

Configuring and Monitoring Alarm

This chapter describes monitoring alarms, alarms filtering support and configuring external alarms for fan tray alarm port.

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Monitoring Alarms

Once hardware is installed and operational, use alarms to monitor hardware status on a daily basis.

The routers are designed to send alarm notifications when problems are detected. Network administrators do not need to use show commands to poll devices on a routine basis and can monitor the network remotely. However, network administrators can perform onsite monitoring if they so choose.

Use **snmp-server enable traps alarms <severity>** command to enable the entity related Traps.

The default severity level is informational, which shows all alarms. Severity levels are defined as the following:

- 1—Critical. The condition affects service.
- 2—Major. Immediate action is needed.
- 3—Minor. Minor warning conditions.
- 4—Informational. No action is required. This is the default.

The entity notifications **ceAlarmAsserted** and **ceAlarmCleared** are used to report the condition for e.g. when a physical entity asserted or cleared an alarm.

Note Effective from Cisco IOS XE Everest 16.6.1, on RSP3 module, alarm notification is enabled on 900 watts DC power supply. There are 2 input feeds for 900 watts DC power supply, if one of the input voltage is lesser than the operating voltage, critical alarm is generated for that particular feed and clears (stops) once the voltage is restored but the power supply state remains in OK state as the other power supply is operationally up.

Network Administrator Checks Console or Syslog for Alarm Messages

The network administrator can monitor alarm messages by reviewing alarm messages sent to the system console or to a syslog.

Enabling the Logging Alarm Command

The logging alarm command must be enabled for the system to send alarm messages to a logging device, such as the console or a syslog. This command is not enabled by default.

You can specify the severity level of alarm to log. All alarms at and above the specified threshold generate alarm messages. For example, the following command sends only critical alarm messages to logging devices:

```
Router(config)# logging alarm critical
```

If alarm severity is not specified, alarm messages for all severity levels are sent to logging devices.

Examples of Alarm Messages

The following alarm messages are examples of alarm messages that are sent to the console when a SPA is removed without first doing a graceful deactivation of the SPA. The alarm is cleared when the SPA is re-inserted.

SPA REMOVED

*May 18 14:50:48.540: %TRANSCEIVER-6-REMOVED: SIP0: iomd: Transceiver module removed from TenGigabitEthernet0/0/1

*May 18 14:50:49.471: %IOSXE_OIR-6-REMSPA: SPA removed from subslot 0/0, interfaces disabled

*May 18 14:50:49.490: %SPA_OIR-6-OFFLINECARD: SPA (A900-IMA2Z) offline in subslot 0/0

SPA RE-INSERTED

*May 18 14:52:11.803: %IOSXE_OIR-6-INSSPA: SPA inserted in subslot 0/0

*May 18 14:52:52.807: %SPA_OIR-6-ONLINECARD: SPA (A900-IMA2Z) online in subslot 0/0

*May 18 14:52:53.543: %TRANSCEIVER-6-INSERTED: SIP0: iomd: transceiver module inserted in TenGigabitEthernet0/0/0

*May 18 14:52:53.551: %TRANSCEIVER-6-INSERTED: SIP0: iomd: transceiver module inserted in TenGigabitEthernet0/0/1

*May 18 14:52:54.780: %LINK-3-UPDOWN: Interface TenGigabitEthernet0/0/0, changed state to down

*May 18 14:52:54.799: %LINK-3-UPDOWN: Interface TenGigabitEthernet0/0/1, changed state to down

*May 18 14:53:06.578: %LINEPROTO-5-UPDOWN: Line protocol on Interface TenGigabitEthernet0/0/1, changed state to up

*May 18 14:53:08.482: %LINK-3-UPDOWN: Interface TenGigabitEthernet0/0/1, changed state to up

ALARMS for Router

To view the alarms on router, use the show facility-alarm status command. The example shows a critical alarm for Power supply along with the description:

