to test a changed threshold or interval value for a polling setting.
B	
C	
1	Consider using customizable groups 1, 2, 3, and 4 when you want to override polling settings and thresholds for more than one device.
2	
3	
4	

You configure a customizable group to have the highest priority. To do so, see [Setting Priorities for Polling and Threshold Groups](#). You must add devices to the customizable groups before you can set polling parameters or threshold values for them. To do so, see *Administration of Cisco Prime LAN Management Solution 4.1*.

## Selecting Groups

When you use polling and threshold options, you must first select a group. If you want to view parameters, you can select any group. If you want to edit parameters or restore them to factory settings, you must select a group for which parameters exist.

Table 3-5 lists groups in the order in which they are displayed in the group selector and notes whether applicable parameters exist for the group. The group selector you see may not display all of the device groups listed in this table.

- System-defined groups are displayed in the polling and thresholds user interface when they have members.
- Customizable groups are displayed in the polling and thresholds user interface when a rule has been applied to them (using Group Administration).

**Table 3-2** Device Groups as Displayed in the Device Selector

Device Groups in Display Order	Parameters to Set
<i>CS@server</i>	None
System Defined Groups	None
Broadband Cable	Polling and thresholds
Cisco Interfaces and Modules	Polling and thresholds
Content Networking	Polling and thresholds
DSL and Long Reach Ethernet (LRE)	Polling and thresholds
Network Management	Thresholds
Optical Networking	Polling and thresholds
Routers	Polling and thresholds
Security and VPN	Polling and thresholds
Server Fabric Switches	Polling and thresholds
Storage Networking	Polling and thresholds
Switches and Hubs	Polling and thresholds
Server Fabric Switches	Polling and thresholds
Universal Gateways and Access Servers	Polling and thresholds
Voice and Telephony	Polling and thresholds
Wireless	Polling and thresholds
<i>DFM@server</i>	None
System Defined Groups	None
Access Port Groups	None
1GB Ethernet	Thresholds
10GB Ethernet	Thresholds
10MB-100MB Ethernet	Thresholds
ATM	Thresholds
Others	Thresholds
Interface Groups	None
1GB Ethernet	Thresholds
10GB Ethernet	Thresholds
10MB-100MB Ethernet	Thresholds
ATM	Thresholds
Backup	Thresholds
Dial-on-Demand	Thresholds
FDDI	Thresholds
ISDN B Channel	Thresholds
ISDN D Channel	Thresholds
ISDN Physical Interface	Thresholds

**Table 3-2** *Device Groups as Displayed in the Device Selector (continued)*

<b>Device Groups in Display Order</b>	<b>Parameters to Set</b>
Others	Thresholds
Serial	Thresholds
Token Ring	Thresholds
Trunk Port Groups	None
1GB Ethernet	Thresholds
10GB Ethernet	Thresholds
10MB-100MB Ethernet	Thresholds
ATM	Thresholds
Others	Thresholds
User Defined Groups	None
Customizable Groups	None
Customizable Access Port Groups	None
Customizable Group A	Thresholds
Customizable Group B	Thresholds
Customizable Group C	Thresholds
Customizable Group 1	Thresholds
Customizable Group 2	Thresholds
Customizable Group 3	Thresholds
Customizable Group 4	Thresholds
Customizable Groups	None
Customizable Group A	Polling and thresholds
Customizable Group B	Polling and thresholds
Customizable Group C	Polling and thresholds
Customizable Group 1	Polling and thresholds
Customizable Group 2	Polling and thresholds
Customizable Group 3	Polling and thresholds
Customizable Group 4	Polling and thresholds
Customizable Interface Groups	None
Customizable Group A	Thresholds
Customizable Group B	Thresholds
Customizable Group C	Thresholds
Customizable Group 1	Thresholds
Customizable Group 2	Thresholds
Customizable Group 3	Thresholds
Customizable Group 4	Thresholds
Customizable Trunk Port Groups	None

**Table 3-2** *Device Groups as Displayed in the Device Selector (continued)*

<b>Device Groups in Display Order</b>	<b>Parameters to Set</b>
Customizable Group A	Thresholds
Customizable Group B	Thresholds
Customizable Group C	Thresholds
Customizable Group 1	Thresholds
Customizable Group 2	Thresholds
Customizable Group 3	Thresholds
Customizable Group 4	Thresholds

For additional information, see the following topics:

- [Viewing Polling Parameters](#)
- [Previewing Polling Parameters](#)
- [Editing Polling Parameters](#)
- [Viewing Thresholds](#)
- [Previewing Thresholds](#)
- [Editing Thresholds](#)

# Updating Polling Parameters and Thresholds

This topic explains how to update polling parameters and thresholds, and provides links to the related procedures.

LMS is preconfigured with factory settings for polling parameters and thresholds for each system-defined group of devices. You can make the following changes:

- Update the polling parameters and thresholds for system-defined groups.
- Restore polling parameters and thresholds to factory settings.
- Add devices to one or more of seven predefined customizable groups and edit their polling parameters and thresholds.

