




Fault Management Administration Tasks



Note Advanced users can also use the Cisco EPN Manager Representational State Transfer (REST) API to access device fault information. For information on the API, click  at the top right of the Cisco EPN Manager window, then choose **Help > API Help**.

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Event Receiving, Forwarding, and Notifications

Cisco EPN Manager processes syslogs and SNMPv1, v2, and v3 traps that it receives from devices. The server automatically listens for these events on UDP port 162. You do not have to perform any event listening configuration on the server, but you do have to configure devices to forward traps and syslogs to Cisco EPN Manager on the appropriate port.

Notifications are forwarded in SNMPv2 or SNMPv3 format. They are also forwarded to email recipients when you setup corresponding Notification Policies. If you are adding a notification receiver with the notification type UDP, the receiver you add should be listening to UDP on the same port on which it is configured. Only INFO level events are processed for the selected category and alarms are processed with critical, major, minor and warning levels.



Note Notification receivers using SNMPv3 format must have unique usernames. If two or more notification receivers have the same username but different passwords, one of them will not function.

Cisco EPN Manager can forward alarms and events that are generated by the processing of received syslogs, traps, and TL/1 alarms to northbound notification receiver. Alarms of any severity can be forwarded, but only events with INFO severity can be forwarded. Information can be forwarded in :

- E-Mail format. See [Configure Default Settings for E-Mail Notifications, on page 9](#)
- SNMP trap format. See [Forward Alarms and Events as SNMP Trap Notifications, on page 8](#)

You can also use the SNMP trap notification mechanism to forward SNMP traps that indicate server problems. Alerts and events are sent as SNMPv2 and SNMPv3.

User Roles and Access Permissions for Configuring Alarm Notification Settings

This table describes the user roles and access permissions for configuring notification destination and creating customized notification policies.



Note Ensure that you enable the following Task Permissions for any user roles to view, create, and edit notification destination and notification policy:

- Notification Policies Read-Write Access under Alerts and Events
- Virtual Domains List

For more information, see [View and Change the Tasks a User Can Perform](#).

User Role	Access Permission
Root user with root domain	View, create, delete and edit notification destination and notification policy.
Root user with non-root domain	View notification destination and notification policy.
Admin user with root domain	View, create, delete and edit notification destination and notification policy.
Super user with root domain	View, create, delete and edit notification destination and alarm notification policy.
System monitoring user with root domain	View notification destination and notification policy.
Config manager with root domain	View notification destination and notification policy.
Admin user with non-root domain	View notification destination and notification policy created under their respective virtual domain.

User Role	Access Permission
Super user with non-root domain	View notification destination and notification policy created under their respective virtual domain.
System monitoring user with non-root domain	View notification destination and notification policy created under their respective virtual domain.
Config manager with non-root domain	View notification destination and notification policy created under their respective virtual domain.

Points to Remember While Adding a New Notification Policy

The following table lists few points you must remember when adding a new notification policy.


Category selected under Notification Policy Page	Points to Remember
Email	<ul style="list-style-type: none"> • Each virtual domain must have a unique Contact Name and email address (email recipient). • Email recipients can be added, modified, and deleted only from the ROOT-DOMAIN. • Same email address can be associated with multiple virtual domains. • Cisco EPN Manager does not use the Telephone Number, Cell Number, and Postal Address details for sending alarm notifications.
Trap Receiver	<ul style="list-style-type: none"> • Contact Name is unique for each trap receiver. • Trap receivers can be added, modified, and deleted only from the ROOT-DOMAIN. Trap receivers are applicable only in ROOT-DOMAIN. • North Bound trap receivers can receive alarms/events forwarded from the Notification Policy engine. • Guest-Access trap receivers will receive only alarms related to guest clients.

Category selected under Notification Policy Page	Points to Remember
<p>Notification Policy</p>	<ul style="list-style-type: none"> • Each notification policy consists of the following criteria: alarm categories, alarm severities, alarm types, device groups, notification destinations, and time range. • Each notification policy is associated with a unique virtual domain. • While selecting the required conditions, you can drill down the tree view drop-down list and select the individual categories (for example, Switches and Routers) and the severity (for example, Major). You can further select the specific Alarm types (for example, link down). • Alarms that match the criteria in a policy are forwarded to the respective notification destinations. • If an alarm is matched against multiple policies and these policies have the same destinations, only one notification is sent to each destination. • If the virtual domain associated with a notification policy is deleted, no alarm will match this policy. Though, this notification policy will be listed in the main Notification Policy page, you cannot modify or view the details of this notification policy. However, you can delete this policy. • If one or more device groups specified in a policy is deleted, no alarm will match this policy. Though, this notification policy will be listed in the main Notification Policy page, you cannot modify or view the details of this notification policy. However, you can delete this policy. • Alarms that are suppressed due to an existing alarm policy will not be forwarded to the notification destinations. • If a notification policy that includes both system and non-system category alarms in the rule criteria, you must select the device group(s) for the non-system category alarms. • The alarms generated in the specified duration alone are sent to the notification destination. For example, if you specify the duration as 8:00 to 17:00, the alarms will be notified from 8.00 a.m. to 5.00 p.m.

Configure Alarms Notification Destination

You can configure the email notification, Northbound trap receiver, and Restconf settings to notify the alarms generated by Cisco EPN Manager.

Step 1 Choose **Administration > Settings > System Settings > Mail and Notification > Notification Destination**.

Step 2 Click the  icon to create a new notification destination.