SPA Removed

```
Router# show facility-alarm status
System Totals  Critical: 22  Major: 0  Minor: 0
Source                    Time                    Severity      Description [Index]
------                    ------                  --------      -------------------
subslot 0/0               May 18 2016 14:50:49    CRITICAL      Active Card Removed OIR
Alarm [0]
GigabitEthernet0/1/0      May 11 2016 18:53:36    CRITICAL      Physical Port Link Down [1]
GigabitEthernet0/1/1      May 11 2016 18:53:36    CRITICAL      Physical Port Link Down [1]
GigabitEthernet0/1/2      May 11 2016 18:53:36    CRITICAL      Physical Port Link Down [1]
GigabitEthernet0/1/5      May 11 2016 18:53:36    CRITICAL      Physical Port Link Down [1]
GigabitEthernet0/1/6      May 11 2016 18:53:36    CRITICAL      Physical Port Link Down [1]
GigabitEthernet0/1/7      May 11 2016 18:53:36    CRITICAL      Physical Port Link Down [1]
xcvr container 0/2/0      May 11 2016 18:54:25    CRITICAL      Transceiver Missing - Link
 Down [1]
xcvr container 0/2/2      May 11 2016 18:54:25    CRITICAL      Transceiver Missing - Link
 Down [1]
GigabitEthernet0/2/3      May 11 2016 18:54:25    CRITICAL      Physical Port Link Down [1]
xcvr container 0/2/4      May 11 2016 18:54:25    CRITICAL      Transceiver Missing - Link
 Down [1]
xcvr container 0/2/5      May 11 2016 18:54:25    CRITICAL      Transceiver Missing - Link
 Down [1]
GigabitEthernet0/2/6      May 11 2016 18:54:25    CRITICAL      Physical Port Link Down [1]
SONET 0/3/0               May 11 2016 18:54:25    INFO          Physical Port Administrative
 State Down [36]
xcvr container 0/3/1      May 11 2016 18:53:44    INFO          Transceiver Missing [0]
xcvr container 0/3/2      May 11 2016 18:53:44    INFO          Transceiver Missing [0]
xcvr container 0/3/3      May 11 2016 18:53:44    INFO          Transceiver Missing [0]
xcvr container 0/4/0      May 11 2016 18:54:25    CRITICAL      Transceiver Missing - Link
 Down [1]
xcvr container 0/4/1      May 11 2016 18:54:25    CRITICAL      Transceiver Missing - Link
 Down [1]
xcvr container 0/4/2      May 11 2016 18:54:25    CRITICAL      Transceiver Missing - Link
 Down [1]
GigabitEthernet0/4/3      May 11 2016 18:54:25    CRITICAL      Physical Port Link Down [1]
xcvr container 0/4/4      May 11 2016 18:54:25    CRITICAL      Transceiver Missing - Link
 Down [1]
xcvr container 0/4/5      May 11 2016 18:54:25    CRITICAL      Transceiver Missing - Link
 Down [1]
xcvr container 0/4/6      May 11 2016 18:54:25    CRITICAL      Transceiver Missing - Link
 Down [1]
xcvr container 0/4/7      May 11 2016 18:54:25    CRITICAL      Transceiver Missing - Link
 Down [1]
TenGigabitEthernet0/4/8   May 11 2016 18:54:25    CRITICAL      Physical Port Link Down
[35]
```

SPA Re-Inserted

```
Router# show facility-alarm status
System Totals  Critical: 22  Major: 0  Minor: 0
Source                    Time                    Severity      Description [Index]
------                    ------                  --------      -------------------
TenGigabitEthernet0/0/0   May 18 2016 14:53:02    CRITICAL      Physical Port Link Down
[35]
GigabitEthernet0/1/0      May 11 2016 18:53:36    CRITICAL      Physical Port Link Down [1]
GigabitEthernet0/1/1      May 11 2016 18:53:36    CRITICAL      Physical Port Link Down [1]
GigabitEthernet0/1/2      May 11 2016 18:53:36    CRITICAL      Physical Port Link Down [1]
GigabitEthernet0/1/5      May 11 2016 18:53:36    CRITICAL      Physical Port Link Down [1]
GigabitEthernet0/1/6      May 11 2016 18:53:36    CRITICAL      Physical Port Link Down [1]
GigabitEthernet0/1/7      May 11 2016 18:53:36    CRITICAL      Physical Port Link Down [1]
xcvr container 0/2/0      May 11 2016 18:54:25    CRITICAL      Transceiver Missing - Link
 Down [1]
xcvr container 0/2/2      May 11 2016 18:54:25    CRITICAL      Transceiver Missing - Link
 Down [1]
```

```
GigabitEthernet0/2/3       May 11 2016 18:54:25   CRITICAL      Physical Port Link Down [1]
xcvr container 0/2/4       May 11 2016 18:54:25   CRITICAL      Transceiver Missing - Link
 Down [1]
xcvr container 0/2/5       May 11 2016 18:54:25   CRITICAL      Transceiver Missing - Link
 Down [1]
GigabitEthernet0/2/6       May 11 2016 18:54:25   CRITICAL      Physical Port Link Down [1]
SONET 0/3/0               May 11 2016 18:54:25   INFO          Physical Port Administrative
 State Down [36]
xcvr container 0/3/1       May 11 2016 18:53:44   INFO          Transceiver Missing [0]
xcvr container 0/3/2       May 11 2016 18:53:44   INFO          Transceiver Missing [0]
xcvr container 0/3/3       May 11 2016 18:53:44   INFO          Transceiver Missing [0]
xcvr container 0/4/0       May 11 2016 18:54:25   CRITICAL      Transceiver Missing - Link
 Down [1]
xcvr container 0/4/1       May 11 2016 18:54:25   CRITICAL      Transceiver Missing - Link
 Down [1]
xcvr container 0/4/2       May 11 2016 18:54:25   CRITICAL      Transceiver Missing - Link
 Down [1]
GigabitEthernet0/4/3       May 11 2016 18:54:25   CRITICAL      Physical Port Link Down [1]
xcvr container 0/4/4       May 11 2016 18:54:25   CRITICAL      Transceiver Missing - Link
 Down [1]
xcvr container 0/4/5       May 11 2016 18:54:25   CRITICAL      Transceiver Missing - Link
 Down [1]
xcvr container 0/4/6       May 11 2016 18:54:25   CRITICAL      Transceiver Missing - Link
 Down [1]
xcvr container 0/4/7       May 11 2016 18:54:25   CRITICAL      Transceiver Missing - Link
 Down [1]
TenGigabitEthernet0/4/8    May 11 2016 18:54:25   CRITICAL      Physical Port Link Down
[35]
```