The following table describes the basic process for updating polling parameters and thresholds.

Task	Procedures
<b>Step 1</b> If you are working with a customizable group, you may need to attend to the following tasks first: <ol style="list-style-type: none"> <li>Add devices to the customizable group. By default, no devices belong to customizable groups.</li> <li>(Optional) Set the priority of the customizable group.  By default, customizable groups have a lower priority than system-defined groups. However, you may want to change the priority.</li> </ol>	<ul style="list-style-type: none"> <li>• <a href="#">Editing and Creating Groups</a>. See the <i>Administration of Cisco Prime LAN Management Solution 4.1</i> document for details.</li> <li>• <a href="#">Setting Priorities for Polling and Threshold Groups</a></li> </ul>
<b>Step 2</b> Change polling parameters for a device group  This device group can be either a LMS system-defined group or a customizable device group.	<ul style="list-style-type: none"> <li>• <a href="#">Editing Polling Parameters</a></li> <li>• <a href="#">Restoring Factory Setting Polling Parameters</a></li> </ul>
<b>Step 3</b> Change threshold parameters for any device, interface, or port group.	<ul style="list-style-type: none"> <li>• <a href="#">Managing Fault Thresholds</a></li> <li>• <a href="#">Restoring Factory Settings for Thresholds</a></li> </ul>
<b>Step 4</b> After completing all changes, select a time of low activity on the network to update the IP fabric with these changes. The new values will not be used until you apply your changes.	<ul style="list-style-type: none"> <li>• <a href="#">Applying Polling and Threshold Changes</a></li> </ul>

## Setting Priorities

This section explains the following topics:

- [Prioritizing Groups for Polling and Thresholds](#)
- [Viewing the Overriding Group—Examples](#)
- [Setting Priorities for Polling and Threshold Groups](#)
- [Setting Parameters for a Device, Interface, or Ports](#)

## Prioritizing Groups for Polling and Thresholds

Devices, ports, and interfaces can belong to multiple groups. Owing to this, LMS uses the highest priority group to which the device belongs to determine which polling and threshold parameters to use.

LMS prioritizes groups as shown in the following tables, with groups in descending order of priority.

See the following tables for these details:

- [Access and Trunk Port Group Priorities for Thresholds](#)
- [Interface Groups Priorities for Thresholds](#)
- [Device Groups Priorities for Polling and Thresholds](#)

To find the overriding group for a device, you can select any device group to which the device belongs and view a Polling Parameter Summary or a Threshold Parameter Summary for the group.

A 10 GB Ethernet interface device, during an upgrade, behaves in the following ways:

- If the 10MB - 100MB group has been set to high priority when compared to 1 GB Ethernet group, then the 10GB device falls under the 10MB - 100MB group. In order to make it fall under 10 GB Ethernet Group, you must set the priority of the group to high.
- If the 10MB - 100MB group has been set to low priority when compared to 1 GB Ethernet group, then the 10GB device falls under 10 GB group.

For more information, see [Setting Priorities](#).

**Table 3-3 Access and Trunk Port Group Priorities for Thresholds**

Access and Trunk Port Groups in Priority Order	Parameters to Set
System Defined Groups	None
1 GB Ethernet	Threshold
10MB-100MB Ethernet	
10 GB Ethernet	
ATM	
Others	
User Defined Groups	None
Customizable Groups	None
Customizable Group A	Threshold
Customizable Group B	
Customizable Group C	
Customizable Group 1	Thresholds
Customizable Group 2	
Customizable Group 3	
Customizable Group 4	



**Table 3-4** *Interface Groups Priorities for Thresholds*

<b>Interface Groups in Priority Order</b>	<b>Parameters to Set</b>
System Defined Groups	None
1GB Ethernet	Thresholds
10MB-100MB Ethernet	Thresholds
10 GB Ethernet	Threshold
ATM	Threshold
Token Ring	Threshold
ISDN Physical Interface	Threshold
ISDN B Channel	Threshold
ISDN D Channel	Threshold
Serial	Threshold
FDDI	Threshold
Backup	Threshold
Dial-on-Demand	Threshold
Others	Threshold
User Defined Groups	None
Customizable Groups	None
Customizable Group A	Threshold
Customizable Group B	
Customizable Group C	
Customizable Group 1	Threshold
Customizable Group 2	
Customizable Group 3	
Customizable Group 4	

**Table 3-5** *Device Groups Priorities for Polling and Thresholds*

<b>Device Groups in Priority Order</b>	<b>Parameters to Set<sup>1</sup></b>
System Defined Groups	None
Security and VPN	Polling and thresholds
Content Networking	Polling and thresholds
Voice and Telephony	Polling and thresholds
Wireless	Polling and thresholds
Universal Gateways and Access Servers	Polling and thresholds
Broadband Cable	Polling and thresholds
Routers	Polling and thresholds
Storage Networking	Polling and thresholds