Step 3 To configure Email Destination, do the following:

- a) From the **Select Contact Type** drop-down list, choose **Email**.
- b) Enter the **Contact Name** in the text box.
- c) Enter a valid email ID in the **Email To** text box.
The email is sent to the email ID entered in the **Email To** field.
- d) Enter the **Contact Full Name**.
- e) Enter the **Telephone Number, Mobile Number, and Postal Address**.
- f) Click **Save**.

Step 4 To configure a Northbound trap receiver using IP Address, do the following:

- a) From the **Select Contact Type**, choose **Northbound Trap Receiver**.
- b) Select the **IP Address** radio button, and enter the **IP Address** and **Server Name**.
- c) Enter the **Port Number**, and choose the **SNMP Version**.
- d) If you choose the **SNMP Version** as **v2c**, enter the **Community** settings as required.
- e) If you choose the **SNMP Version** as **v3**, enter the **Username, Mode, Auth. Type, Auth. Password, Confirm Auth. Password, Privacy Type, Privacy Password, and Confirm Privacy Password**.
- f) Choose the required **Receiver Type** and **Notification Type**.
- g) Click **Save**.

Step 5 To configure a Northbound trap receiver using DNS, do the following:

- a) From the **Select Contact Type**, choose **Northbound Trap Receiver**.
- b) Select the **DNS** radio button and enter the **DNS Name**.
- c) Enter the **Port Number**, and choose the **SNMP Version**.
- d) If you choose the **SNMP Version** as **v2c**, enter the **Community** settings as required.
- e) If you choose the **SNMP Version** as **v3**, enter the **Username, Mode, Auth. Type, Auth. Password, Confirm Auth. Password, Privacy Type, Privacy Password and Confirm Privacy Password**.
- f) Choose the required **Receiver Type** and **Notification Type**.
- g) Click **Save**.

Step 6 To configure Restconf, do the following:

- a) From the **Select Contact Type**, choose **Restconf**.
 - b) Enter the **Destination Name**.
 - c) Choose the required **User Roles**.
 - d) Click **Save**.
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**Note**

- If you choose the **Receiver Type** as **Guest Access**, Cisco EPN Manager will not forward the alarms to the Northbound trap receiver using the notification policy. The Guest Access receiver receives only guest-client related events. The notification policy uses only Northbound trap receivers. Make sure that you use the same Engine ID and same auth and priv passwords when configuring the external SNMPv3 trap receiver.
- While updating the Notification Destination Trap Receiver, the operational status shows that the previous Trap Receiver status until the status is updated by the next polling.
- You can also navigate to Notification Policies page by choosing **ws2eszdxdxMonitor > Monitoring Tools > Notification Policies**.
- If recipient email id is configured in multiple Notification policies, alarm will be forwarded only once to the email id, when condition matches.
- You will not be allowed to delete Notification Destinations which are associated with Notification Policies.

Delete a Notification Destination

Follow this procedure to delete a Notification Destination.

Before you begin

You cannot delete a Notification Destination which is associated with a Notification Policy. Ensure that you have disassociated the Notification Destination from the Notification Policy. To do this, edit the Alarm Notification Policy and assign a different Notification Destination. See [Edit Alarm Notification Policies, on page 6](#) for more information.

**Note**

If a Notification destination is associated with multiple Notification policies, ensure that you have disassociated the Notification destination from all associated Notification policies.

Step 1 Navigate to **Administration > Settings > System Settings > Mail and Notification > Notification Destination**

Step 2 Select the Notification Destination you want to delete by selecting the check box next to it.

Step 3 Click the Delete icon.

Edit Alarm Notification Policies

You can add a new alarm notification policy or edit an existing alarm notification policy to send notifications on specific alarms of interest that are generated on particular device groups, to specific email recipients, northbound trap receivers, and restconf receivers.

**Note**

The restconf option is available only if the user enables the restconf option in **Administration > Settings > System Settings > Alarms and Events > Alarm And Events > Alarm other Settings**.

Step 1

Choose **Administration > Settings > System Settings > Alarms and Events > Alarm Notification Policies**. To add a new alarm notification policy, do the following:


- a) Click the **Add** icon.
- b) Choose the severity, category, and event condition for which the notifications must be triggered. By default all the severity types, categories, and conditions are selected.
- c) Click **Next** and choose the device groups for which you want the alarm notifications to be triggered.

The alarm notifications are triggered only for the device groups that you select.

For instance, if you select the **User Defined** device group type, then the alarm notification is triggered for all the configured user defined device groups. Similarly, if you select both the **User Defined** and **Locations** device group types, then the alarm notifications are triggered for all the configured user defined and location device groups.

Select the desired device group type to abstain from receiving insignificant alarm notifications from other device groups.


If you choose only system category alarms in the previous step, a message "Device Groups are not applicable when only 'System' based alarms are selected" is displayed under the **Device Group** tab. However, if you choose a nonsystem category alarm, you must select at least one device group.

- d) Click **Next** and choose the required destination in the **Notification Destination** page.
- e) Click  icon and enter the required details in the **Add Destination** window. You can choose either the **Email** or **Northbound Trap Receiver** or **Restconf** option under **Select Contact Type**.
- f) Click **Next** and enter the **Name** and **Description** for the alarm notification policy in the **Summary** page.
- g) Click **Save**.

Note "Interface" is a reserved word and hence don't use it as the name for Alarm Notification Policy.

Step 2

To edit an alarm notification policy, do the following:

- a) Choose the policy and click the  icon. The **Notification Policies** wizard appears.
- b) Choose the **Conditions**, **Device Groups**, and **Destination** as explained in Step 1.
- c) Click **Save**.