To view critical alarms specifically, use the show facility-alarm status critical command:

```
Router# show facility-alarm status critical
System Totals  Critical: 22  Major: 0  Minor: 0
Source                     Time                   Severity      Description [Index]
------                     ------                 --------      -------------------
TenGigabitEthernet0/0/0    May 18 2016 14:53:02   CRITICAL      Physical Port Link Down
[35]
GigabitEthernet0/1/0       May 11 2016 18:53:36   CRITICAL      Physical Port Link Down [1]
GigabitEthernet0/1/1       May 11 2016 18:53:36   CRITICAL      Physical Port Link Down [1]
GigabitEthernet0/1/2       May 11 2016 18:53:36   CRITICAL      Physical Port Link Down [1]
GigabitEthernet0/1/5       May 11 2016 18:53:36   CRITICAL      Physical Port Link Down [1]
GigabitEthernet0/1/6       May 11 2016 18:53:36   CRITICAL      Physical Port Link Down [1]
GigabitEthernet0/1/7       May 11 2016 18:53:36   CRITICAL      Physical Port Link Down [1]
xcvr container 0/2/0       May 11 2016 18:54:25   CRITICAL      Transceiver Missing - Link
 Down [1]
xcvr container 0/2/2       May 11 2016 18:54:25   CRITICAL      Transceiver Missing - Link
 Down [1]
GigabitEthernet0/2/3       May 11 2016 18:54:25   CRITICAL      Physical Port Link Down [1]
xcvr container 0/2/4       May 11 2016 18:54:25   CRITICAL      Transceiver Missing - Link
 Down [1]
xcvr container 0/2/5       May 11 2016 18:54:25   CRITICAL      Transceiver Missing - Link
 Down [1]
GigabitEthernet0/2/6       May 11 2016 18:54:25   CRITICAL      Physical Port Link Down [1]
xcvr container 0/4/0       May 11 2016 18:54:25   CRITICAL      Transceiver Missing - Link
 Down [1]
xcvr container 0/4/1       May 11 2016 18:54:25   CRITICAL      Transceiver Missing - Link
 Down [1]
xcvr container 0/4/2       May 11 2016 18:54:25   CRITICAL      Transceiver Missing - Link
 Down [1]
GigabitEthernet0/4/3       May 11 2016 18:54:25   CRITICAL      Physical Port Link Down [1]
xcvr container 0/4/4       May 11 2016 18:54:25   CRITICAL      Transceiver Missing - Link
 Down [1]
xcvr container 0/4/5       May 11 2016 18:54:25   CRITICAL      Transceiver Missing - Link
 Down [1]
```

```
xcvr container 0/4/6       May 11 2016 18:54:25   CRITICAL      Transceiver Missing - Link
 Down [1]
xcvr container 0/4/7       May 11 2016 18:54:25   CRITICAL      Transceiver Missing - Link
 Down [1]
TenGigabitEthernet0/4/8    May 11 2016 18:54:25   CRITICAL      Physical Port Link Down
[35]
```