**Table 3-5** *Device Groups Priorities for Polling and Thresholds (continued)*

Device Groups in Priority Order	Parameters to Set <sup>1</sup>
Optical Networking	Polling and thresholds
Switches and Hubs	Polling and thresholds
Server Fabric Switches	Polling and thresholds
DSL and Long Reach Ethernet (LRE)	Polling and thresholds
Cisco Interfaces and Modules	Polling and thresholds
Network Management	Polling and thresholds
User Defined Groups	None
Customizable Groups	None
Customizable Group A	Polling and thresholds
Customizable Group B	
Customizable Group C	
Customizable Group 1	Polling and thresholds
Customizable Group 2	
Customizable Group 3	
Customizable Group 4	

1. A device can have different overriding polling and threshold groups.

For additional information, see the following topics:

- [Selecting Groups](#)
- [Viewing Polling Parameters](#)
- [Previewing Polling Parameters](#)
- [Viewing Thresholds](#)
- [Previewing Thresholds](#)
- [Prioritizing Groups for Polling and Thresholds](#)
- [Viewing the Overriding Group—Examples](#)
- [Setting Priorities for Polling and Threshold Groups](#)
- [Setting Parameters for a Device, Interface, or Ports](#)

## Viewing the Overriding Group—Examples

The Polling Parameter Summary and Threshold Parameter Summary pages provide information on the overriding groups for all devices in a specific group. The following procedures explain how to locate the overriding group for a port or interface:

- [Viewing the Overriding Polling or Threshold Group for a Device](#)
- [Viewing the Overriding Polling Group for a Port or Interface](#)

### Viewing the Overriding Polling or Threshold Group for a Device

Use the summary page to identify a device's overriding group.

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**Step 1** Select **Monitor > Fault Settings > Setup** from the menu.

**Step 2** Do either of the following:

- To view the overriding polling groups, select **Polling Parameters**.
- To view the overriding threshold group, select **Threshold Settings**.

A device can have different overriding polling and threshold groups.

For example, if you assign a router to use the settings from a customizable polling group, it would still use the settings from its original threshold group.

**Step 3** Select a device group and click **View**.

The appropriate summary page opens.

**Step 4** Locate the device in which you are interested, and check the Overriding Group column.

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### Viewing the Overriding Polling Group for a Port or Interface

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**Step 1** Select **Monitor > Fault Settings > Setup** from the menu.

**Step 2** Consider the port or interface type and check the appropriate system-defined group for that type, and select **Threshold Settings**.

**Step 3** Select the port or interface group and click **View**.

For example, if an interface is in the 10MB-100MB Ethernet interface group, select Managing Thresholds, choose that group, click **View**. [Table 3-1](#) appears.

**Step 4** Click **View Interfaces**.

A complete list of interfaces is displayed. If you were searching for a port, the link would be **View Ports**.

- If the interface or port appears as a member, that group is the overriding group. (Ports and interfaces are only listed as members in the overriding group.)
  - If the interface or port does not appear, repeat this process for all of the customizable groups until you locate the port or interface.
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- [Viewing Polling Parameters](#)
- [Previewing Polling Parameters](#)
- [Viewing Thresholds](#)
- [Previewing Thresholds](#)

## Setting Priorities for Polling and Threshold Groups

System-defined groups have a higher priority than customizable groups, but you can change the priorities as needed. This is helpful, for example, when you configure specific customizable groups of interest and want to give them the highest priority.

For information on how to view the overriding group for devices, ports and interfaces, see [Viewing the Overriding Group—Examples](#).

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**Step 1** Select **Monitor > Fault Settings > Setup > Priority Settings** from the menu.

The Setting Priorities page appears, displaying the groups in priority order.

**Step 2** Activate the radio button that corresponds to the group type, one of the following:



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**Note** A device can have different overriding polling and threshold groups.

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- Polling groups: Device Polling Groups
- Threshold groups:
  - Device Threshold Groups
  - Interface Threshold Groups
  - Access Port Threshold Groups
  - Trunk Port Threshold Groups

**Step 3** Rearrange the groups according to your preference (the closer the group is to the top of the list, the higher its priority):

- a. Select a group.
- b. Move the group up or down using the arrows.

**Step 4** Click **Save** to save the changes.



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**Note** The changes do not take effect until you apply them to LMS. See [Applying Polling and Threshold Changes](#).

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## Setting Parameters for a Device, Interface, or Ports

There are several ways in which you can control the parameters for a device, interface, or port. Polling and thresholds are always applied on a group level, not on a specific device, port, or interface level.

**Note**

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Be careful when you change settings for a system-defined group. Your changes will affect the settings of all devices in the group.

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To apply settings to a device or component that belongs to multiple groups, make sure the group with the desired settings is the overriding group (has the highest priority), as described in [Setting Priorities](#).

To configure polling and threshold settings for a device:

- Adjust the polling and threshold settings for the LMS system-defined group to which the device belongs. If needed, you can verify the overriding group. This changes the settings for all devices in that system-defined group.
- Edit a customizable device group, apply the desired polling and threshold settings to the group, and verify the overriding group. In this way, you can create a group of specific devices that you need and specify settings for them.