Convert Old Email and Trap Notification Data to New Alarm Notification Policy

The email and trap notification data created in previous Cisco Evolved Programmable Network Manager releases is converted into a new alarm notification policies while upgrading or migrating Cisco Evolved Programmable Network Manager from previous release to the latest version.

The migrated alarm notification policies can be viewed in the Alarms and Events Notification Policies pages.

The following Alarm categories are supported in Cisco Evolved Programmable Network Manager:

- Application Performance
- Change Audit
- Clients
- Compute Servers

- Context Aware Notifications
- Controller
- Generic
- Mobility Service
- Nexus VPC switch
- Performance
- SE Detected Interferers
- Security
- Switches and Routers
- System

The following Alarm categories are not supported in Cisco Evolved Programmable Network Manager:

- Adhoc Rogue
- AP
- Autonomous AP
- Cisco UCS Series
- Coverage Hole
- Mesh links
- Routers
- Rogue AP
- RRM
- Switches and Hubs
- Third Party AP
- Third Part Controller
- Wireless Controller

To edit the migrated alarm notification policies, see [Edit Alarm Notification Policies, on page 6](#).

Forward Alarms and Events as SNMP Trap Notifications

Cisco Evolved Programmable Network Manager can forward alarms and events in EPM-NOTIFICATION-MIB format as an SNMPv2c and SNMPv3 trap notifications. You can specify:

- A specific alarm or event category, such as **System** for internal server SNMP traps.
- All alarms in all severity will be forwarded. In case of *event*, only INFO severity events can be forwarded.

See [Configure Alarms Notification Destination, on page 5](#) for more information.

Configure Default Settings for E-Mail Notifications

If you have not configured the mail server, perform the instructions in [Set Up the SMTP E-Mail Server](#). Otherwise notifications will not be sent.

You can configure certain default settings that are applied across all alarm and event e-mail notifications. These settings can be overwritten when users configure individual notifications and receivers.

By default, the email subject line will include the alarm severity and category. The following settings are also available but are disabled by default.

- Subject line—Include the prior alarm severity or add custom text. Alternatively you can replace all of the subject line with custom text.
- Body of the email—Include custom text, the alarm condition, and a link to the alarm detail page.
- Secure message mode—Enabling this mode masks the IP address and controller name.

To enable, disable, or adjust these settings, choose **Administration > Settings > System Settings**, then **Alarms and Events > Alarms and Events**. Make your changes in the **Alarm Email Options** area.

Specify Alarm Clean Up, Display, and Email Options

The **Administration > Settings > System Settings > Alarms and Events** page enables you to specify when and how to clean up, display, and email alarms.

Step 1 Choose **Administration > Settings > System Settings > Alarms and Events > Alarms and Events**.

Step 2 Modify the **Alarm and Event Cleanup Options**:

- Delete cleared non-security alarms after—Enter the number of days after which non-security alarms are deleted. Non-security alarms include all alarms that do not fall under the Security or Adhoc Rogue categories.
- Delete cleared security alarms after—Enter the number of days after which Security and Adhoc Rogue alarms are deleted.
- Delete all (active & cleared) alarms after—Enter the number of days after which active and cleared alarms are deleted.
- Delete all events after—Enter the number of days after which all events are deleted.

The maximum limit is 4000000 events or the number of days specified, whichever is lower.

Step 3 Modify the **Syslog Cleanup Options**:

- Delete all Syslogs after—Enter the number of days after which all aged syslogs are deleted.
- Max Number of Syslog to Keep—Enter the number of Syslogs that needs to be maintained in the database.

Step 4 Modify the **Alarm Display Options** as needed:

- Hide acknowledged alarms—When this check box is selected, Acknowledged alarms do not appear in the Alarm page. This option is enabled by default. Emails are not generated for acknowledged alarms, regardless of severity change.

- Hide assigned alarms—When this check box is selected, assigned alarms do not appear in the Alarm page.
- Hide cleared alarms—When this check box is selected, cleared alarms do not appear in the Alarm page. This option is enabled by default.
- Show only Active Alarms in the Alarms tab - When this check box is selected, only Active Alarms appear in the Alarms list under Alarms tab.
- Add device name to alarm messages—Select the check box to add the name of the device to alarm messages.

Changes in these options affect the Alarm page only. Quick searches for alarms for any entity display all the alarms for that entity, regardless of the alarm state.

Step 5 Modify the alarm Failure Source Pattern:

- Select the category that you need to customize and click **Edit**.
- Select the failure source pattern in the options available and click **OK**.
- Select the category for which you want to customize the separator and click **Edit Separator**. Select one of the options available, then click **OK**.

The alarms generated for the selected category have the customized patterns set by you. For example, if you select the Clients category and edit the separator as #, then for any supported client alarm that is generated (**Monitor > Monitoring Tools > Alarms and Events**), the Failure Source column for that alarm will be *MACaddress #Name*.

Note Failure Source is not supported for custom traps, syslog generated events, and custom syslog translation.

Step 6 Modify the **Alarm Email Options**:

- Add Cisco EPN Manager address to email notifications—Select this check box to add the Cisco EPN Manager address to email notifications.
- Include alarm severity in the email subject line—Select this check box to include alarm severity in the email subject line. This option is enabled by default.
- Include alarm Category in the email subject line—Select this check box to include alarm category in the email subject line. This option is enabled by default.
- Include prior alarm severity in the email subject line—Select this check box to include prior alarm severity in the email subject line.
- Include custom text in the email subject line—Select this check box to add custom text in the email subject line. You can also replace the email subject line with custom text by selecting the Replace the email subject line with custom text check box.
- Include custom text in body of email—Select this check box to add custom text in the body of email.
- Include alarm condition in body of email—Select this check box to include alarm condition in the body of email.
- Include alarm application category data in body of email—Select this check box to include alarm category in the body of email.
- Add link to Alarm detail page in body of email—Select this check box to add a link to the Alarm detail page in the body of email.
- Enable Secure Message Mode—Select this check box to enable a secure message mode. If you select the Mask IP Address and Mask Controller Name check boxes, the alarm emails are sent in secure mode, where all the IP addresses and controller names are masked.

