CHAPTER 8

Configuring RMON

RMON is an Internet Engineering Task Force (IETF) standard monitoring specification that allows various network agents and console systems to exchange network monitoring data. You can use the RMON alarms and events to monitor Cisco MDS 9000 Family switches running the Cisco SAN-OS Release 2.0(1b) or later or Cisco NX-OS Release 4.1(3) or later software.

This chapter includes the following sections:

About RMON

RMON allows various network agents and console systems to exchange network monitoring data. It is an Internet Engineering Task Force (IETF) standard monitoring specification. You can use the RMON alarms and events to monitor Cisco MDS 9000 Family switches running the Cisco SAN-OS Release 2.0(1b) or later, or Cisco NX-OS 4.1(1) software. RMON is disabled by default, and no events or alarms are configured in the switch.

All switches in the Cisco MDS 9000 Family support the following RMON functions (defined in RFC 2819):

- Alarm—Each alarm monitors a specific management information base (MIB) object for a specified interval. When the MIB object value exceeds a specified value (rising threshold), the alarm condition is set and only one event is triggered regardless of how long the condition exists. When the MIB object value falls below a certain value (falling threshold), the alarm condition is cleared. This allows the alarm to trigger again when the rising threshold is crossed again.
- Event—Determines the action to take when an event is triggered by an alarm. The action can be to generate a log entry, an SNMP trap, or both.

For agent and management information, see the *Cisco MDS 9000 Family MIB Quick Reference.*

For SNMP security-related CLI configurations, see the "About SNMP Security" section on page 9-1.

Configuring RMON Using Threshold Manager

RMON is disabled by default and no events or alarms are configured in the switch. You can configure your RMON alarms and events by using the CLI or by using Threshold Manager in Device Manager.

The Threshold Monitor allows you to trigger an SNMP event or log a message when the selected statistic goes over a configured threshold value. RMON calls this a rising alarm threshold. The configurable settings are as follows:

- Variable—The statistic you want to set the threshold value on.
- Value—The value of the variable that you want the alarm to trigger at. This value is the difference (delta) between two consecutive polls of the variable by Device Manager.
- Sample—The sample period (in seconds) between two consecutive polls of the variable. Select your sample period such that the variable does not cross the threshold value you set under normal operating conditions.
- Warning—The warning level used by Device Manager to indicate the severity of the triggered alarm. This is a Fabric Manager and Device Manager enhancement to RMON.

Note To configure any type of RMON alarm (absolute or delta, rising or falling threshold) click **More** on the Threshold Manager dialog box. You should be familiar with how RMON defines these concepts before configuring these advanced alarm types. Refer to the RMON-MIB (RFC 2819) for information on how to configure RMON alarms.

Note You must also configure SNMP on the switch to access RMON MIB objects.

RMON Alarm Configuration

Threshold Manager provides a list of common MIB objects to set an RMON threshold and alarm on. The alarm feature monitors a specific MIB object for a specified interval, triggers an alarm at a specified value (rising threshold), and resets the alarm at another value (falling threshold).

You can also set an alarm on any MIB object. The specified MIB must be an existing SNMP MIB object in standard dot notation (1.3.6.1.2.1.2.2.1.14.16777216 16 16777216 for ifInOctets.167772161616777216).

Use one of the following options to specify the interval to monitor the MIB variable (ranges from 1 to 4294967295 seconds):

- Use the **delta** option to test the change between samples of a MIB variable.
- Use the **absolute** option to test each MIB variable directly.
- Use the **delta** option to test any MIB objects that are counters.

The range for the **rising threshold** and **falling threshold** values is -2147483647 to 2147483647.

Caution The **falling threshold** must be less than the **rising threshold**.

You can optionally specify the following parameters:

- The event-number to trigger if the rising or falling threshold exceeds the specified limit.
- The owner of the alarm.

