Remote Monitoring (RMON)

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Overview

Remote Monitoring (RMON) is a Simple Network Management Protocol (SNMP) Internet Engineering Task Force (IETF) standard monitoring specification that allows various network agents and console systems to exchange network monitoring data. Cisco NX-OS supports RMON alarms, events, and logs to monitor Cisco NX-OS devices.

An RMON alarm monitors a specific management information base (MIB) object for a specified interval, triggers an alarm at a specified threshold value (threshold), and resets the alarm at another threshold value. You can use alarms with RMON events to generate a log entry or an SNMP notification when the RMON alarm triggers.

RMON is enabled by default, but no alarms are configured in Cisco NX-OS. You can configure RMON alarms by using the CLI or an SNMP-compatible network management station.

Default Settings and Supported Features

The following table lists the default settings for RMON parameters.

Parameters	Default
RMON	Enabled
Alarms	None configured

Supported Features

- Virtualization Support - Cisco NX-OS supports one instance of RMON. RMON is virtual routing and forwarding (VRF) aware. You can configure RMON to use a particular VRF to reach the RMON SMTP server.

- High Availability - Cisco NX-OS supports stateless restarts for RMON. After a reboot or supervisor switchover, Cisco NX-OS applies the running configuration.

Events

You can associate a particular event to each RMON alarm. RMON supports the following event types:

- SNMP notification—Sends an SNMP risingAlarm or fallingAlarm notification when the associated alarm triggers.
- Log—Adds an entry in the RMON log table when the associated alarm triggers.
- Both—Sends an SNMP notification and adds an entry in the RMON log table when the associated alarm triggers.

You can specify a different even for a falling alarm and a rising alarm.

Note You may choose to use the default RMON events template configuration or you can delete these entries and create new RMON events. Until you create RMON alarm configurations, no alarms will be triggered by these configurations.

Alarms

You can set an alarm on any MIB object that resolves into an SNMP INTEGER type. The specified object must be an existing SNMP MIB object in standard dot notation (for example, 1.3.6.1.2.1.2.2.1.14 represents ifInOctets.14).

When you create an alarm, you specify the following parameters:

- MIB object to monitor.
- Sampling interval—The interval that the device uses to collect a sample value of the MIB object.
- Sample type—Absolute samples take the current snapshot of the MIB object value. Delta samples take two consecutive samples and calculate the difference between them.
- Rising threshold—The value at which the device triggers a rising alarm or resets a falling alarm.
- Falling threshold—The value at which the device triggers a falling alarm or resets a rising alarm.
- Events—The action that the device takes when an alarm (rising or falling) triggers.

Note Use the hcalarms option to set an alarm on a 64-bit integer MIB object.

For example, you can set a delta type rising alarm on an error counter MIB object. If the error counter delta exceeds this value, you can trigger an event that sends an SNMP notification and logs the rising alarm event. This rising alarm will not occur again until the delta sample for the error counter drops below the falling threshold.

Note The falling threshold must be less than the rising threshold.

RMON Alarms

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For example, you can set a delta type rising alarm on an error counter MIB object. If the error counter delta exceeds this value, you can trigger an event that sends an SNMP notification and logs the rising alarm event. This rising alarm will not occur again until the delta sample for the error counter drops below the falling threshold.

Note The falling threshold must be less than the rising threshold.

RMON Events

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You can specify a different even for a falling alarm and a rising alarm.

Note You may choose to use the default RMON events template configuration or you can delete these entries and create new RMON events. Until you create RMON alarm configurations, no alarms will be triggered by these configurations.

High Availability for RMON

Cisco NX-OS supports stateless restarts for RMON. After a reboot or supervisor switchover, Cisco NX-OS applies the running configuration.

Virtualization Support for RMON

Cisco NX-OS supports one instance of RMON.

RMON is virtual routing and forwarding (VRF) aware. You can configure RMON to use a particular VRF to reach the RMON SMTP server.

Guidelines and Limitations

- You must configure an SNMP user and a notification receiver to use the SNMP notification event type.
- You can configure an RMON alarm only on a MIB object that resolves to an integer.
- When you configure an RMON alarm, the object identifier must be complete with its index so that it refers to only one object. For example, 1.3.6.1.2.1.2.2.1.14 corresponds to cpmCPUTotal5minRev, and .1 corresponds to index cpmCPUTotalIndex, which creates object identifier 1.3.6.1.2.1.2.2.1.14.1.

Default Settings for RMON

The following table lists the default settings for RMON parameters.