- **Email Send Interval**—Specify the time interval during which the email has to be sent.

Note Cisco EPN Manager sends alarm notification email for the first instance of an alarm and the subsequent notification is sent only if the alarm severity is changed.

Step 7 Modify the **Miscellaneous Settings**:

- **Controller License Count Threshold**—Enter a threshold percentage. An alarm is triggered if the number of access points connected to a controller reaches the specified rate of the licenses available on the controller. For example, if a controller is configured with 100 access point licenses and 80% threshold, an alarm will be triggered when the number of access points connected to a controller exceeds 80.
 - **Enable AP count threshold alarm**—Select this check box to enable the AP count for threshold alarms.
 - **Controller Access Point Count Threshold**—Enter a threshold percentage. An alarm is triggered if the number of access points connected to a controller reaches the maximum number of access points supported by the controller. For example, if a controller supports a maximum of 6000 access points and threshold is configured as 80%, an alarm will be triggered when the number of access points connected to the controller exceeds 4800.
 - **Suppress Interface Optical SFP TCAs in Admin Down State**—Selecting this check box prevents optical SFP TCAs to be raised for interfaces in the Admin Down state.
 - **Enable Service Impact Analysis**—Selecting this check box enables the service impact analysis.
 - **Enable creation of subtrees from a correlation tree when root cause of the tree clears**—When the root cause of a correlation tree clears, subtrees of this correlation tree are created, where each subtree has an uncleared root cause, selecting this check box enables this feature.
 - **Enable alarms from interface status polling**—If this check box is selected, LinkDown alarms will be raised and cleared by polling the interface status of Ethernet and Bundle Interfaces.
 - **Enable alarm generation based on EPNM inventory collection**—Cisco EPN Manager uses the inventory status of entities to raise and clear certain alarms. This mechanism acts as a backup for syslogs and traps, which may be lost or missing (due to the device not generating them, lost in network, and so on).
 - **Enable User Defined Field**—If this setting is enabled, PRODUCT_NAME and PRODUCT_ID are conditionally populated for Hardware Alarms in the Alarms list under the **Alarms** tab. This setting does not affect existing alarms and does not apply on previously raised alarms. This setting is disabled by default.
 - **Enable Event Throttle**—If this check box is selected, Cisco EPN Manager proactively drops events if the event count exceeds the threshold count (by default, more than 3600 events raised within 1 hour) for a device. See [Customize Event Throttle per Device, on page 17](#) for more information.
 - **Enable Alarms Cross Launch to SVO**—Select this check box to enable the cross launch to SVO nodal craft from Alarms table (**Monitor > Monitoring Tools > Alarms and Events**).
- Note** To avoid entering login credentials each time you navigate to SVO UI, enable Single Sign-on (SSO) from Cisco EPN Manager to SVO nodal craft. See [Enable Single Sign-on \(SSO\) from Cisco EPN Manager to SVO UI](#) for more information.
- **Enable Transient Condition Alarms**—If this check box is selected, then the Cisco EPN Manager processes transient events as alarms and displays these events in the **Alarms** table. By default, this check box is not checked.
 - **Enable Network Alarms View**—Selecting this option adds the tab **Network Alarms** under the **Alarms** tab. The **Network Alarms** tab lists all network impacting alarms. By default, this option is disabled.

- **Enable Notification Policy based filter for NBI WebSocket's Client**—Select this check box to enable restconf in the alarm notification policies to add the northbound WebSocket destination.
- **Max no. of Netconf Session Retry**—Enter the number of Netconf session attempts to connect and handle SVO faults.
- **Netconf Session Retry Interval**—Enter the time interval between retry attempts (in seconds), and to enable the Netconf session to handle any SVO faults.
- **Enable Device UDF to be sent in notifications**—Select this check box to enable alarm notifications for device UDFs.
- **Enable Not Alarmed (NA) Condition Alarms**—Select this check box to avoid events to be processed as alarms for optical devices.
- **Enable Alarms & Events Replay support for SVO Devices**—Select this check box to enable Netconf replays for SVO devices. This replays events that were lost during network connection failure, SVO switch over, device down time, or any other connection failure.
- **Duration for the Alarms & Events Replay for SVO Devices**—Enter the maximum time duration that you need for the alarms and events to be synced. The default option is 720 minutes or 12 hours. We recommend that you avoid entering a large time duration for this field.
- **Enable to suppress Alarms and Events for card/port in maintenance mode**—Select this check box to suppress any traps, alarms, or syslogs generated by a line card/port in maintenance mode.

Step 8 For Alarm Manager Settings, see [Configure Alarm Manager in Cisco IOS XR Devices, on page 13](#).
Step 9 Click **Save**.

Configure Global Display and Search Settings for Acknowledged, Cleared, and Assigned Alarms

The following table lists some display options for acknowledged, cleared, and assigned alarms. These settings *cannot* be adjusted by individual users (in their display preferences) because, for very large systems, a user could make a change that will impact system performance.