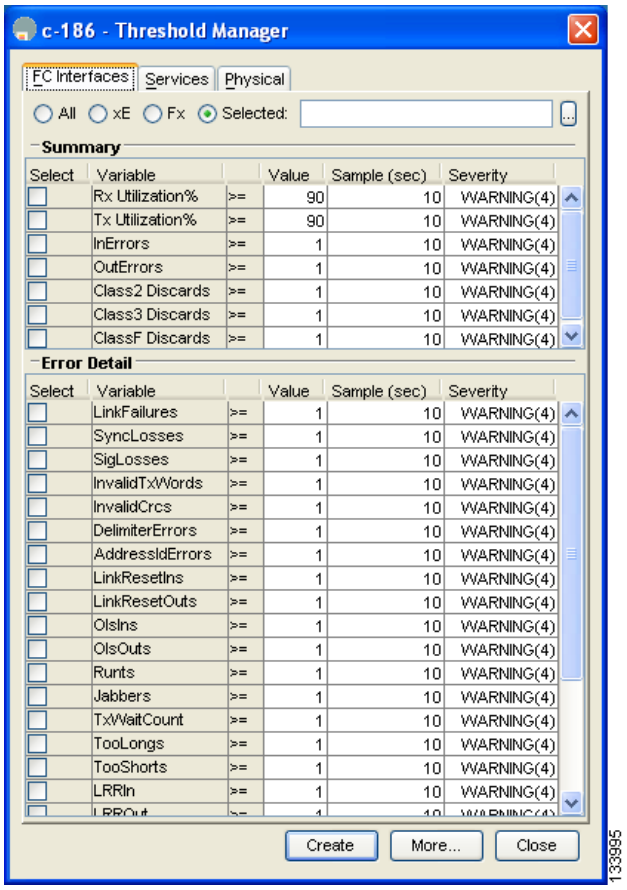
Enabling RMON Alarms by Port

To configure an RMON alarm for one or more ports using Device Manager, follow these steps:

Step 1 Choose **Admin > Events > Threshold Manager** and click the **FC Interfaces** tab.

You see the Threshold Manager dialog box (see Figure 8-1).

Figure 8-1 Threshold Manager Dialog Box



Step 2 Choose the **Select** radio button to select individual ports for this threshold alarm.

a. Click the **...** button to the right of the Selected field to display all ports.

b. Select the ports you want to monitor.

c. Click **OK** to accept the selection.

Alternatively, click the appropriate radio button to choose ports by type: **All** ports, **xE** ports, or **Fx** ports.

Step 3 Check the check box for each variable to be monitored.

Step 4 Enter the threshold value in the Value column.

Step 5 Enter the sampling period in seconds. This is the time between each snapshot of the variable.

Step 6 Choose one of the following severity levels to assign to the alarm: **Fatal**, **Warning**, **Critical**, **Error**, **Information.**

Step 7 Click **Create.**

Step 8 Confirm the operation to define an alarm and a log event when the system prompts you to define a severity event. If you do not confirm the operation, the system only defines a log event.

Step 9 Click **More** and then click the **Alarms** tab from the Threshold Manager dialog box to verify the alarm you created.

Step 10 Close both dialog box pop-up windows.

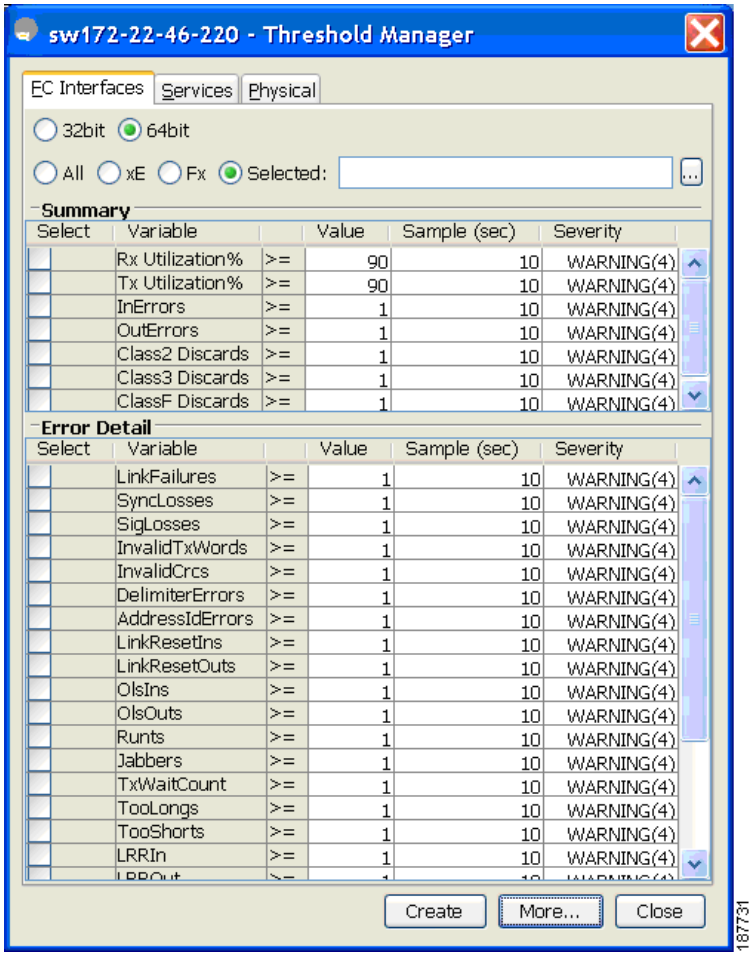
Enabling 32-Bit and 64-Bit Alarms

To configure an RMON alarm for one or more ports using Device Manager, follow these steps:

Step 1 Choose **Admin > Events > Threshold Manager** and click the **FC Interfaces > Create** tab.