To configure polling on interfaces and ports:

- Adjust the polling settings defined by the LMS system-defined group. If needed, you can verify the overriding group. This changes the polling settings for all interfaces and ports on devices in that system-defined group.
- Edit a customizable device group, apply the desired polling settings to the group, and verify the overriding group. In this way, only the ports and interfaces on specific devices are affected.

To configure thresholds on interfaces and ports:

- Adjust the threshold settings defined by the LMS system-defined port or interface group. If needed, you can verify the overriding group.

Make sure the port or interface belongs to that group, as described in [Viewing the Overriding Polling Group for a Port or Interface](#).) This changes the threshold settings for all interfaces and ports in that system-defined group.

- Edit a customizable interface or port group, apply the desired threshold settings, and verify the overriding group. In this way, only the ports and interfaces on specific devices are affected.

For additional information see:

- [Editing Polling Parameters](#)
- [Editing Thresholds](#)

# Threshold Configuration

See [Managing Fault Thresholds](#) for information on configuring and managing fault thresholds.

## Managing Polling Parameters

To manage polling parameters, select **Monitor > Fault Settings > Setup > Polling Parameters** from the menu. This feature allows you to perform the following tasks:

- [Viewing Polling Parameters](#)
- [Previewing Polling Parameters](#)
- [Editing Polling Parameters](#)
- [Restoring Factory Setting Polling Parameters](#)
- [Device Polling Settings](#)

You can adjust polling parameters only on devices. Port and interface polling is controlled at the device level. Therefore, you can adjust polling for these devices and groups:

- All devices managed by LMS
- LMS System Defined Groups
- LMS Customizable Groups (for devices)

## Viewing Polling Parameters

When you view polling parameters, you can see the devices that are members of the device group, and you can see the factory setting as well as current values for the polling parameters.

Devices that belong to multiple groups use the polling settings of the overriding group. Interface and port polling is controlled at the device level.

This means that switches have a specific polling setting. This setting determines when the switch ports are polled.

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**Step 1** Select **Monitor > Fault Settings > Setup > Polling Parameters** from the menu.

**Step 2** Select any device group from the group selector.

See [Selecting Groups](#) for a list of such device groups.

**Step 3** Click the View button.

The Polling Parameter Summary tabular display opens in a separate window. This window displays the following:

Field	Explanation
Group Name	Name of the device group selected.
Device Type	Device function.

Field	Explanation
Polling Parameters	<ul style="list-style-type: none"> <li>Parameter—Name of the polling setting to which the values apply.</li> <li>Interval (sec)—Factory setting for number of seconds between successive polls for the setting.</li> <li>New Interval (sec)—Current number of seconds between successive polls for the setting.</li> <li>Timeout (msec)—Factory setting for number of milliseconds before a poll request times out.</li> <li>New Timeout (msec)—Current number of milliseconds before a poll request times out.</li> <li>Retry —Factory setting for the number of times to retry a failed poll request.</li> <li>New Retry —Current number of times to retry a failed poll request.</li> <li>Enabled—Whether polling is enabled (True) or disabled (False).</li> <li>Overriding Group—Device group from which polling parameter values are applied. (This is the highest priority device group to which the device belongs.)</li> </ul> <p>If you want to change the polling parameters for a device, you can edit the settings for the overriding group. See <a href="#">Editing Polling Parameters</a>.</p>

**Step 4** After viewing the polling parameters, close the tabular display.

For additional information, see [Viewing the Overriding Group—Examples](#).

## Previewing Polling Parameters

When you preview polling parameters, you can see the edited polling parameters before you apply the changes.



**Note** Preview is supported only for Device Type Groups.

**Step 1** Select **Monitor > Fault Settings > Setup > Polling Parameters** from the menu.

**Step 2** Select any device group from the group selector.

**Step 3** Click the Preview button.

The Polling Parameter Summary tabular display opens in a separate window. This window displays the following:

Field	Explanation
Group Name	Name of the device group selected.
Device Type	Device function.

Field	Explanation
Polling Parameters	<ul style="list-style-type: none"> <li>Parameter—Name of the polling setting to which the values apply.</li> <li>Interval (sec)—Factory setting for number of seconds between successive polls for the setting.</li> <li>New Interval (sec)—Current number of seconds between successive polls for the setting.</li> <li>Timeout (msec)—Factory setting for number of milliseconds before a poll request times out.</li> <li>New Timeout (msec)—Current number of milliseconds before a poll request times out.</li> <li>Retry —Factory setting for number of times to retry a failed poll request.</li> <li>New Retry —Current number of times to retry a failed poll request.</li> <li>Enabled—Whether polling is enabled (True) or disabled (False).</li> <li>Overriding Group—Device group from which polling parameter values are applied. (This is the highest priority device group to which the device belongs.)</li> </ul>

**Step 4** After previewing the polling parameters, close the tabular display.

The Polling Parameter Summary report displays the edited parameters for the selected device group. You can see the preview of the edited parameters based on the grouping of the devices in the selected device group.