To view the operational state of the major hardware components on the router, use the show platform diag command. This example shows the Power supply P0 has failed:

```
Router# show platform diag
Chassis type: ASR903
Slot: 1, A900-RSP2A-128
  Running state               : ok
  Internal state              : online
  Internal operational state  : ok
  Physical insert detect time : 00:02:33 (00:57:31 ago)
  Software declared up time   : 00:03:41 (00:56:24 ago)
  CPLD version                : 15092360
  Firmware version            : 15.4(3r)S2
Sub-slot: 0/0, A900-IMA2Z
  Operational status          : ok
  Internal state              : inserted
  Physical insert detect time : 00:04:46 (00:55:19 ago)
  Logical insert detect time  : 00:04:46 (00:55:19 ago)
Sub-slot: 0/1, A900-IMA8T
  Operational status          : ok
  Internal state              : inserted
  Physical insert detect time : 00:04:46 (00:55:19 ago)
  Logical insert detect time  : 00:04:46 (00:55:19 ago)
Sub-slot: 0/2, A900-IMA8S
  Operational status          : ok
  Internal state              : inserted
  Physical insert detect time : 00:04:46 (00:55:19 ago)
  Logical insert detect time  : 00:04:46 (00:55:19 ago)
Sub-slot: 0/3, A900-IMA4OS
  Operational status          : ok
  Internal state              : inserted
  Physical insert detect time : 00:04:46 (00:55:18 ago)
  Logical insert detect time  : 00:04:46 (00:55:18 ago)
Sub-slot: 0/4, A900-IMA8S1Z
  Operational status          : ok
  Internal state              : inserted
  Physical insert detect time : 00:04:46 (00:55:18 ago)
  Logical insert detect time  : 00:04:46 (00:55:18 ago)
Sub-slot: 0/5, A900-IMASER14A/S
  Operational status          : ok
  Internal state              : inserted
  Physical insert detect time : 00:04:46 (00:55:19 ago)
  Logical insert detect time  : 00:04:46 (00:55:19 ago)
Slot: R0, A900-RSP2A-128
  Running state               : ok, standby
  Internal state              : online
  Internal operational state  : ok
  Physical insert detect time : 00:24:37 (00:35:28 ago)
  Software declared up time   : 00:31:28 (00:28:36 ago)
  CPLD version                : 15092360
  Firmware version            : 15.4(3r)S2
Slot: R1, A900-RSP2A-128
  Running state               : ok, active
  Internal state              : online
  Internal operational state  : ok
  Physical insert detect time : 00:02:33 (00:57:31 ago)
  Software declared up time   : 00:02:33 (00:57:31 ago)
```

```
  Became HA Active time       : 00:34:41 (00:25:23 ago)
  CPLD version                : 15092360
  Firmware version            : 15.4(3r)S2
Slot: F0,
  Running state               : ok, standby
  Internal state              : online
  Internal operational state  : ok
  Physical insert detect time : 00:24:37 (00:35:28 ago)
  Software declared up time   : 00:31:45 (00:28:20 ago)
  Hardware ready signal time  : 00:31:39 (00:28:25 ago)
  Packet ready signal time    : 00:33:25 (00:26:40 ago)
  CPLD version                : 15092360
  Firmware version            : 15.4(3r)S2
Slot: F1,
  Running state               : ok, active
  Internal state              : online
  Internal operational state  : ok
  Physical insert detect time : 00:02:33 (00:57:31 ago)
  Software declared up time   : 00:03:23 (00:56:42 ago)
  Hardware ready signal time  : 00:03:14 (00:56:51 ago)
  Packet ready signal time    : 00:04:19 (00:55:46 ago)
  Became HA Active time       : 00:33:25 (00:26:40 ago)
  CPLD version                : 15092360
  Firmware version            : 15.4(3r)S2
Slot: P0, Unknown
  State                       : N/A
  Physical insert detect time : 00:00:00 (never ago)
Slot: P1, A900-PWR550-A
  State                       : ok
  Physical insert detect time : 00:03:17 (00:56:48 ago)
Slot: P2, A903-FAN-E
  State                       : ok
  Physical insert detect time : 00:03:21 (00:56:44 ago)
```

Reviewing and Analyzing Alarm Messages

To facilitate the review of alarm messages, you can write scripts to analyze alarm messages sent to the console or syslog. Scripts can provide reports on events such as alarms, security alerts, and interface status.

Syslog messages can also be accessed through Simple Network Management Protocol (SNMP) using the history table defined in the CISCO-SYSLOG-MIB.

Configuring External Alarm Trigger

For Cisco ASR 902 Series Router, the fan tray includes an alarm port that maps to two (0 and 1) dry contact alarm inputs.For Cisco ASR 903 Series Router, the fan tray includes an alarm port that maps to four (0 - 3) dry contact alarm inputs.

The pins on the alarm port are passive signals and can be configured as Open (an alarm generated when current is interrupted) or Closed (an alarm is generated when a circuit is established) alarms. You can configure each alarm input as critical, major, or minor. An alarm triggers alarm LEDs and alarm messages. The relay contacts can be controlled through any appropriate third-party relay controller. The open/close configuration is an option controlled in IOS.

Approaches for Monitoring Hardware Alarms

Onsite Network Administrator Responds to Audible or Visual Alarms

An external element can be connected to a power supply using the DB-25 alarm connector on the power supply. The external element is a DC light bulb for a visual alarm and a bell for an audible alarm.

If an alarm illuminates the CRIT, MIN, or MAJ LED on the Cisco ASR 900 Series Route Processor (RP) faceplate, and a visual or audible alarm is wired, the alarm also activates an alarm relay in the power supply DB-25 connector. The bell rings or the light bulb flashes.

Clearing Audible and Visual Alarms

To clear an audible alarm, do one of the following:

- Press the Audible Cut Off button on the RP faceplate.

To clear a visual alarm, you must resolve the alarm condition. . For example, if a critical alarm LED is illuminated because an active SPA was removed without a graceful deactivation of the SPA, the only way to resolve that alarm is to replace the SPA.