You see the create 32-bit and 64-bit alarm dialog box (see Figure 8-2).

Figure 8-2 Create 32-Bit and 64-Bit Dialog Box



Step 2 Click the **Select** radio button to select individual ports for this threshold alarm.

a. Click the **...** button to the right of the Selected field to display all ports.

b. Select the ports you want to monitor.

c. Click **OK** to accept the selection.

Alternatively, click the appropriate radio button to choose ports by type: **All** ports, **xE** ports, or **Fx** ports.

Step 3 Check the check box for each variable to be monitored.

Step 4 Enter the threshold value in the Value column.

Step 5 Enter the sampling period in seconds. This is the time between each snapshot of the variable.

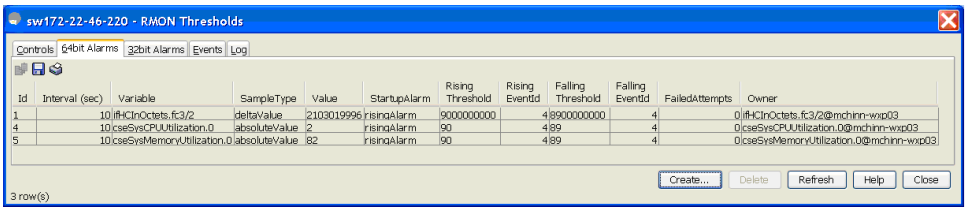
Step 6 Choose one of the following severity levels to assign to the alarm: **Fatal**, **Warning**, **Critical**, **Error**, **Information.**

Step 7 Click **Create.**

Step 8 Confirm the operation to define an alarm and a log event when the system prompts you to define a severity event. If you do not confirm the operation, the system only defines a log event.

Step 9 Click **More** and then click the **Alarms** tab from the Threshold Manager dialog box to verify the alarm you created. The 32-bit and 64-bit alarm Interval column show second as the unit.

Figure 8-3 RMON Threshold Dialog Box



Step 10 Close both dialog box pop-up windows.

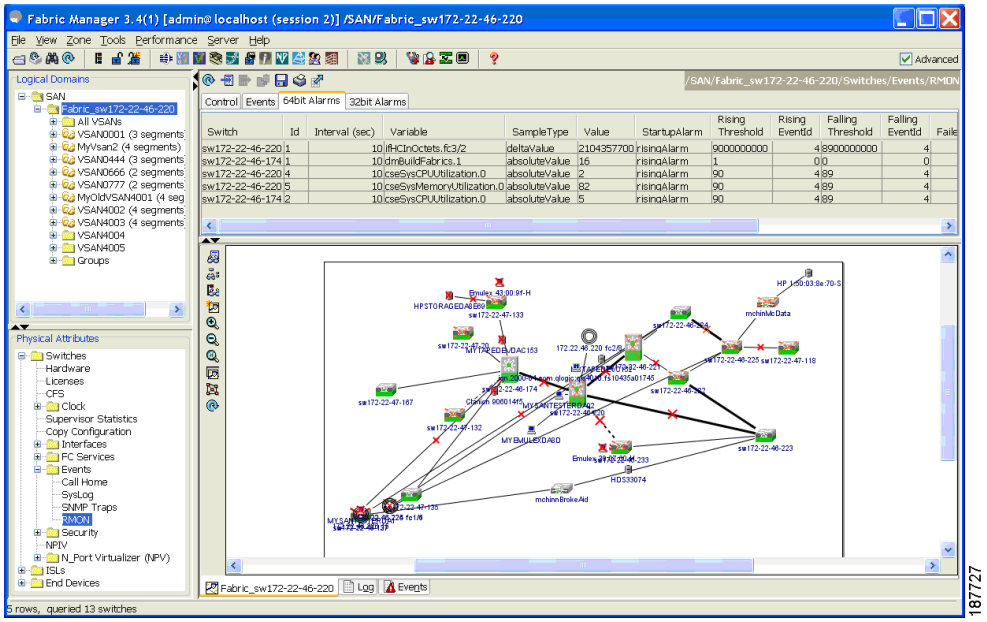
Create RMON Alarms in Fabric Manager

To create 64-bit RMON alarms using Fabric Manager, follow these steps:

Step 1 Choose **Physical Attributes > Events > RMON** tab.