#### Previewing Polling Parameters — Example

The following example will help you to understand the preview of the displayed edited polling parameters:

Let us consider the devices D1, D2, D3, and D4 belonging to the following four groups:

- Routers: D1 and D2
- Switches and Hubs: D2 and D3
- Customizable Group1: D1 and D3
- Customizable Group 2: D2 and D4

Let the Overriding Group order of the groups be:

- Customizable Group1
- Routers
- Switches and Hubs
- Customizable Group 2

Let the Environment Settings parameter for the groups be:

- Routers: 200
- Switches and Hubs: 300
- Customizable Group1: 400



- Customizable Group 2: 500

To edit the parameter Environment Settings of a device group and to see the preview, do the following:

- 
- Step 1** Select **Routers** that contain D1 and D2
- Step 2** Edit the Environment Settings by changing it to 800
- Step 3** Click the Preview button to see the edited parameters
- The Polling Parameter Summary report for Routers (D1 and D2) is displayed.
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The edited Environment Settings value 800 will be displayed only against the device D2.

Although D2 belongs to the groups Routers, Switches and Hubs, and Customizable Group 2, Routers is the overriding group among them. Since D2 belongs to the overriding group Routers, the edited parameter 800 is displayed against D2.

D1 belongs to the groups Routers and Customizable Group1 where Customizable Group1 is the Overriding group. So instead of the edited value 800, the value 400 which belongs to Customizable Group1 will be displayed against D1.

For more information on Overriding Groups, see [Viewing the Overriding Group—Examples](#). To change the priority of the Device groups, see [Setting Priorities for Polling and Threshold Groups](#).

Although the polling parameters are saved in the database, they are not yet applied to the IP fabric. See [Applying Polling and Threshold Changes](#).

## Editing Polling Parameters

When you edit polling parameters, you edit settings that are associated with device groups, not with individual devices.

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- Step 1** Select **Monitor > Fault Settings > Setup > Polling Parameters** from the menu.
- Step 2** Select a device group for which you can set polling parameters.  
See [Selecting Groups](#) for a list of such device groups.
- Step 3** Click the Edit button.
- The Polling Parameters: Edit page appears, displaying the following information.

Field	Explanation
Parameters	The parameters for the selected device group are displayed, including: <ul style="list-style-type: none"> <li>• Current values for each setting</li> <li>• Whether values are the factory settings (Default check box selected)</li> <li>• Whether polling is enabled for the settings (Enabled check box selected)</li> </ul>

- Step 4** Change the parameters appropriately for each setting.
- Each setting controls how frequently devices are polled for a particular type of data; for example, reachability.

- To reset all settings to factory settings, select the Default check box in the table heading.
- To disable polling for all settings, deselect the Enabled check box in the table heading.
- To set parameters for individual settings, enter data for the following parameters for each setting.

Field	Description	Usage Notes
New Interval	Enter the number of seconds between successive polls for the setting. Maximum value: 3600 Minimum value: 30 Increment: 1	See <a href="#">Device Polling Settings</a> for the minimum interval for each polling setting.
New Timeout	Enter the number of milliseconds allowed for a poll request before it times out. Minimum value: 10 Maximum value: 60,000 Increment: 1	—
New Retry	Enter the number of times to retry a failed poll request. Minimum value: 0 Maximum value: 10 Increment: 1	—
Default	To reset the values for the setting, to the factory settings, select this check box. The Default check box in the table heading can override this setting.	To view factory settings, see <a href="#">Viewing Polling Parameters</a> .
Enabled	To disable polling for this setting, deselect this check box. To enable polling, select it. The Enabled check box in the table heading can override this setting.	—

**Step 5** To save the settings, either:

- Click **Save** to save the changes and display the Polling Parameters: Edit page again.

Or

- Click **OK** to save the changes and close the Polling Parameters: Edit page.

**Step 6** Click **Preview** to see the edited polling parameters before applying the changes.

The Polling Parameter Summary report displays the edited parameters for the selected device group. You can see the preview of the edited parameters based on the grouping of the devices in the selected device group. For more information, see the [Previewing Polling Parameters — Example](#) given in the Previewing Polling Parameters section.

## Restoring Factory Setting Polling Parameters

You can restore all parameter settings for a device group to factory settings using this procedure. If, instead, you want to restore only a few settings, see [Editing Polling Parameters](#).

### Before You Begin

To review the factory settings for polling parameters before you apply them, view the Polling Parameter Summary for the device group. See [Viewing Polling Parameters](#). Both current and factory settings displayed.

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- Step 1** Select **Monitor > Fault Settings > Setup > Polling Parameters** from the menu.
  - Step 2** Select a device group for which you can restore polling parameters. See [Selecting Groups](#) for a list of such device groups.
  - Step 3** Click the **Factory Setting**.  
A confirmation dialog box appears.
  - Step 4** Click **Yes**.  
The settings are stored in the database, but not yet applied to the IP fabric. See [Applying Polling and Threshold Changes](#).
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## Device Polling Settings

lists the polling settings that are applicable to each device group (or type), along with the minimum and maximum polling interval for each setting.

The minimum interval is usually lower than the factory setting provided by LMS. See [Viewing Polling Parameters](#), to obtain information about how to open a Polling Parameter Summary, which lists the factory settings for polling parameter values.