Other settings shown on the Alarms and Events page can be adjusted by users, but you can set the global defaults here. For information on those settings, see these topics:

- [Configure Default Settings for E-Mail Notifications](#)
- [Alarm, Event, and Syslog Purging](#)

Step 1 Choose **Administration > Settings > System Settings**, then choose **Alarms and Events > Alarms and Events**.
Step 2 Under the Alarm Display Options area, enable or disable these settings, as desired:

Alarm Display Options	Description	Does setting also affect search results?

Hide acknowledged alarms	Do not display Acknowledged alarms in the Alarms list or include them in search results	Yes
Hide assigned alarms	Do not display assigned alarms in the Alarms list or in search results	Yes
Hide cleared alarms	Do not display cleared alarms in the Alarms list or in search results For example, if there are 3900 cleared alarms out of 4000 alarms, enabling this setting will display 100 uncleared alarms in the Alarms list under Alarms > Showing Active Alarms . Note Cleared alarms remain viewable under the Cleared Alarms tab.	No
Show only Active Alarms in Alarms tab	Display only Active Alarms in the Alarms list under Alarms tab. For example, if there are 3900 cleared alarms out of 4000 alarms, enabling this setting will display the latest 4000 uncleared alarms in the Alarms list under Alarms > Showing Active Alarms . Note Cleared alarms remain viewable under the Cleared Alarms tab.	No
Add device name to alarm messages	Include device name in e-mail notifications	No

Step 3 To apply your changes, click **Save** at the bottom of the Alarms and Events window.

Configure Alarm Manager in Cisco IOS XR Devices

As part of reliable alarming, Cisco EPN Manager polls the Alarm Manager in Cisco IOS XR devices for any outstanding alarms or events.



Note Alarm Manager support is limited to Cisco IOS XR devices NCS 10xx, NCS 40xx and NCS 55xx only.

Follow this procedure to enable or disable the Alarm Manager from Cisco EPN Manager GUI.

Step 1 Choose **Administration > Settings > System Settings**, then choose **Alarms and Events > Alarms and Events**.

Step 2 Under **Manager Settings**, select the device type to enable or disable the Alarm Manager as required.

Note By default, Alarm Manager is enabled for all the device types listed under the **Manager Settings** area.

Step 3 Click **Save** to apply your changes.

Step 4 Click **Save** at the bottom of the Alarms and Events window.

If the Alarm Manager is enabled, Cisco EPN manager polls the device every 5 minutes. You cannot change this polling interval. All alarms raised by Alarm Manger are displayed in the list under **Alarms** tab in **Monitor >**

Monitoring Tools > Alarms and Events page. You cannot modify the Severity or Clear or Delete the alarms raised by Alarm Manager in this list. The source of the alarm is displayed as “Synthetic_Event” for alarms raised by the Alarm Manager,

If the Alarm Manger is disabled, all the alarms previously raised by Alarm Manager are cleared. Cisco EPN Manager will no longer poll the device but continues to receive alarms directly from the device. All PKT-INFRA-FM alarms will be listed under the **Events** tab in **Monitor > Monitoring Tools > Alarms and Events** page.

Configure Alarm Resync in Cisco IOS XE Devices

The alarm resync feature, based on the “show facility” command is part of reliable alarming for Cisco IOS XE devices. This feature is supported from software version 16.6.6vS and 16.9.1 in Cisco NCS 42xx devices. Follow this procedure to enable or disable the Alarm Resync from the Cisco EPN Manager GUI:

1. Choose **Administration > Settings > System Settings**, then choose **Alarms and Events > Alarms and Events**.
2. Under **Miscellaneous** tab, enable the option Enable Alarm ReSync for Cisco NCS42xx Devices.
3. Click **Save** to apply your changes.
4. Click **Save** at the bottom of the Alarms and Events window.

When the alarm resync is enabled, the alarms received from the device are displayed under Alarms tab in **Monitor > Monitoring Tools > Alarms and Events** page. You cannot modify the Severity or Clear or Delete these alarms through Cisco EPN Manager.



Note The alarm resync feature is supported only for DSX, SONET and select system alarms. Refer to [Cisco Evolved Programmable Network Manager Supported Syslogs](#) for more information.

The following procedure lists the steps to enable or disable the alarm manager in Cisco NCS 42xx devices from Cisco EPN Manager GUI.

Step 1 Choose **Administration > Settings > System Settings**, then choose **Alarms and Events > Alarms and Events**.

Step 2 Under **Manager Settings**, select the device type to enable or disable the Alarm Manager as required.

Note By default, **Alarm Manager** is enabled for all the device types listed under the Manager Settings area.

Step 3 Click **Save** to apply your changes.

Step 4 Click **Save** at the bottom of the Alarms and Events window.

Once you enable the alarm manager for Cisco NCS 42xx devices, you will be able to change the polling frequency.

Configure Alarm Profiling in Cisco IOS XE Devices

Cisco EPN Manager supports alarm profiling for Cisco IOS XE devices. Set `alarmprofileEnabled` to `true` for Cisco EPN Manager to reflect the alarm profiling changes. To do this:

Step 1 Open a CLI session with the Cisco EPN Manager server. See [Connect via CLI](#) for more information.

Step 2 Open the `/conf/fault/ncs42xx/resources/NCS42xxVersion.properties` file.

Step 3 Set `alarmprofileEnabled` to `true` and save your changes. By default, the `alarmprofileEnabled` is enabled.

Note If `alarmprofileEnabled` is set to false, Cisco EPN Manager does not reflect the alarm profiling changes.

Change Alarm Severity Levels

Each alarm in Cisco EPN Manager has a severity. The alarm severity is determined by the most severe event associated to the alarm. You can adjust the severity for alarms by changing the severity for newly generated events.