You see the 64-bit alarm dialog box (see Figure 8-4).

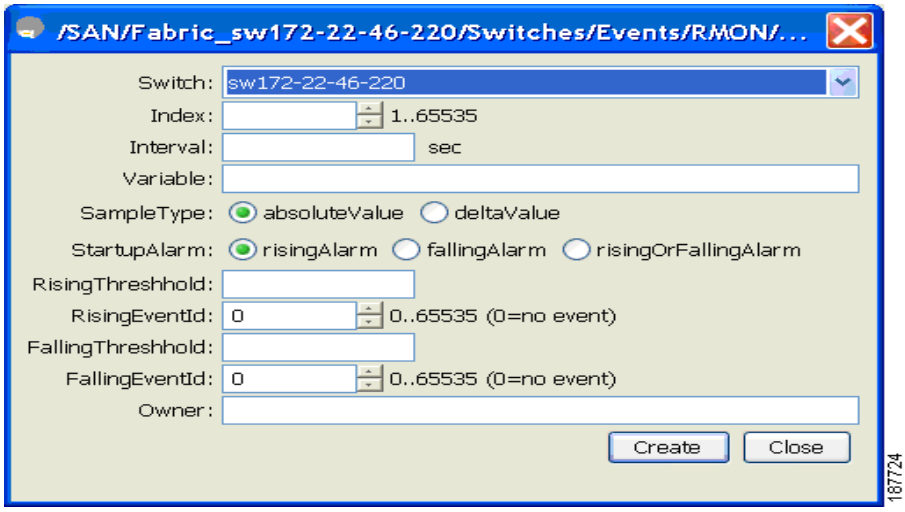
Figure 8-4 64-Bit Alarm Dialog Box



Step 2 Click the **64-bit alarms** tab.

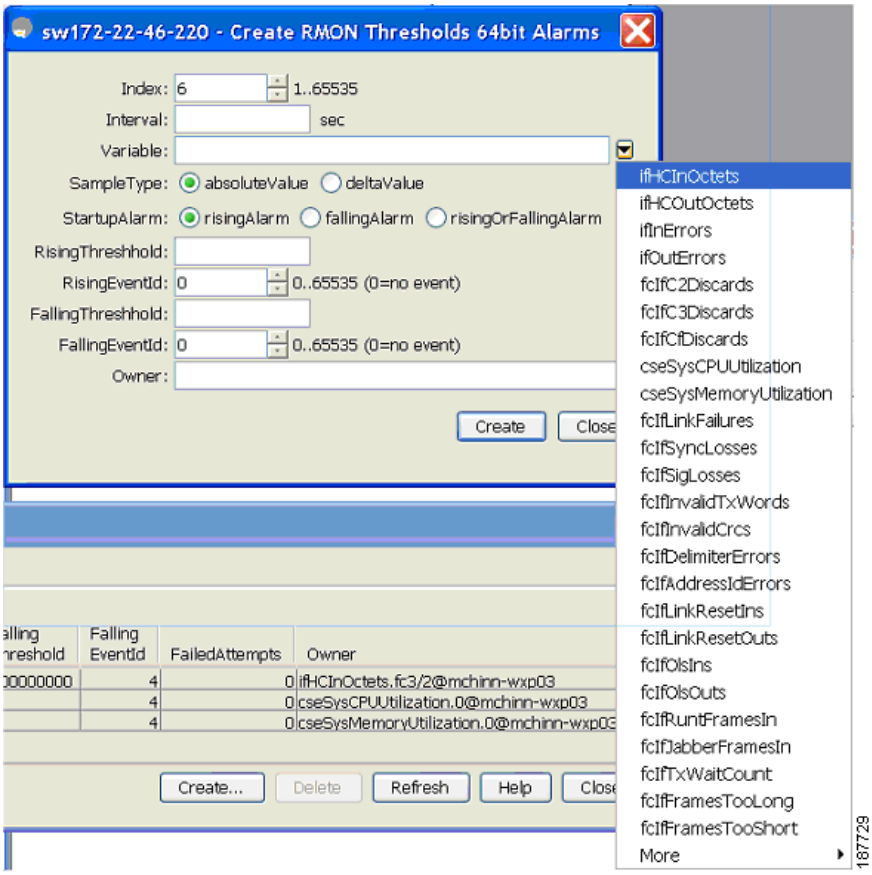
Step 3 Click the **Create Row** tab. You see the Create Row window (see Figure 8-5).

