



Monitoring System Activity

This section describes how to monitor IoT FND system activity, including the following topics:

- [Quick Start for New Installs](#)
- [Using the Dashboard](#)
- [Monitoring Events](#)
- [Monitoring Issues](#)
- [Viewing Device Charts](#)

Quick Start for New Installs

Quick Start for New Installs prompts you for information to determine the appropriate deployment.

No Devices or licenses are added during the Quick Start Process.

When you first open a new install of FND software, the DASHBOARD page appears and you select QUICK SETUP.

1. At first login, as a root user, click **Dashboard**. A No Devices or Dashlets panel appears, which displays the following options: ADD LICENSE, ADD DEVICES, ADD DASHLET and GUIDED TOUR.
2. Click GUIDED TOUR.

Note: You may need to add a license or create a dummy device to enable the Guided Tour. The Guided Tour feature **must be** enabled by the first-time FND root user that logs into the FND system before you can use the feature.

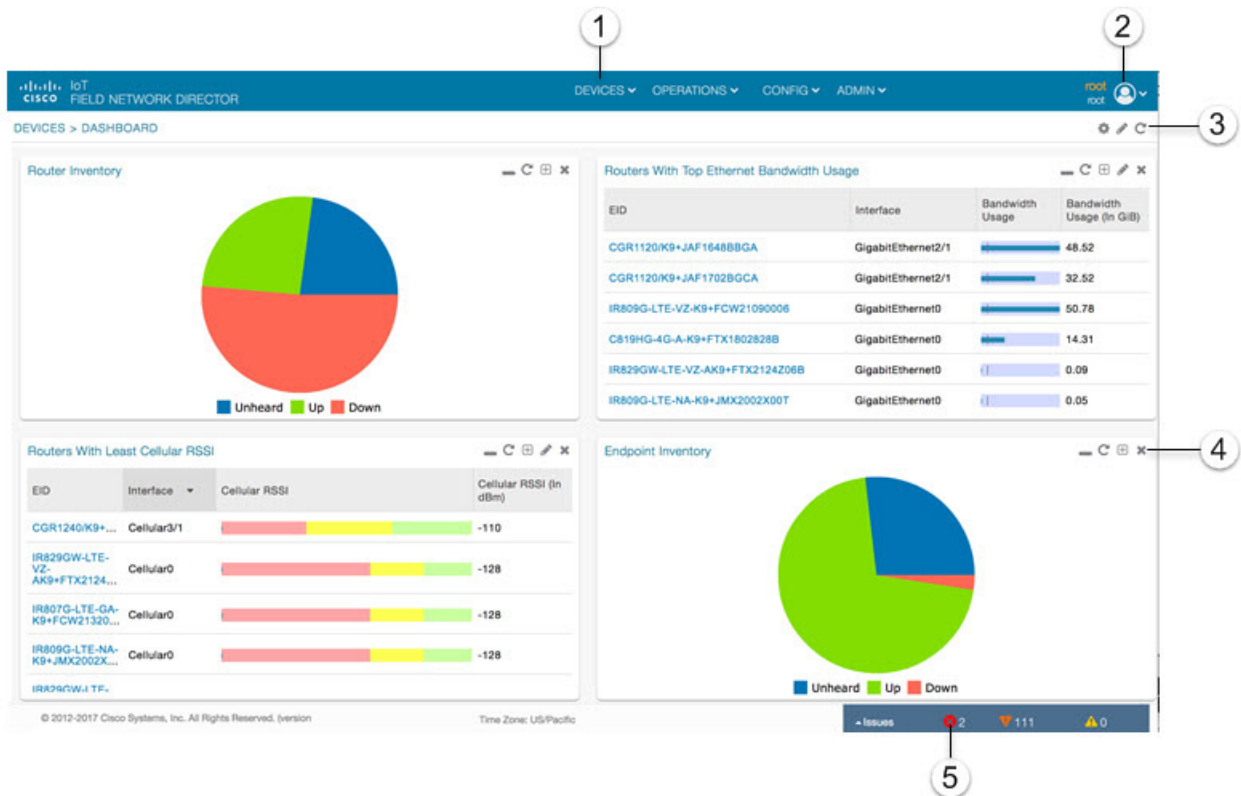
3. At the root user menu (upper-right corner) that appears, select **Guided Tour**. This opens a Guided Tour Settings window that lists all available Guided Tours:
 - Add Devices
 - Device Configuration
 - Device Configuration Group Management
 - Tunnel Group Management
 - Tunnel Provisioning
 - Provisioning Settings
 - Device Configuration and Device Groups
 - Firmware Update
4. After you select one of the Guided Tours, you will be redirected to that configuration page and windows appear to step you through the configuration steps and let you Add or Update Values as necessary.