Note For alarms that are related to Cisco EPN Manager system administration, such as high availability, refer to [Customize Server Internal SNMP Traps and Forward the Traps](#).

For entsensor alarms, you must not change the default severity using the default severity configuration page.

You can change the severity level for network- and device-level alarms in two ways:

- Threshold-crossing alarms generated by optical, Carrier Ethernet, device health, or interface health monitoring policies—change the settings in the relevant monitoring policy. See [Change Thresholds and Alarm Behavior for a Monitoring Policy](#).
- Specific alarms—use the procedure in this section.

Step 1 Choose **Administration > System Settings**, then choose **Alarms and Events > Alarm Severity and Auto Clear**.

Step 2 Expand the categories available under the **Alarm Condition** column, or search for the Alarm Condition you want by entering all or part of the event text in the **Alarm Condition** search field just below the column heading.

Step 3 Select the events and set their new severity.

- a) Check the event's checkbox.
- b) Choose a severity level from the **Severity** drop-down list and click **Save**.

Note For a **Custom Syslog**, the **Severity Level** changed under the **Alarm Severity and Auto Clear** page will not be reflected under the **Alarms and Events >> Syslog** tab.

Customize the Troubleshooting Text for an Alarm

You can associate troubleshooting and explanatory information with an alarm so that users with access to the Alarms and Events tables will be able to see it. Use this procedure to add or change the information that is displayed in the popup window.

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- Step 1** Choose **Administration > Settings > System Settings**, then choose **Alarms and Events > Alarm Severity and Auto Clear**.
- Step 2** Select an alarm, then click **Recommended Action**.
- Step 3** Add or change the content in the **Explanation** and **Recommended Actions** fields, then click **Save**. To revert to the default text, click **Reset** and **Save**.
-

Change Alarm Auto-Clear Intervals

You can configure an alarm to clear automatically after a specific period. This is helpful in cases, for example, where there is no clearing event. Auto clearing an alarm will not change the severity of the alarm's correlated events.

You can set the auto clear duration in intervals of 5 minutes, up to a duration of 55 minutes. Beyond this time, you can set an interval in multiples of an hour or 60 minutes.



-
- Note**
- When you enable alarm auto clear, at times there may be a delay in clearing the created alarms.
 - When you set an auto clear interval that is less than an hour, it may affect the system performance.
-

-
- Step 1** Choose **Administration > Settings > System Settings**, then choose **Alarms and Events > Alarm Severity and Auto Clear**.
- Step 2** Expand the categories available under the **Event Types** column, or search for an event type by entering all or part of the event text in the **Event Types** search field below the column heading.
- Step 3** To change the auto clear duration, select one or more events and click the **Alarm Auto Clear** button.
- Step 4** Click **Ok** to save the auto clear time duration.
-

Change the Information Displayed in the Failure Source for Alarms

When an alarm is generated, it includes information about the source of the failure. Information is presented using a specific format. For example, performance failures use the format *MACAddress:SlotID*. Failure sources

for other alarms may include the host name, IP address, or other properties. Adjust the properties and separators (a colon, dash, or number sign) that are displayed in the alarm's failure source using the following procedure.

-
- Step 1** Choose **Administration > Settings > System Settings**, then choose **Alarms and Events > Alarms and Events**.
- Step 2** In the Failure Source Pattern area, select the alarm category you want to customize.
- Step 3** Adjust the failure source format as follows:
- To customize the *properties* that are displayed, click **Edit**, select the properties, then click **OK**. If a property is greyed-out, you cannot remove it.
 - To customize the *separators* that are displayed between the properties, click **Edit Separator**.
- Step 4** To apply your changes, click **Save** at the bottom of the Alarms and Events settings window.
-

Customize Event Throttle per Device

Cisco EPN Manager proactively drops events once the number of events raised by a device exceeds a threshold value. The event processing resumes once a lower threshold is reached.

By default, Cisco EPN Manager proactively drop events from a device if there are more than 3600 events raised within 1 hour. The event processing resumes once the event count comes down to 3000. To enable Event Throttle check box:

1. Navigate to **Administration > Settings > System Settings > Alarms and Events > Alarms and Events**.
2. Select the **Enable Event Throttle** check box.

Once the Event Throttle checkbox is enabled, the default value will be considered.

Event Throttle for the System

Cisco EPN Manager checks for network congestion by setting an event throttle to check events at the system level.

If the queue occupancy in the network increases beyond 60%, it starts to drop events. In such a scenario, you see the following message:

The system event processing queue has reached the configured upper threshold value. Please check for sustained high network event rate to avoid dropping of events.

If the queue occupancy in the network reaches its complete capacity, you see the following message:

The system event processing queue is full and oldest events from the queue will be dropped. Please find the details of the dropped events in assurance_fault.log.

In both the scenarios, we recommend that you check for network outage or factors responsible for an excessive amount of incoming network events.

Note that the upper threshold percentage value is set at 60% of the queue capacity after which an alarm gets generated. When the system reaches the lower threshold percentage of 30%, the alarm gets cleared.

Change the Behavior of Expedited Events

When Cisco EPN Manager receives a configuration change event from a device, it waits for a certain time interval before starting inventory collection, in case other related events are sent. This prevents multiple collection processes from running at the same time. This is called the *inventory collection hold off time* and is set to 10 minutes by default. This setting is controlled from the Inventory system settings page (**Administration > Settings > System Settings > Inventory**).