Figure 8-5 64-Bit Alarm Create Row Tab



Step 4 From the drop-down menu in the Variable field, choose from the list of MIB variables provided by the Threshold Manager (see Figure 8-6).

Figure 8-6 MIB Variable Field Dialog Box for 64-Bit Alarms



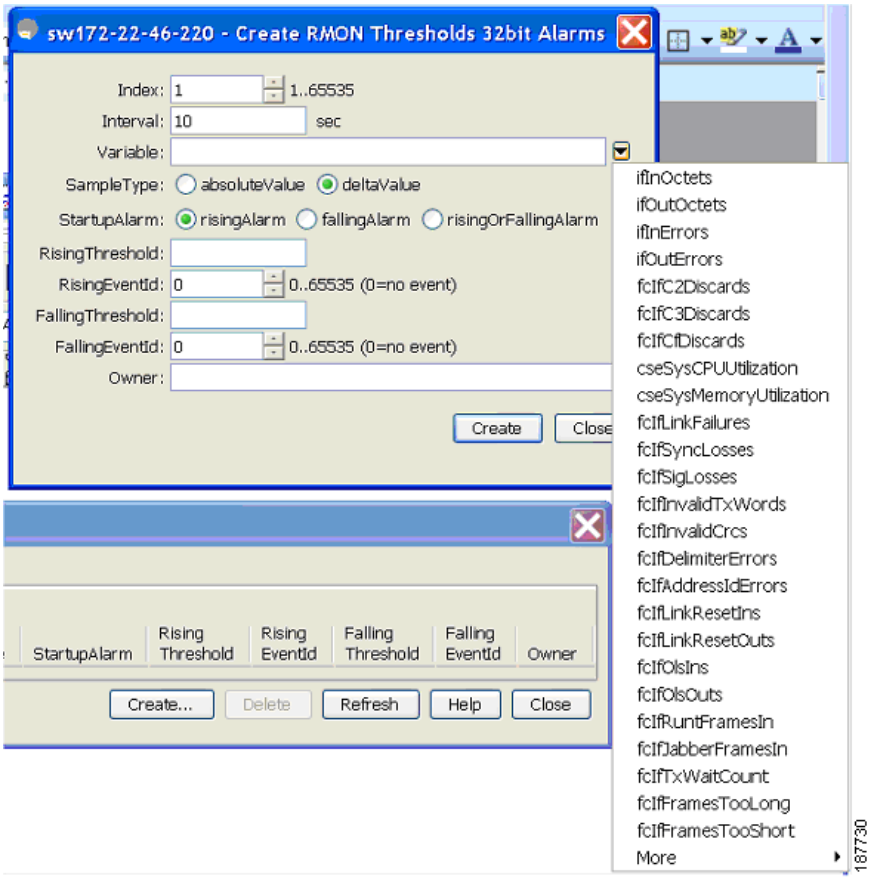
Note You need to supply the interface details along with variables selected from the drop-down list to complete the Variable field, for example, ifHCInOctets.

Step 5 Click the **32-bit alarms** tab.

Step 6 Click the **Create Row** tab.

Step 7 From the drop-down menu in the Variable field, choose from the list of MIB variables provided by the Threshold Manager (see Figure 8-7).

Figure 8-7 MIB Variable Field Dialog Box for 32-Bit Alarms



Step 8 Click the radio button to choose the RMON alarm to be created (32-bit or 64-bit HC Alarm).

Enabling 32-Bit RMON Alarms for VSANs

To enable an RMON alarm for one or more VSANs using Device Manager, follow these steps:

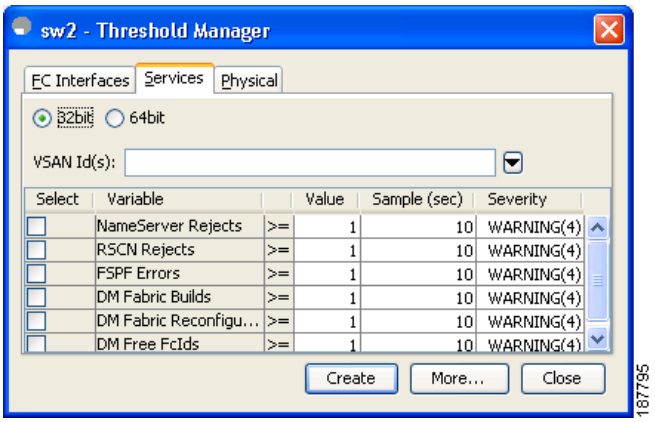
Step 1 Choose **Admin > Events > Threshold Manager** and click the **Services** tab.