Note The **clear faciltity-alarm** command is not supported. The **clear facility-alarm** command does not clear an alarm LED on the RP faceplate or turn off the DC lightbulb

How to Configure External Alarms

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 3	**alarm-contact** *contact-number* **description** *string* **Example:** `Router(config)#alarm-contact 2 description door sensor`	(Optional) Configures a description for the alarm contact number. • The contact-number can be from 1 to 4. • The description string can be up to 80 alphanumeric characters in length and is included in any generated system messages

	Command or Action	Purpose
Step 4	**alarm-contact** {*contact-number* | **all** {**severity** {**critical** | **major** | **minor**} | **trigger** {**closed** | **open**}} **Example:** `Router(config)#alarm-contact 2 severity major`	Configures the trigger and severity for an alarm contact number or for all contact numbers. • Enter a contact number (1 to 4) or specify that you are configuring **all** alarms. • For **severity**, enter **critical**, **major**, or **minor**. If you do not configure a severity, the default is **minor**. • For **trigger**, enter **open** or **closed**. If you do not configure a trigger, the alarm is triggered when the circuit is **closed**.
Step 5	**exit** **Example:** `Router#exit`	Exits the configuration mode.
Step 6	**show facility-alarm status** **Example:** `Router#show facility-alarm status`	Displays configured alarms status.

Example

```
Router>enable
Router#configure terminal
Router(config)#alarm-contact 2 description door sensor
Router(config)#alarm-contact 2 severity major
Router(config)#alarm-contact 2 trigger open
Router(config)#end
Router#show facility-alarm status
System Totals  Critical: 15  Major: 0  Minor: 0

Source                    Time                  Severity      Description [Index]
------                    ------                --------      -------------------
subslot 0/0               Sep 21 2016 15:19:55   CRITICAL      Active Card Removed OIR
Alarm [0]
subslot 0/1               Sep 21 2016 15:19:12   CRITICAL      Active Card Removed OIR
Alarm [0]
subslot 0/2               Sep 21 2016 15:16:59   CRITICAL      Active Card Removed OIR
Alarm [0]
subslot 0/3               Sep 21 2016 15:18:10   CRITICAL      Active Card Removed OIR
Alarm [0]
subslot 0/5               Sep 21 2016 15:16:11   CRITICAL      Active Card Removed OIR
Alarm [0]
subslot 0/6               Sep 21 2016 15:15:45   CRITICAL      Active Card Removed OIR
Alarm [0]
subslot 0/7               Sep 21 2016 15:14:22   CRITICAL      Active Card Removed OIR
Alarm [0]
subslot 0/8               Sep 21 2016 15:10:33   CRITICAL      Active Card Removed OIR
Alarm [0]
subslot 0/9               Sep 21 2016 12:00:43   CRITICAL      Active Card Removed OIR
Alarm [0]
subslot 0/10              Sep 21 2016 15:11:49   CRITICAL      Active Card Removed OIR
```

```
Alarm [0]
subslot 0/13              Sep 21 2016 14:56:35   CRITICAL      Active Card Removed OIR
Alarm [0]
subslot 0/14              Sep 21 2016 14:56:29   CRITICAL      Active Card Removed OIR
Alarm [0]
subslot 0/15              Sep 21 2016 14:56:33   CRITICAL      Active Card Removed OIR
Alarm [0]
Fan Tray Bay 0            Sep 21 2016 11:50:39   CRITICAL     Fan Tray Module Missing [0]
Router(config)#
```



Note The external alarm trigger and syslog support configuration is supported from Cisco IOS XE Release 3.13.0S.

Alarm Filtering Support

The Alarm Filtering Support in the Cisco Entity Alarm MIB feature implements the alarm filter profile capability defined in CISCO-ENTITY-ALARM-MIB. Also implemented are configuration commands to control the severity of syslog messages and SNMP notifications triggered by the alarms.

Information About Alarm Filtering Support

Overview of Alarm Filtering Support

To configure alarm filtering in the Cisco Entity Alarm MIB, you should understand the following concepts:

CISCO-ENTITY-ALARM-MIB

The CISCO-ENTITY-ALARM-MIB provides a management client with the capability to monitor alarms generated by physical entities in a network that are identified in the entPhysicalTable of the Entity-MIB (RFC 2737). Examples of these physical entities are chassis, fans, modules, ports, slots, and power supplies. The management client interfaces with an SNMP agent to request access to objects defined in the CISCO-ENTITY-ALARM-MIB.

ceAlarmGroup

The ceAlarmGroup is a group in the CISCO-ENTITY-ALARM-MIB that defines objects that provide current statuses of alarms and the capability to instruct an agent to stop (cut off) signaling for any or all external audible alarms.

Following are the objects in ceAlarmGroup:

- ceAlarmCriticalCount
- ceAlarmMajorCount
- ceAlarmMinorCount
- ceAlarmCutoff
- ceAlarmFilterProfile
- ceAlarmSeverity
- ceAlarmList

ceAlarmFilterProfileTable

The ceAlarmFilterProfileTable filters alarms according to configured alarm lists. The filtered alarms are then sent out as SNMP notifications or syslog messages, based on the alarm list enabled for each alarm type. This table is defined in the CISCO-ENTITY-ALARM-MIB and implemented in the group ceAlarmGroup.

ceAlarmFilterProfile

An alarm filter profile controls the alarm types that an agent monitors and signals for a corresponding physical entity. The ceAlarmFilterProfile object holds an integer value that uniquely identifies an alarm filter profile associated with a corresponding physical entity. When the value is zero, the agent monitors and signals all alarms associated with the corresponding physical entity.

ceAlarmHistTable:

This table contains the history of ceAlarmAsserted and ceAlarmCleared traps generated by the agent.