The following events are processed by Cisco EPN Manager within the default time interval of 10 minutes:

Type	Supported Events
Link	LINK-3-UPDOWN
Card Protection	CARD_PROTECTION-4-PROTECTION CARD_PROTECTION-4-ACTIVE
VLAN	PORT_SECURITY-6-VLAN_REMOVED PORT_SECURITY-6-VLAN_FULL
ICCP SM	L2-L2VPN_ICCP_SM-4-REMOTE_CORE_ISOLATION L2-L2VPN_ICCP_SM-4-REMOTE_CORE_ISOLATION_CLEAR L2-L2VPN_ICCP_SM-3-CONFIG_LOCAL_ERROR L2-L2VPN_ICCP_SM-3-CONFIG_REMOTE_ERROR L2-L2VPN_ICCP_SM-4-LOCAL_CORE_ISOLATION L2-L2VPN_ICCP_SM-4-LOCAL_CORE_ISOLATION_CLEAR L2-L2VPN_ICCP_SM-4-PEER_REACHABILITY_FAILURE L2-L2VPN_ICCP_SM-4-PEER_REACHABILITY_CLEAR L2-L2VPN_ICCP_SM-4-REMOTE_ACCESS_MAIN_PORT_FAILURE L2-L2VPN_ICCP_SM-4-REMOTE_ACCESS_MAIN_PORT_FAILURE_CLEAR INFRA-ICCP-5-ISOLATION INFRA-ICCP-5-ISOLATION_CLR INFRA-ICCP-5-NEIGHBOR_STATE_UP INFRA-ICCP-5-NEIGHBOR_STATE_DOWN INFRA-ICCP-6-BACKBONE_INTERFACE_STATE_UP INFRA-ICCP-6-BACKBONE_INTERFACE_STATE_DOWN L2-BM-6-ACTIVE_CLEAR L2-BM-6-ACTIVE_PROBLEM L2-L2VPN_ICCP_SM-3-CONFIG_INVALID_NODEID L2-L2VPN_ICCP_SM-3-CONFIG_INVALID_NODEID_CLEAR
Satellite	PKT_INFRA-ICPE_GCO-5-SATELLITE_STATUS_PROBLEM PKT_INFRA-ICPE_GCO-5-SATELLITE_STATUS_CLEAR
Cluster	PLATFORM-REDDRV-7-ROLE_CHANGE PLATFORM-CE_SWITCH-6-UPDN PLATFORM-CLUSTER_CLM-6-UPDN LINK_UP LINK_DOWN
Celeborn cards	UEA_SPA_MODE-6-UEA_SPA_MODE_CHG
Configuration Commit syslogs	MGBL-CONFIG-6-DB_COMMIT SYS-5-CONFIG_I

However, in case of the following critical events, Cisco EPN Manager performs a full discovery of the device immediately when the event occurs:

```

SYS-5-RELOAD
SYS-5-RESTART
OIR-6-INSCARD
OIR-SP-6-INSCARD
SWT_CEFC_STATUS_CHANGE
cefcFRURemoved
cefcFRUInserted
    
```

Granular Inventory Event Flow Controllers

Granular inventory identifies the events generated and processes only the changes made in the devices. To avoid continuous syncing of devices due to event inflow, granular inventory uses Event Burst Flow Controller and Continuous Events Flow Controller.

Event Burst and Continuous Events are configurable only from the `/opt/CSColumos/conf/fault/correlationEngine/CE-EventBasedInventoryRules.xml` file.

Event Burst Flow Controller

When the number of incoming events for any technology for a managed device is greater than the threshold (BurstThreshold for BurstHoldOffTimer), Cisco EPN Manager considers it as an event burst condition. In this scenario, the granular inventory sync for the events breaching the threshold is held for a certain time period (BurstHoldOffTimer) until the event burst condition is cleared. This condition check is repeated at regular intervals. After the specified number of retries (BurstCheckRetryCount), if the threshold is still breached, Cisco EPN Manager stops all the granular inventory processing for the device.

If the event burst condition is detected and cleared before 3 retries, then the Event Burst Flow Controller triggers feature sync for the corresponding technology. If the event burst condition is detected and continues after 3 retries, then the controller stops all the granular inventory processing, raises the `DISABLE_GRANULAR_INVENTORY_EVENT` event, and disables the granular inventory for the device.

Table 1: Event Burst Action Properties

Property Name	Description	Default Value
BurstThreshold	The number of events of a given type over a period of time, which is considered as the ‘burst’ of that event type.	100 (events)
BurstHoldOffTimer	The time period for which the inventory sync is withheld.	300000 ms (5 mins)
BurstCheckRetryCount	The permitted number of retries.	3 (times)

After the granular inventory is disabled, a system check is initiated to monitor the event burst condition for the specific device; this system check will identify if the event burst condition continues. If there is no event burst condition, then it clears `DISABLE_GRANULAR_INVENTORY_EVENT`, followed by a full sync of the device. The granular inventory processing for the device will resume for any new incoming events.



Note When you enable the granular inventory for the device manually (see [Enable or Disable Granular Inventory, on page 20](#)), the corresponding DISABLE_GRANULAR_INVENTORY_EVENT is cleared.

Continuous Events Flow Controller

When the number of incoming events for a managed device is greater than the threshold (contEventsThresholdCount for contEventsCheckPeriod), Cisco EPN Manager considers it as continuous events condition. In this scenario, the granular inventory sync for the events breaching the threshold is held for a certain time period (contEventsDropPeriod) until the continuous events condition is cleared.

If the continuous events condition is detected, then the Continuous Events Flow Controller stops all the granular inventory processing for the device and raises the INVENTORY_SYNC_SUPPRESSED alarm to indicate that the device is in continuous state. It continues to perform feature sync at regular intervals, for all the events identified, until the continuous events condition is cleared.