Parameters	Default
RMON	Enabled
Alarms	None configured

Configuration

Configuring RMON refers to the process of setting up Remote Monitoring (RMON) on a device.

Verify Configuration

Note The Cisco NX-OS commands for this feature may differ from those commands used in Cisco IOS.

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

Command	Purpose
show rmon alarms	Displays information about RMON alarms.
show rmon events	Displays information about RMON events.
show rmon hcalarms	Displays information about RMON high-capacity alarms.
show rmon logs	Displays information about RMON logs.

Configuration Examples

This example shows how to create a delta rising alarm on ifInOctets.14 and associates a notification event with this alarm:

```
configure terminal
rmon alarm 20 1.3.6.1.2.1.2.2.1.14.1 2900 delta rising-threshold 1500 1 falling-threshold
0 owner test
rmon event 1 trap trap1
```

Configure Alarms

Before you begin

Make sure that you have configured an SNMP user and enabled SNMP notifications.

You can configure RMON alarms on any integer-based SNMP MIB object.

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.

Ensure you have configured an SNMP user and enabled SNMP notifications.

Procedure

Step 1 Enter global configuration mode using the command **configure terminal**

Example:

```
switch# configure terminal
 switch(config)#
```

Step 2 Create an RMON alarm using the command **rmon alarm** *index mib-object sample-interval* { **absolute** | **delta** } **rising-threshold** *value* [*event-index*] **falling-threshold** *value* [*event-index*] [**owner** *name*]

Example:

```
switch(config)# rmon alarm 20 1.3.6.1.2.1.2.2.1.14.1 2900
delta rising-threshold 1500 1 falling-threshold 0 owner test
```

The value range is from –2147483647 to 2147483647. The owner name can be any alphanumeric string.

Step 3 Create an RMON high-capacity alarm using the command **rmon hcalarm** *index mib-object sample-interval* { **absolute** | **delta** } **rising-threshold-high** *value* **rising-threshold-low** *value* [*event-index*] **falling-threshold-high** *value* **falling-threshold-low** *value* [*event-index*] [**owner** *name*] [**storagetype** *type*]

Example:

```
switch(config)# rmon alarm 20 1.3.6.1.2.1.2.2.1.14.16777216 2900
delta rising-threshold-high 15 rising-threshold-low 151
falling-threshold-high 0 falling-threshold-low 0 owner test
```

The value range is from –2147483647 to 2147483647. The owner name can be any alphanumeric string.

The storage type range is from 1 to 5.

Step 4 Display information about RMON alarms or high-capacity alarms using the command **show rmon** { **alarms** | **hcalarms** }

Example:

```
switch(config)# show rmon alarms
```

This is an optional step.

Step 5 Copy the running configuration to the startup configuration using the command **copy running-config startup-config**

Example:

```
switch(config)# copy running-config startup-config
```

This is an optional step.

Configure Events

- Configure RMON events to associate with RMON alarms. You can reuse the same event with multiple RMON alarms.

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Before you begin

Make sure you have configured an SNMP user and enabled SNMP notifications.

Procedure

Step 1 Enter global configuration mode using the command **configure terminal**

Example:

```
switch# configure terminal
 switch(config)#
```

Step 2 Configure an RMON event using the command **rmon event** *index* [**description** *string*] [**log**] [**trap** *string*] [**owner** *name*]

Example:

```
switch(config)# rmon event 1 trap trap1
```

The description string, trap string, and owner name can be any alphanumeric string.

Step 3 Display information about RMON events using the command **show rmon events**

Example:

```
switch(config)# show rmon events
```

This is an optional step.

Step 4 Copy the running configuration to the startup configuration using the command **copy running-config startup-config**

Example:

```
switch(config)# copy running-config startup-config
```

This is an optional step.

Verifying the RMON Configuration

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

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show rmon events	Displays information about RMON events.
show rmon hcalarms	Displays information about RMON high-capacity alarms.
show rmon logs	Displays information about RMON logs.

Configuration Examples for RMON

This example shows how to create a delta rising alarm on ifInOctets.14 and associates a notification event with this alarm:

```
configure terminal
rmon alarm 20 1.3.6.1.2.1.2.2.1.14.1 2900 delta rising-threshold 1500 1 falling-threshold
0 owner test
rmon event 1 trap trap1
```

Additional References

MIBs related to RMON -

To locate and download supported MIBs, go to the following URL:

-
- https://cisco.github.io/cisco-mibs/supportlists/nexus9000/Nexus9000MIBSupportList.html

MIBs

MIBs	MIBs Link
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