You see the Threshold Manager dialog box.

Step 2 Click the **Services** tab.

You see the Threshold Manager dialog box with the Services tab for 32-bit alarm selected (see Figure 8-8).

Figure 8-8 Services Tab for 32-Bit Alarm Dialog Box



Step 3 Click the **32-bit** radio button.

Step 4 Enter one or more VSANs (multiple VSANs separated by commas) to monitor in the VSAN ID(s) field. Use the down arrow to see a list of available VSANs to choose from.

Step 5 Check the check box in the Select column for each variable to monitor.

Step 6 Enter the threshold value in the Value column.

Step 7 Enter the sampling period in seconds.

Step 8 Choose a severity level to assign to the alarm: **Fatal**, **Critical**, **Error**, **Warning**, **Information**.

Step 9 Click **Create.**

Step 10 Confirm the operation to define an alarm and a log event when the system prompts you to define a severity event.

If you do not confirm the operation, the system only defines a log event.

Step 11 Click **More,** and then click the **Alarms** tab in the Threshold Manager dialog box to verify the alarm you created.

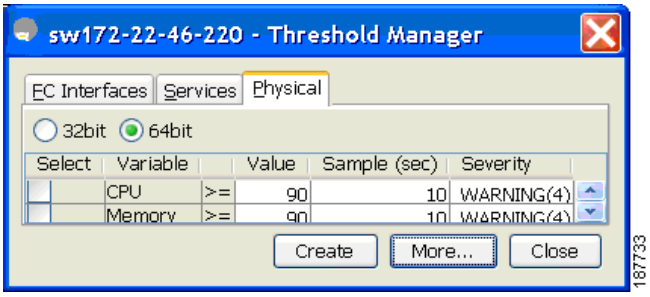
Enabling 32-Bit and 64-Bit RMON Alarms for Physical Components

To configure an RMON alarm for a physical component for a 64-bit alarm using Device Manager, follow these steps:

Step 1 Choose **Admin > Events > Threshold Manager** and click the **Physical** tab.

You see the Threshold Manager dialog box with the Physical tab for the 64-bit alarm selected (see Figure 8-9).

Figure 8-9 Physical Tab for the 64-Bit Alarm



Step 2 Check the check box in the Select column for each variable to monitor.

Step 3 Enter the threshold value in the Value column.

Step 4 Enter the sampling period in seconds.

Step 5 Choose one of the following severity levels to assign to the alarm: **Fatal(1)**, **Warning(2)**, **Critical(3)**, **Error(4)**, **Information(5)**.

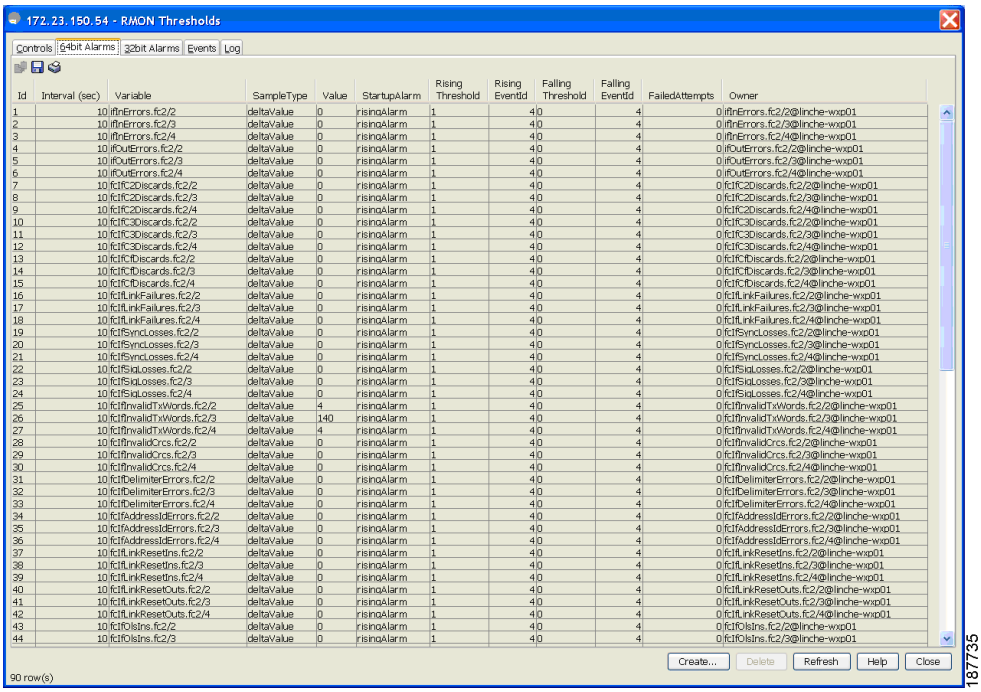
Step 6 Click **Create**.