Each entry to the table will have physical index from entPhsicalTable and the severity of the alarm.

The ceAlarmAsserted and ceAlarmCleared trap varbinds are mostly from this table and the description from ceAlarmDescrTable.

ceAlarmDescrTable:

This table contains a description for each alarm type defined by each vendor type employed by the system.

This table has the list of possible severity levels and the description for the physical entity, Object "ceAlarmDescrSeverity" indicates the severity of an alarm (1 to 4 as above).

ceAlarmTable:

This table specifies alarm control and status information related to each physical entity contained by the system, including the alarms currently being asserted by each physical entity capable of generating alarms.

Prerequisites for Alarm Filtering Support

- SNMP is configured on your routing devices.
- Familiarity with the ENTITY-MIB and the CISCO-ENTITY-ALARM-MIB.

Restrictions for Alarm Filtering Support

- The CISCO-ENTITY-ALARM-MIB supports reporting of alarms for physical entities only, including chassis, slots, modules, ports, power supplies, and fans. In order to monitor alarms generated by a physical entity,it must be represented by a row in the entPhysicalTable .

How to Configure Alarm Filtering for Syslog Messages and SNMP Notifications

Configuring Alarm Filtering for Syslog Messages

This task describes how to configure the alarm severity threshold for generating syslog messages. When you use this command, the alarm severity threshold is included in the running configuration and automatically applied when the configuration is reloaded.

```
enable
configure terminal
```

```
logging alarm 2
show facility-alarm status
```

Configuring Alarm Filtering for SNMP Notifications

This task describes how to configure the alarm severity threshold for generating SNMP notifications. When you use this command, the alarm severity threshold is included in the running configuration and automatically applied when the configuration is reloaded.

```
enable
configure terminal
snmp-server enable traps alarms 2
show facility-alarm status
```

Configuration Examples for Alarm Filtering Support

Configuring Alarm Filtering for Syslog Messages: Example

The following example shows how to configure an alarm filter for syslog messages:

Configuring Alarm Filtering for SNMP Notifications: Example

The following example shows how to configure an alarm filter for SNMP notifications:

```
Router# enable
Router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
 Router(config)# snmp-server enable traps alarms 2
Router(config)#
Router(config)# exit
Router# show facility-alarm status
System Totals  Critical: 2  Major: 1  Minor: 0
Source                    Time                   Severity      Description [Index]
------                    ------                 --------      -------------------
Power Supply Bay 0        Jun 07 2016 13:36:49   CRITICAL      Power Supply/FAN Module
Missing [0]
Fan Tray/Ext. ALARM:      Jun 07 2016 13:36:55   MAJOR        Fan Tray/Fan 8 Failure [15]
xcvr container 0/5/0      Jun 07 2016 13:37:43   CRITICAL      Transceiver Missing - Link
 Down [1]
xcvr container 0/5/1      Jun 07 2016 13:37:43   INFO          Transceiver Missing [0]
xcvr container 0/5/2      Jun 07 2016 13:37:43   INFO          Transceiver Missing [0]
xcvr container 0/5/3      Jun 07 2016 13:37:43   INFO          Transceiver Missing [0]
xcvr container 0/5/4      Jun 07 2016 13:37:43   INFO          Transceiver Missing [0]
xcvr container 0/5/5      Jun 07 2016 13:37:43   INFO          Transceiver Missing [0]
xcvr container 0/5/6      Jun 07 2016 13:37:43   INFO          Transceiver Missing [0]
xcvr container 0/5/7      Jun 07 2016 13:37:43   INFO          Transceiver Missing [0]
```

Facility Protocol Status Support

The routers report the protocol status using Syslog or Trap alarm notifications. Few Syslogs and Traps are not cleared when the router gets disconnected or reloaded. As a result, the alarms are not notified.

To avoid this, a new command, **show facility-protocol status**, is introduced that displays the output of the following routing protocols status at any interval of time:

- ISIS
- OSPF
- BGP
- TE Tunnels
- LDP
- Bundles
- PWs
- EVPN PWs
- CFM
- SYncE
- PTP
- HSRP
- BFD
- SensorThresholdViolations

show facility protocol status

The **show facility-protocol status** command helps to backup the protocols syslog information by capturing the current status of the protocols on the system.

Also, when you add a new device, the command can be used to generate a list of the outstanding protocol alarms from the device.

Restrictions

Only 14 routing protocols outputs can be displayed.