This section also describes the minimum and maximum values for Interval, Timeout, and Retry parameters.

Table 3-6 Polling Settings for Device Groups (Device Types)

Device Group Type (Device Type) <sup>1</sup>	Polling Settings	Interval (in seconds)	Timeout	Retry	
<ul style="list-style-type: none"> <li>• Broadband Cable</li> <li>• Cisco Interfaces and Modules</li> <li>• Content Networking</li> <li>• DSL and Long Reach Ethernet (LRE)</li> <li>• Optical Networking</li> <li>• Routers</li> <li>• Security and VPN</li> <li>• Server Fabric Switches</li> <li>• Storage Networking</li> <li>• Switches and Hubs</li> <li>• Universal Gateways and Access Servers</li> <li>• Voice and Telephony</li> <li>• Wireless</li> </ul>	Reachability settings	240	700	3	
	Processor and memory utilization	240	700	3	
	Environment	240	700	3	
	Connector port and interface	240	700	3	
	Access port	1200	700	3	
	Network Management	Reachability settings	240	700	3
	Connector and port interface	240	700	3	
	Access port	1200	700	3	

1. All polling intervals have a minimum of 30 seconds and a maximum of 3600 seconds.

# Applying Polling and Threshold Changes

**Note**

Your login determines whether you can perform this operation.

Changes to polling parameters and threshold values do not take effect until you apply changes, thereby reconfiguring LMS to use the new values.

The following explains the difference between saving your changes and applying your changes.

When you save changes, LMS performs the following tasks:

- Sets the polling and threshold settings of devices in the selected device group.
- Sets the overriding group, based on the priorities of the groups to which devices belong.

When you apply changes, LMS:

- Recalculates group membership, based on group priority.
- Uses the new polling and threshold settings to gather information from the devices.

Similarly, after you resume devices or device components that were suspended from polling, you must apply changes for the device elements to be polled.

**Before You Begin**

Applying changes is a CPU-intensive event that may take between one and five minutes to complete. Therefore, to minimize system impact, consider doing the following when possible:

- Consolidating changes to polling parameters and threshold values, thereby limiting the number of times you will need to apply them.
- Applying changes during a low-usage time.

To apply the polling and threshold changes:

---

**Step 1** Select **Monitor > Fault Settings > Setup > Apply Changes** from the menu.

The Apply Changes page appears.

**Step 2** Click **Yes** to apply the changes:

- If another user has already initiated applying changes, a message is displayed and changes are not applied again.
- If, since the last time changes were applied, polling parameter settings or threshold values have not changed and devices have not been suspended and then resumed, changes will not be applied.

**Tip**

You cannot directly verify that changes have been applied. However, you can do so indirectly. For example, in response to an event, you change a threshold value and apply changes. After LMS finishes applying changes, you can see whether LMS clears the event.

# Configuring SNMP Trap Receiving and Forwarding

LMS can receive traps on any available port and forward them to a list of devices and ports. This capability enables LMS to work with other trap processing applications.

This section contains the following topics:

- [Enabling Devices to Send Traps to LMS](#)
- [Integrating SNMP Trap Receiving with Other Trap Daemons or NMSs](#)
- [Updating the SNMP Trap Receiving Port](#)
- [Configuring SNMP Trap Forwarding](#)

LMS will only forward SNMP traps from devices in the LMS inventory.

It will not change the trap format—it will forward the raw trap in the format in which the trap was received from the device. However, you must enable SNMP on your devices and you must do one of the following:

- Configure SNMP to send traps directly to LMS
- Integrate SNMP trap receiving with an NMS or a trap daemon

The versions of SNMP traps supported by LMS are described in [Polling—SNMP and ICMP](#). For information on forwarding processed and pass-through traps, see [Processing SNMP Traps](#).

**Note**

---

The ports and protocols used by LMS are listed in the Installing and Migrating to Cisco Prime LAN Management Solution 4.1 document.

---

## Enabling Devices to Send Traps to LMS

**Note**

---

If your devices send SNMP traps to a Network Management System (NMS) or a trap daemon, see [Integrating SNMP Trap Receiving with Other Trap Daemons or NMSs](#).

---

Since LMS uses SNMP MIB variables and traps to determine device health, you must configure your devices to provide this information. For any Cisco device that you want LMS to monitor, SNMP must be enabled and the device must be configured to send SNMP traps to the LMS server.

Make sure your devices are enabled to send traps to LMS by using the command line or GUI interface appropriate for your device.

This section explains:

- [Enabling Cisco IOS-Based Devices to Send Traps to LMS](#)
- [Enabling Catalyst Devices to Send SNMP Traps to LMS](#)

## Enabling Cisco IOS-Based Devices to Send Traps to LMS

For devices running Cisco IOS software, enter the following commands:

```
(config)# snmp-server [community string] ro
(config)# snmp-server enable traps
(config)# snmp-server host [a.b.c.d] traps [community string]
```

where *[community string]* indicates an SNMP read-only community string and *[a.b.c.d]* indicates the SNMP trap receiving host (the LMS server).