Table 2: Continuous Event Action Properties

Property Name	Description	Default value
contEventsThresholdCount	Maximum number of allowed events at a time in the queue.	50 (events)
contEventsCheckPeriod	The time interval in milli-seconds, to check for the incoming event count.	300000 ms (5 mins)
contEventsDropPeriod	Time interval in milli-seconds, to trigger feature sync at regular intervals in case of continuous events.	300000 ms (5 mins)

Enable or Disable Granular Inventory

You can enable or disable granular inventory at the global level from the System Settings page. Choose **Administration > Settings > System Settings > Inventory > Inventory**, and then check or uncheck the **Enable Granular Inventory** check box. By default, this setting is enabled.



Note Disabling granular inventory will stop all the granular inventory processing for all the managed devices.

You can also enable or disable the granular inventory at the device level from the Network Devices page. To disable granular inventory for a device, select the required device in the Network Devices page, and then choose **Admin State > Disable Granular Inventory**. This will disable the granular inventory for the selected device only, and will not impact the granular inventory processing of any other devices in the system. To re-enable granular inventory for a device, select the required device in the Network Devices page, and then choose **Admin State > Enable Granular Inventory**. You can select one or more devices, and apply these actions. However, in case of multiple device selection, all the selected devices should be in either of the two states. If the selected devices are in mixed states, these options are not enabled.



Note If the granular inventory is disabled at the global level, then it precedes the granular inventory settings at the device level. If the granular inventory is enabled at the global level, then it succeeds the granular inventory settings at the device level.

Customize Generic Events That Are Displayed in the Web GUI

You can customize the description and severity for generic events generated by SNMP traps and syslogs. Your customization will be displayed in the Events tab for SNMP trap events. If a MIB module is not loaded, you can load it manually and then customize the notifications provided in that MIB.

See [Customize Generic Events Based on SNMP Traps, on page 22](#), for information on how to customize these generic events.

Disable and Enable Generic Trap and Syslog Handling

By default Cisco Evolved Programmable Network Manager does not drop any received syslogs or traps. It maintains an event catalog that determines whether Cisco Evolved Programmable Network Manager should create a new event for incoming syslogs or traps (and if it creates a new event, whether it should also create an alarm). If Cisco Evolved Programmable Network Manager does not create an event, the trap or syslog is considered a *generic event*.

By default, Cisco Evolved Programmable Network Manager does the following:

- Displays the generic events in the Events list.
- Forwards generic events in e-mail or SNMP trap notifications, after normalizing them using CISCO-EPM-NOTIFICATION-MIB. For more information, refer to the CISCO-EPM-NOTIFICATION-MIB section in the guide.

All of these events are assigned the MINOR severity, regardless of the trap contents, and fall under the alarm category Generic.

Disable and Enable Generic Trap Processing

Use the `genericTrap.sh` command to manage generic syslogs.

To do the following:	Use this command:
Turn off generic trap processing	<code>/opt/CSColumos/bin/genericTrap.sh -l</code>
Turn on generic trap processing	<code>/opt/CSColumos/bin/genericTrap.sh -u</code>

Customize Generic Events Based on SNMP Traps

Cisco EPN Manager supports the customized representation of generic events in the GUI. Managed objects normally generate SNMP traps and notifications that contain an SNMP trap object identifier (SnmpTrapOID) and a variable bind object identifier (VarBindOIDs) in numerical format. Cisco EPN Manager translates the numeric SnmpTrapOIDs and VarBindOIDs into meaningful names using customized MIB modules, then displays the generic events in the web GUI (in the event tables, Device 360 view, and so forth). For more details on Generic Events see [How are Alarms and Events Created and Updated?](#).

Using the SNMP MIB files that are packaged with Cisco EPN Manager, you can customize the defined MIBs for your deployment's technology requirement.

The following table illustrates how ObjectIDs are decoded and displayed in the GUI.

Table 3: Example: ObjectID Representation

OIDs before Decoding	OIDs after Decoding
snmpTrapOID = 1.3.6.1.4.1.9.10.120.0.1', Values: 1.3.6.1.4.1.9.10.119.1.1.2.1.11.7.1=1	mplsL3VpnVrfDown, values: mplsL3VpnVrfOperStatus.("vrf1").(1) = 1

Follow the steps below to create customized generic events.

-
- Step 1** Select **Monitor > Monitoring Tools > Alarms and Events**.
 - Step 2** Click the **Events** tab.
 - Step 3** Click **Custom Trap Events** and then click **Add**.
 - Step 4** In the **Add New Custom Trap Events** window,upload a MIB file and enter the required details.
 - Step 5** If you upload a new MIB file, wait until the file upload is complete, and then click **Refresh MIBs** to have the newly added MIB included in the **MIB** drop-down list.
 - Step 6** Click **OK**.
Cisco EPN Manager creates a new event type and alarm condition for the specified trap.
-

Troubleshoot Fault Processing Errors

If your deployment has fault processing problems, follow this procedure to check the fault logs.

-
- Step 1** Log in to Cisco EPN Manager with a user ID that has Administrator privileges.
 - Step 2** Select **Administration > Settings > Logging**, then choose the **Global Settings** tab.
 - Step 3** Click **Download** to download all the server log files.
 - Step 4** Compare the activity that is recorded in these log files with the activity that you see in your management application:
 - console.log
 - ncs-x-x.log

decap.core.java.log

xmp_correlation.log

decap.processor.log

Note You will not be able to reset the Global Settings by clicking **Reset** from Cisco EPN Manager.