Step 7 Confirm the operation to define an alarm and a log event when the system prompts you to define a severity event.

If you do not confirm the operation, the system only defines a log event.

Step 8 Click **More**, and then click the **64-bit Alarms** tab in the Threshold Manager dialog box to verify the alarm you created (see Figure 8-10).

Figure 8-10 64-Bit Alarm Tab



Note The MaxAlarm option is noneditable because of backend support. The max RMON alarms cannot be set using the CLI.

Creating a New RMON from Device Manager Threshold Manager

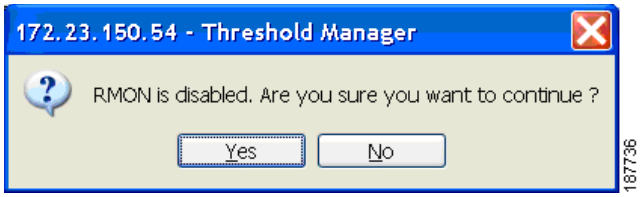
RMON does not check the RMON alarm configuration before configuring the switch.

To configure an RMON alarm from Device Manager Threshold Manager, follow these steps:

Step 1 Choose **Physical Attributes > Events > RMON** and click the **Control** tab.

You see the create RMON alarm Threshold Manager dialog box (see Figure 8-11).

Figure 8-11 Create RMON Alarm Threshold Manager



A user error is prompted if adding the new alarm exceeds the maximum alarm.

Note This feature is applicable when managing switches Release 4.1(1b) and later. Device Manager can only treat the existing alarm number as 0 for the checking.

Figure 8-12 RMON Control Threshold Tab

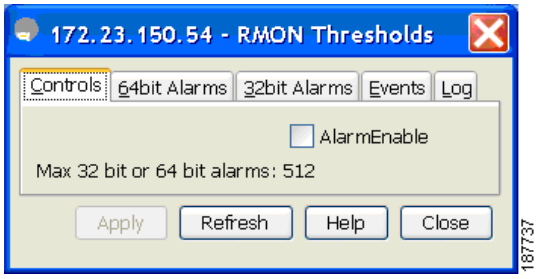
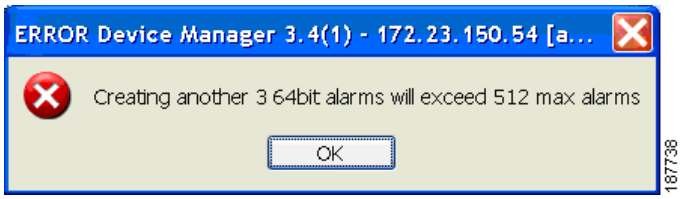


Figure 8-13 Device Manager Error Tab



Managing RMON Events

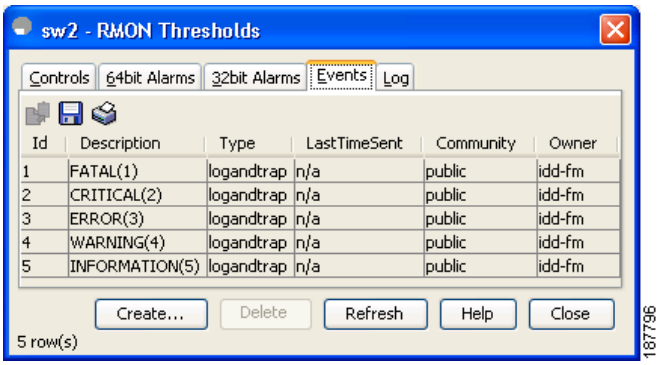
To define customized RMON events using Device Manager, follow these steps:

Step 1 Choose **Admin > Events > Threshold Manager** and click **More** in the Threshold Manager dialog box.

Step 2 Click the **Events** tab in the RMON Thresholds dialog box.

You see the RMON Thresholds Events tab (see Figure 8-14).

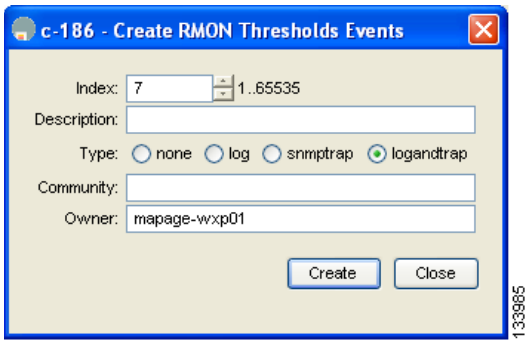
Figure 8-14 RMON Thresholds Events Tab



Step 3 Click **Create** to create an event entry.

