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.

Information About RMON

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 information on an SNMP-compatible network management station, see the System Management Configuration Guide, Cisco DCNM for SAN.

For SNMP security-related CLI configurations, see .

RMON Configuration Information

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 an SNMP-compatible network management station.

Tip We recommend an additional, generic RMON console application on the network management station (NMS) to take advantage of RMON's network management capabilities. Refer to the System Management Configuration Guide, Cisco DCNM for SAN.

RMON Configuration 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 DCNM-SAN 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 Information

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.

Default Settings

Table 1: Default RMON Settings , on page 3 lists the default settings for all RMON features in any switch.

Table 1: Default RMON Settings

Parameters	Default
RMON alarms	Disabled
RMON events	Disabled

Configuring RMON

RMON is disabled by default, and no events or alarms are configured in the switch.

Configuring the RMON Traps in SNMP

To enable RMON traps in the SNMP configuration, follow these steps:

Before you begin

You must enable the RMON traps in the SNMP configuration for the RMON configuration to function correctly.

Procedure

Step 1 switch# **configure terminal**

Enters configuration mode.

Step 2 switch(config)# **snmp-server enable traps rmon**

Enables the RMON trap types.

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

Configuring the RMON Alarm

To enable RMON alarms, follow these steps:

Procedure

Step 1 switch# **configure terminal**

Enters configuration mode.

Step 2 switch(config)# **rmon alarm 20 1.3.6.1.2.1.2.2.1.14.16777216 2900 delta rising-threshold 15 1 falling-threshold 0 owner test**

Configures RMON alarm number 20 to monitor the 1.3.6.1.2.1.2.2.1.14.16777216 once every 900 seconds until the alarm is disabled and checks the change in the variables rise or fall. If the value shows a MIB counter increase of 15 or more, the software triggers an alarm. The alarm in turn triggers event number 1, which is configured with the RMON event command. Possible events can include a log entry or an SNMP trap. If the MIB value changes by 0, the alarm is reset and can be triggered again.

Note You can also configure the following rmon events:

- Event 1: Fatal
- Event 3: Error
- Event 4: Warning
- Event 5: Information

Step 3 switch(config)# **no rmon alarm 2**

Deletes the specified entry from the alarm table.

Configuring the RMON Event

To enable RMON events, follow these steps:

Procedure

Step 1 switch# **configure terminal**

Enters configuration mode.

Step 2 switch(config)# **rmon event 2 log trap eventtrap description CriticalErrors owner Test2**

Creates RMON event number 2 to define CriticalErrors and generates a log entry when the event is triggered by the alarm. The user Test2 owns the row that is created in the event table by this command. This example also generates an SNMP trap when the event is triggered.

Note You can also configure the following rmon events:

- Event 1: Fatal
- Event 3: Error
- Event 4: Warning
- Event 5: Information

Step 3 switch(config)# **no rmon event 5**

Deletes an entry from the RMON event table.

Verifying the RMON Configuration

To display the RMON configuration information, perform one of the following tasks:

Command	Purpose
show rmon alarms	Displays Configured RMON Alarms
show rmon hcalarms	Displays Configured RMON High Capacity Alarms
show rmon events	Displays Configured RMON Events

For detailed information about the fields in the output from these commands, refer to the Cisco MDS 9000 NX-OS Command Reference.

Use the **show rmon** and **show snmp** commands to display configured RMON and SNMP information (see Configured RMON Alarms, on page 5 and Configured RMON Events, on page 6).

Configured RMON Alarms

The following example displays configured RMON alarms:

```
switch# show rmon alarms
Alarm 1 is active, owned by admin
 Monitors 1.3.6.1.2.1.2.2.1.16.16777216 every 1 second(s)
 Taking delta samples, last value was 0
 Rising threshold is 1, assigned to event 0
 Falling threshold is 0, assigned to event 0
 On startup enable rising or falling alarm
```

Confirmed RMON High Capacity Alarms

The following example displays confirmed RMON high capacity alarms:

```
switch# show rmon hcalarms
High Capacity Alarm 10 is active, owned by Testuser
 Monitors 1.3.6.1.2.1.31.1.1.1.6.16785408 every 300 second(s)
```

```
Taking absolute samples, last value was 0 (valuePositive)
Rising threshold low is 4294967295 & high is 15 (valuePositive)
Rising threshold assigned to event 1
Falling threshold low is 0 & high is 0 (valueNotAvailable)
Falling threshold assigned to event 0
On startup enable rising alarm
Number of Failed Attempts is 0
```

Note High capacity RMON alarms can be configured using the CISCO-HC-ALARM-MIB. See the *Cisco MDS 9000 Series MIB Quick Reference*.

Configured RMON Events

The following example displays configured RMON events:

```
switch# show rmon events
Event 2 is active, owned by Test2
 Description is CriticalErrors
 Event firing causes log and trap to community eventtrap, last fired 0
Event 500 is active, owned by admin
 Description is
 Event firing causes log, last fired 138807208
```

Additional References

For additional information related to implementing RMON, see the following section:

MIBs

MIBs	MIBs Link
• CISCO-RMON-CAPABILITY.my • CISCO-RMON-CONFIG-CAPABILITY.my • CISCO-RMON-CONFIG-MIB	To locate and download MIBs, go to the following URL: http://www.cisco.com/en/US/products/ps5989/prod_technical_reference_list.html

Feature History for RMON

The following table lists the release history for this feature. Only features that were introduced or modified in Release 3.x or a later release appear in the table.

Table 2: Feature History for RMON

Feature Name	Releases	Feature Information
RMON high capacity alarms	3.0(1)	Provides the show rmon high capacity alarms command to display RMON high capacity alarm values.