For more information, see the appropriate command reference guide.

- 
- Step 1** Log into Cisco.com.
  - Step 2** Select **Products & Services > Cisco IOS Software**.
  - Step 3** Select the Cisco IOS software release version used by your IOS-based devices.
  - Step 4** Select **Technical Documentation** and select the appropriate command reference guide.
- 

## Enabling Catalyst Devices to Send SNMP Traps to LMS

For devices running Catalyst software, provide the following commands:

```
(enable)# set snmp community read-only [community string]
(enable)# set snmp trap enable all
(enable)# set snmp trap [a.b.c.d] [community string]
```

where *[community string]* indicates an SNMP read-only community string and *[a.b.c.d]* indicates the SNMP trap receiving host (the LMS server).

For more information, see the appropriate command reference guide.

- 
- Step 1** Log into Cisco.com.
  - Step 2** Select **Products & Services > Cisco Switches**.
  - Step 3** Select the appropriate Cisco Catalyst series switch.
  - Step 4** Select **Technical Documentation** and select the appropriate command reference guide.
-

## Integrating SNMP Trap Receiving with Other Trap Daemons or NMSs

You might need to complete one or more of the following steps to integrate SNMP trap receiving with other trap daemons and other Network Management Systems (NMSs):

- If you are integrating LMS with a remote version of HP OpenView or NetView, you must install the appropriate adapter on the remote HP OpenView or NetView (see *Installing and Migrating to Cisco Prime LAN Management Solution 4.1*. This guide also provides information on supported versions). You do not need to install any adapters if HP OpenView or NetView is installed locally.
- Add the host where LMS is running to the list of trap destinations in your network devices. See [Enabling Devices to Send Traps to LMS](#). Specify port 162 as the destination trap port. (If another NMS is already listening for traps on the standard UDP trap port (162), use port 9000, which LMS will use by default.)
- If your network devices are already sending traps to another management application, configure that application to forward traps to LMS.

Table 3-7 describes scenarios for SNMP trap receiving and lists the advantages of each.

**Table 3-7 Configuration Scenarios for Trap Receiving**

Scenario	Advantages
Network devices send traps to port 162 of the host where LMS is running. LMS receives the traps and forwards them to the NMS.	<ul style="list-style-type: none"> <li>• No reconfiguration of the NMS is required.</li> <li>• No reconfiguration of network devices is required.</li> <li>• LMS provides a reliable trap reception and forwarding mechanism.</li> <li>• NMS continues to receive traps on port 162.</li> <li>• Network devices continue to send traps to port 162.</li> </ul>
NMS receives traps on default port 162 and forwards them to port 162 on the host where LMS is running.	<ul style="list-style-type: none"> <li>• No reconfiguration of the NMS is required.</li> <li>• No reconfiguration of network devices is required.</li> <li>• LMS does not receive traps dropped by the NMS.</li> </ul>

## Updating the SNMP Trap Receiving Port

By default, LMS receives SNMP traps on port 162 (or, if port 162 is occupied, port 9000). If you need to change the port, you can do so. LMS supports SNMP V1, V2, and V3 traps for trap receiving.

- 
- Step 1** Select **Monitor > Fault Settings > SNMP Traps > Receiving** from the menu.
- Step 2** Enter the port number in the Receiving Port entry box.
- Step 3** Click **Apply**.
- 

For a list of ports that are already in use, see *Installing and Migrating to Cisco Prime LAN Management Solution 4.1*. If you have two instances of the DfmServer process running, traps will be forwarded from the first instance to the second instance.



## Configuring SNMP Trap Forwarding

**Note**

Your login determines whether or not you can perform this task.

LMS will only forward SNMP traps from devices in the LMS inventory. LMS will not change the trap format—it will forward the raw trap in the format in which it was received from the device. All traps are forwarded in V1 (SNMP Version) format.

To configure SNMP Trap Forwarding:

- 
- Step 1** Select **Monitor > Fault Settings > SNMP Traps > Forwarding** from the menu.
- Step 2** For each host, enter:
- An IP address or DNS name for the hostname.
  - A port number on which the host can receive traps.
  - A community string. The default value is public.
- Step 3** Click **Apply**.
- 

For additional information, see [Processed SNMP Traps](#), [Pass-Through SNMP Unidentified Traps](#), and [Unidentified Traps](#).

## Viewing Fault Device Details

This section explains:

- [Fault Device Details](#)
- [Understanding the Detailed Device View](#)
- [Managing/Unmanaging a Single Device Component](#)
- [Performing Bulk Manage/Unmanage Operations](#)

## Fault Device Details

You can view the fault details of devices in LMS. To do so:

- 
- Step 1** Select **Monitor > Fault Settings > Setup > Fault Device Details** from the menu.
- The Fault Device Details page appears.
- Step 2** Select one or more devices from the device selector tree. You can also search for the devices using the simple and advanced search operations.

**Step 3** Click **View**.

The Device Details report appears.