You see the Create RMON Thresholds Events dialog box (see Figure 8-15).

Figure 8-15 Create RMON Thresholds Events Dialog Box



Step 4 Configure the RMON threshold event attributes by choosing the type of event (**log**, **snmptrap**, or **logandtrap**).

Step 5 Increment the index. If you try to create an event with the existing index, you see a duplicate entry error message.

Step 6 (Optional) Provide a description and a community.

Step 7 Click **Create**, then close this dialog box.

Step 8 Verify that your event is listed in the remaining RMON Thresholds dialog box.

Step 9 Click **Close** to close the RMON Thresholds dialog box.

Managing RMON Alarms

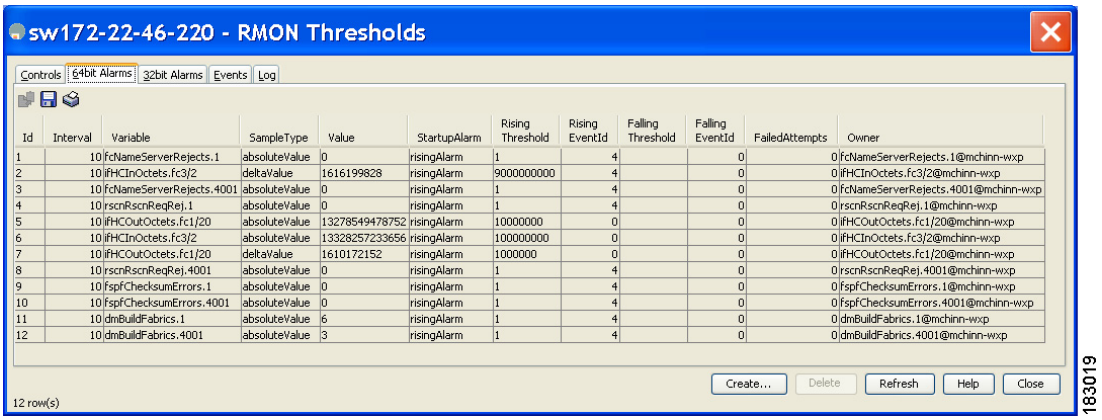
To view the alarms that have already been enabled using Device Manager, follow these steps:

Step 1 Choose **Admin > Events > Threshold Manager** and click **More** in the Threshold Manager dialog box.

Step 2 Click the **Alarms** tab.

You see the RMON Thresholds dialog box (see Figure 8-16).

Figure 8-16 RMON Thresholds Dialog Box



Step 3 Delete any alarm by selecting it, and then click **Delete**.

Viewing the RMON Log

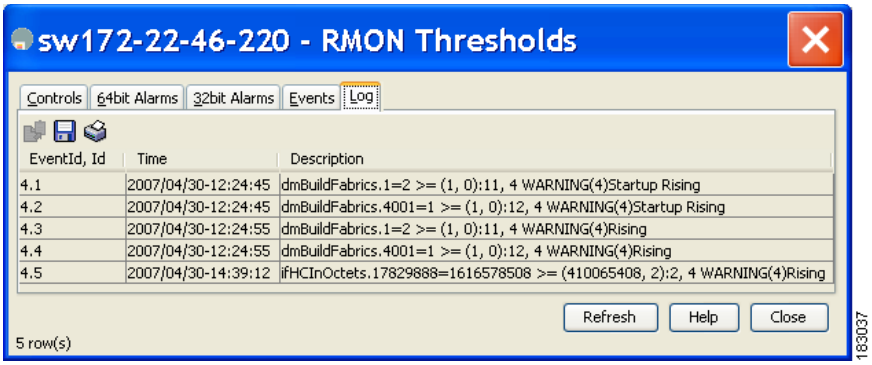
To view the RMON log using Device Manager, follow these steps:

Step 1 Choose **Admin > Events > Threshold Manager** and click **More** on the Threshold Manager dialog box.

Step 2 Click the **Log** tab in the RMON Thresholds dialog box.

You see the RMON Thresholds Log tab (see Figure 8-17). This is the log of RMON events that have been triggered by the Threshold Manager.

Figure 8-17 RMON Thresholds Log Tab



Default Settings

Table 8-1 lists the default settings for all RMON features in any switch.

Table 8-1 Default RMON Settings

Parameters	Default
RMON alarms	Disabled
RMON events	Disabled