Routing Protocols Outputs

The following are the outputs of different routing protocols:

OSPF Output

```
#show facility-protocol status
```

```
Protocols   Pid  Ver  Interface                IP-address       Status         Adj-ID
      Router-ID
-------------------------------------------------------------------------------------
OSPF       22    V2   TenGigabitEthernet0/3/4   10.0.1.2         FULL           21.22.23.25
      15.88.15.89
OSPF       100   V2   FortyGigabitEthernet0/8/1 192.168.1.1      DOWN           N/A
       100.100.100.100
```

MPLS Output

```
#show facility-protocol status
=============================================================================================
Protocols         Name   Interface                Src-IP         LDP_Neigh_IP     Status
=============================================================================================
MPLS-LDP          LDP    TenGigabitEthernet0/3/4  10.0.1.2       N/A              DOWN

MPLS-LDP          LDP    FortyGigabitEthernet0/8/1 192.168.1.1   N/A              DOWN

MPLS-LDP          LDP    GigabitEthernet0/2/0     22.1.4.1       7.7.7.7:0        UP

MPLS-LDP          LDP    GigabitEthernet0/2/4     22.0.1.1       6.6.6.6:0        UP

MPLS-LDP          LDP    Tunnel2001               5.5.5.5        2.2.2.2:0        DOWN

MPLS-LDP          LDP    Tunnel2002               5.5.5.5        2.2.2.2:0        DOWN

MPLS-LDP          LDP    Tunnel2003               5.5.5.5        2.2.2.2:0        DOWN

MPLS-LDP          LDP    Tunnel2004               5.5.5.5        2.2.2.2:0        DOWN

MPLS-LDP          LDP    Tunnel2005               5.5.5.5        2.2.2.2:0        DOWN

MPLS-LDP          LDP    Tunnel2006               5.5.5.5        2.2.2.2:0        DOWN

MPLS-LDP          LDP    Tunnel2007               5.5.5.5        2.2.2.2:0        DOWN

MPLS-LDP          LDP    Tunnel2008               5.5.5.5        2.2.2.2:0        DOWN

MPLS-LDP          LDP    Tunnel2009               5.5.5.5        2.2.2.2:0        DOWN
```

ISIS Output

```
#show facility-protocol status
=============================================================================================
Protocols      Interface       ISIS-Type         Neigh-IP        Net-ID             Status
     Sys-ID           Hold-Time
=============================================================================================
ISIS   HundredGigE0/7/0          Level-1       NA              NA                 DOWN
      NA                  NA
ISIS   HundredGigE0/7/0          Level-2       NA              NA                 DOWN
      NA                  NA
ISIS   GigabitEthernet0/3/4      Level-2       10.147.158.2    0000.0000.0158     UP
      NCS4206-158         26
ISIS   BDI72                     Level-2       10.10.72.2      0000.0000.0162     UP
      NCS4K-101-162       29
ISIS   BDI27                     Level-2       10.10.27.2      0000.0000.0162     UP
      NCS4K-101-162       23
ISIS   GigabitEthernet0/0/7      Level-2       NA              NA                 UP
      0000.0000.0152      250
ISIS   TenGigabitEthernet0/3/0   Level-2       38.206.1.3      0000.0000.0023     UP
      C101_A              28
ISIS   GigabitEthernet0/2/3      Level-2       38.76.1.3       0000.0000.0007     UP
      ASR9K_CORE          23
ISIS   Tunnel1315               Level-2       7.7.15.2        0000.0000.0007     UP
      ASR9K_CORE          28
```

BGP Output

```
#show facility-protocol status
=============================================================================================
Protocols  LocalAS   RemoteAS  NeighborIP             Status        Up/Down Time
Remote-RID   VRF-Inst-Name
=============================================================================================
```

```
BGP         123         123         21.22.23.25          DOWN            never
0.0.0.0     NA
BGP         123         123         66.66.66.23          DOWN            never
0.0.0.0     CustomerA
BGP         500         500         10.0.0.158            DOWN            never
0.0.0.0     NA
BGP         500         100         10.147.158.2         DOWN            1
0.0.0.0     SENTHIL
BGP         500                                          DOWN            1
0.0.0.0
```

Pseudowire Output

```
#show facility-protocol status
=============================================================================================
Protocols       Peer-IP                 VC-ID        VC-Status       VC-Error
=============================================================================================
PWs             10.0.0.146               2            ADMIN DOWN      NA
PWs             10.0.0.146               9            ADMIN DOWN      NA
PWs             10.0.0.146              10           ADMIN DOWN      NA
PWs             10.0.0.146               54           DOWN            NA
PWs             10.0.0.146               87           DOWN            NA
PWs             10.0.0.146               98           DOWN            NA
```

SYncE Output

```
#show facility-protocol status
=============================================================================================
Protocols  Interface                Mode/QL    QL-IN       QL-Rx-Config   QL-Rx-Overrided

=============================================================================================
SyncE    GigabitEthernet0/1/7       Sync/En    QL-DNU       -                QL-DNU
SyncE                               Sync/En    QL-DNU       -                QL-DNU
SyncE                               Sync/En    QL-DNU       -                QL-DNU
SyncE                               Sync/En    QL-DNU       -                QL-DNU
```

Bundles Output

```
#show facility-protocol status
=============================================================================================
Protocols          Port-Channel          Bundle-Status       Bundled-Ports       Min-Bundle
=============================================================================================
BUNDLES            Po48                   DOWN                0                   2
```