Field	Description
Device Name	Fault Management display name of the device. Click this link to launch a Detailed Device View.
Device Type	Type of the device. Examples are Switches and Hubs, Cisco Interfaces and Modules, and so on.
IP Address	Device IP address.
Status	Current state of the device.
First Added	The first time the device was added into Fault Management.
Last Discovered	The time and date the device was last discovered.

To start a Detailed Device View for the device, click the Device Name link.

## Understanding the Detailed Device View

To understand the Detailed Device View, see the following topics:

- [Component Categories Pane](#)
- [System Information Pane](#)
- [Record Count](#)
- [Command Buttons Area](#)
- [Managing/Unmanaging a Single Device Component](#)

### Component Categories Pane

The component categories pane lists the components of the device: Environment, System, and Interface (what is shown depends on the device being viewed). The following are some examples of what you may see in these categories:

- Environment: Temperature, fan, power supply, voltage information
- System: Hard disk, RAM, processor, memory information
- Interface: Interface, port, card information; IP addresses on the device



#### Note

Avoid using non US (eg.8 bit ASCII) characters in the description of an Interface. If you use these characters in an interface description, an error occurs when you try to change the managed state of a device in the Detailed Device View page.

From a Detailed Device View for an aggregate (containing) device, you can launch a Detailed Device View for the contained device. For example, for a router containing MSFCs, open a Detailed Device View for the router. From the router Detailed Device View, you can launch a new Detailed Device View for the MSFC.

### System Information Pane

The system information pane provides information such as the system name, IP address, SysObjectID, system contact, and so forth. The device type determines what is displayed by the Detailed Device View.

If the system information pane lists an attribute with no value, it is because of one of the following reasons:

- The attribute is not populated.
- The attribute is not configured correctly.
- The attribute does not apply to the device.

If the current view is of a parent (or containing) device—for example, a Catalyst 6513 switch with an MSFC card—the System Information Pane will contain a button, **Launch New DDV For This Device** button. If you click that button, a Detailed Device View for the MSFC is displayed.

You can suspend or resume device or component monitoring by clicking the Suspend or Resume button.

### Record Count

The record count lists the number of information types available on the device.

### Command Buttons Area

In addition to the Suspend and Resume buttons in the system information pane, the Command Button area provides other ways to respond to alerts.

**Table 3-8 Detailed Device View—Command Buttons**

Button	Action
Refresh	Refreshes the Detailed Device View page. (The Detailed Device View is not automatically refreshed; you must do so manually.)
Close	Closes the Detailed Device View page.

## Managing/Unmanaging a Single Device Component

You can unmanage or remanage device components using the Detailed Device View (cards, interfaces, ports, IP addresses, and so forth). If you unmanage a component, LMS will ignore subsequent events (including traps).



### Note

You cannot resume a device component if the parent device is suspended. You must resume the parent device first. If a parent device is suspended, the device components are also suspended.

- Step 1** From the device display, click a device in the Device Name column.  
The Detailed Device View opens.
- Step 2** Select the component with the instance you want to unmanage or manage.

**Step 3** Locate the instance you want to unmanage or manage, and make your change using the list in the ManagedState column.

Note that:

- You can change the unmanaged state of an IP component of a device to managed state, only if its underlying interface is in a managed state.
- You cannot change the state of a management IP because it is not displayed in the Detailed Device View page.
- You can place the cursor on Details to see the Interface/Port details of a specific device. This option is available only for Port and Interface components.
- You cannot unmanage the interface of the management IP. Its status is static and there is no option to unmanage it.

**Step 4** Click **Submit**.

If you resumed any devices (and you are finished making all of your monitoring status changes), select **Monitor > Fault Settings > Setup > Apply Changes** from the menu. This causes LMS to resume polling according to the polling and threshold settings for the device.

Since this action is CPU-intensive, wait until you have made all of your monitoring status changes before you apply them.

## Performing Bulk Manage/Unmanage Operations

You can use ASL scripts to perform bulk manage and unmanage operations of interfaces, ports, IP addresses, processors, and memory, as described in this topic. In these procedures you create and then edit a generated file so that it reflects the management state you want. Then you apply the change to the LMS inventory, so that LMS will use your new settings when gathering device information.

In the following procedures, *NMSROOT* represents the LMS installation directory. By default, these directories are:

- Solaris or Soft Appliance: /opt/CSCOpX
- Windows: C:\Progra~1\CSCOpX (which stands for C:\Program Files\CSCOpX)

### Managing Interfaces with ONDEMAND mode

Interfaces with ONDEMAND mode are not managed by default.

To manage them using the `dmct1` CLI command, enter:

```
get Ethernet_Performance_Setting:: "Thresholds setting group"
::AnalysisModeOfSubInterfacePerformance ENABLED
```

```
invoke ICF_PolicyManager::ICF-PolicyManager reconfigure
```

For example: `get Ethernet_Performance_Setting:: "SET-CFG-Interface Groups/1 Gb Ethernet/Ethernet_Performance_Setting" ::AnalysisModeOfSubInterfacePerformance ENABLED`

```
invoke ICF_PolicyManager::ICF-PolicyManager reconfigure
```