PTP Output

```
#show facility-protocol status
=============================================================================================
Protocols  Event               Interface             Role     Clock-port-Name    State
       Master-IP
=============================================================================================
PTP CLK_MASTER_PORT_SELECTED   NA                    slave     tomaster           NA
         UNKNOWN

PTP CLK_STATUS_UPDATE     Loopback1588               slave     NA             FREERUN
         NA

PTP CLK_MASTER_PORT_SELECTED   NA                    slave     slave              NA
         21.21.21.21

PTP CLK_STATUS_UPDATE     Loopback0                  slave     NA             ACQUIRING
         NA
```

HSRP Output

```
#show facility-protocol status
=======================================================
Protocols  Interface                 Group       State
=======================================================
HSRP       HundredGigE0/7/0            1          Init
```

TE Tunnels Output

```
#show facility-protocol status
=============================================================================================================
Protocols          Tunnel-Interface            Status
=============================================================================================================
MPLS-TE            Tunnel0                     DOWN
MPLS-TE            Tunnel1                     DOWN
```

BFD Output

```
#show facility-protocol status
=============================================================================================================
Protocols    Interface                Status           Neigh-Addr      Local-Descriminator
  Interface_index
=============================================================================================================
BFD          FortyGigabitEthernet0/8/1   DOWN            NA                  NA
       22
BFD          TenGigabitEthernet0/3/0     DOWN            NA                  NA
       9
BFD          GigabitEthernet0/5/4        DOWN            NA                  NA
       15
BFD          Tunnel1309                  DOWN            NA                  NA
       1601
```

CFM Output

```
#show facility-protocol status
=============================================================================================================
Protocols Event           Interface               L-mpid Level Dir BD/VLAN/XCON  ID
Defect-Condition
=============================================================================================================
CFM    ENTER_AIS_INT    GigabitEthernet0/0/4     NA     NA    Up   NA           NA  AIS

CFM    ENTER_AIS        GigabitEthernet0/0/4     2      4     Up   XCON         NA  AIS

CFM    ENTER_AIS_INT    GigabitEthernet0/3/6     NA     NA    Up   NA           NA  AIS

CFM    ENTER_AIS        GigabitEthernet0/3/6     2      4     Up   XCON         NA  AIS

=============================================================================================================
Protocols Event            R-mpid Level EVC-NAME MA-NAME  Domain  MAC     Status Event-Code
=============================================================================================================
CFM    REMOTE_MEP_DOWN         1    NA   SEN_CFM  SEN_CFM  EVC      NA        UP   NA
CFM    REMOTE_MEP_UP           1    NA   SEN_CFM  SEN_CFM  EVC      NA        UP   NA
CFM    CROSSCHECK_MEP_UNKNOWN  1    NA   NA       SEN_CFM  EVC 0022.bdde.05be NA   NA
CFM    CROSS_CONN_SERVICE      1    4    NA       SEN_CFM  EVC 0022.bdde.05be NA   NA
CFM    CONFIG_ERROR            1    NA   NA       SEN_CFM  EVC 0022.bdde.05be NA   NA
```

EVPN PWs Output

```
#show facility-protocol status
=============================================================================================================
Protocols          EVPN-ID       Source       Target       Status
=============================================================================================================
```

```
EVPN-PWs            100           41           30           DOWN
```

Sensory Threshold Violations

```
#show facility-protocol status
=============================================================================================================
Protocols PhylIndex SenValue SenType SenScale SenPrecision ThresIndex SenThrValue PhyEntryName
=============================================================================================================
SENSOR_THRESH 1211 -103 14 9 1 1 -120 subslot 0/2 transceiver 0 Rx Power Sensor

SENSOR_THRESH 1211 -103 14 9 1 2 -140 subslot 0/2 transceiver 0 Rx Power Sensor

SENSOR_THRESH 1253 -400 14 9 1 3 -310 subslot 0/2 transceiver 3 Rx Power Sensor

SENSOR_THRESH 1253 -400 14 9 1 4 -330 subslot 0/2 transceiver 3 Rx Power Sensor

SENSOR_THRESH 1267 -370 14 9 1 3 -296 subslot 0/2 transceiver 4 Rx Power Sensor

SENSOR_THRESH 1267 -370 14 9 1 4 -310 subslot 0/2 transceiver 4 Rx Power Sensor

SENSOR_THRESH 2001 73 6 9 0 1 0 subslot 0/4 power Sensor 0
```

show facility-protocol status command

To backup the protocols syslog information by capturing the current status of the protocols on the system, use the **show facility-protocol status** command.

Syntax Description

Syntax Description:

There are no keywords.

Command Default

There is no default.

Command Modes

User EXEC (>) Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.1.x	Support for this command was introduced on ASR 900, ASR 920, and NCS 4200 Series.

Examples

```
Router# show facility-protocol status
=============================================================================================
Protocols      Peer-IP               VC-ID        VC-Status       VC-Error
=============================================================================================
PWs            10.0.0.146             2            ADMIN DOWN      NA
PWs            10.0.0.146             9            ADMIN DOWN      NA
PWs            10.0.0.146             10           ADMIN DOWN      NA
PWs            10.0.0.146             54           DOWN            NA
PWs            10.0.0.146             87           DOWN            NA
PWs            10.0.0.146             98           DOWN            NA
```