Note: When you select the Zero Touch Provisioning option list in step 3 above, a Zero Touch Provisioning setup guided tour window appears that lists all the prerequisites for the device on-boarding: (Provisioning Settings, Group Management, Manage Configuration: Bootstrap Template, Tunnel Provisioning, Device Configuration, Add Devices).

Using the Dashboard

The IoT FND Dashboard (Figure 1) displays *dashlets* to provide a visual overview of important network metrics for a device. Click **Device > Dashboard** to view.

Figure 1 IoT FND Dashboard



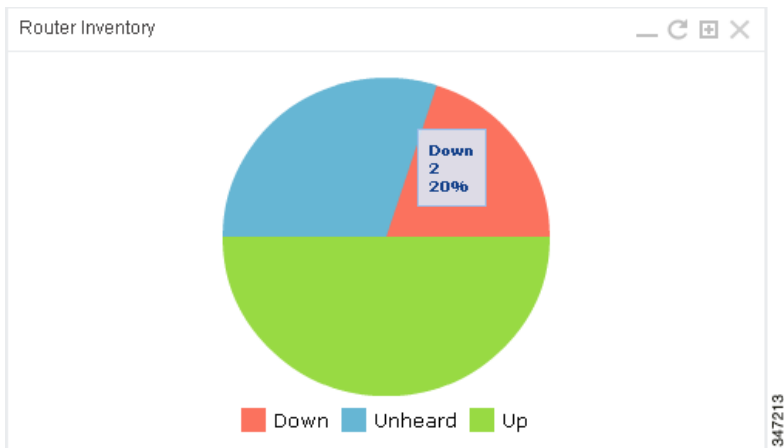
1	<p>Menu and Submenu tabs.</p> <p>Roll over the Menus to display Sub-menus, which display as tabs below the main menus.</p>	5	<p>Dashlet action buttons (left to right):</p> <ul style="list-style-type: none"> ■ Minimize (close) dashlet window. ■ Refresh dashlet. ■ Export data. ■ Filter (not available on all pages) ■ Close dashlet.
2	<p><user name> menu</p> <ul style="list-style-type: none"> ■ Preferences: Sets display settings of the user interface. ■ Switch Domain. ■ Change Password. ■ Time Zone. ■ Log Out. 	6	<p>Issues Status bar.</p> <p>Summary of issues by devices (routers, head-end routers, servers, endpoints) and their severity (critical, major, minor).</p> <p>Viewing Device Severity Status on the Issues Status Bar</p>
3	<ul style="list-style-type: none"> ■ Dashboard Settings-Allow you to set the refresh rate for the page and Add Dashlets to the Dashboard. ■ Filter-Allows you to define custom filters. You can also define time periods for the filter. ■ Refresh page. 	7	<p>Line Graphs: Zoom In, Zoom Out, View All Options.</p> <p>Right click on a line graph dashlet and select Zoom in or Zoom Out to modify the number of days that display on the graph.</p> <p>Right click on View All to show the default display.</p>
4	<p>User-Defined Charts.</p> <p>For some user-defined charts, you can select how the data displays. Options are Bar or Pie.</p>		

This section describes the following Dashboard features:

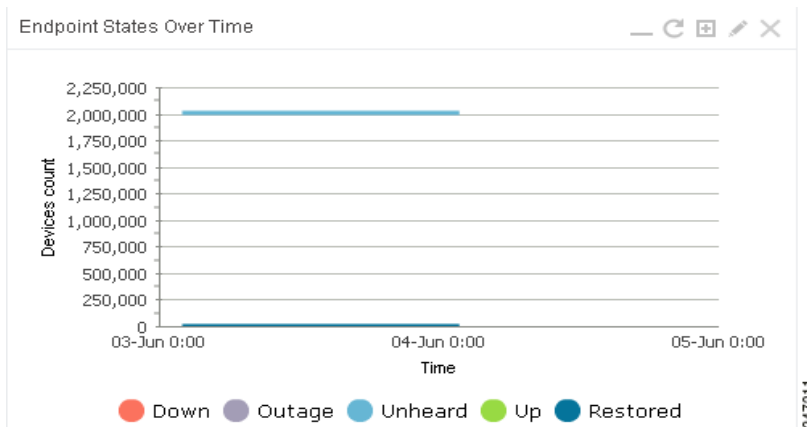
- [Types of Dashlets](#)
- [Repositioning Dashlets](#)
- [Setting the Dashlet Refresh Interval](#)
- [Adding Dashlets](#)
- [Removing Dashlets](#)
- [Exporting Dashlet Data](#)

Types of Dashlets

The Dashboard displays three types of dashlets for a selected device:

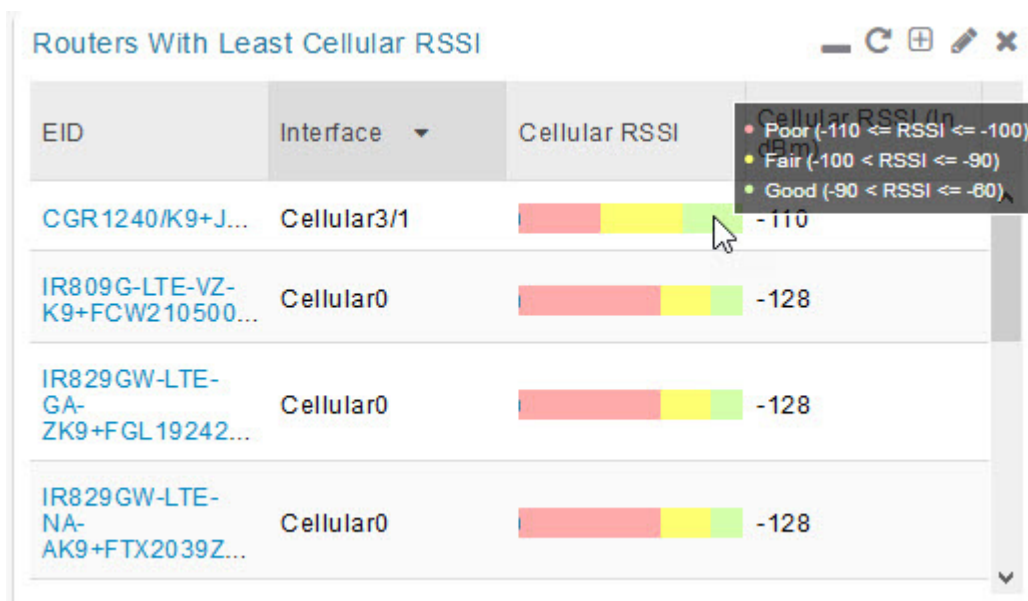


- Pie-chart dashlets display a ratio of device properties as a pie chart.



- Line-graph dashlets display graphs that show device counts over time.

Tip: Graphs set to intervals longer than one day may not display the data at the last datapoint exactly as shown in the matching field on the Device Info page. This is because data aggregation is occurring less frequently than polling done to update the fields on the Device Info page. Set these graphs to the 6h or 1d intervals to update the data more frequently. Use intervals longer than one day to view data trends.



- Bar charts show percentages of a whole

Customize Dashboard Dashlets

At the upper-right corner of the **Devices > Dashboard** page, you can:

- Click the Dashboard Settings (cog) button to Add Dashlets and Set Refresh Interval for all active dashlets.
- Click the pencil icon to Add or Remove a Filter for a device.
- Click Refresh icon to refresh the dashlet.

At individual dashlets you can:

- Click the dash (-) icon to minimize the dashlet.
- Click the Refresh icon to refresh the dashlet.
- Click the (+) icon to export data (.csv format) from the dashlet.
- Click the filter icon (pencil icon) to: (Options vary by dashlet type):
 - Define reporting intervals by selecting defined periods such as (6h, 1d, 1w, 4w), Last Billing Period and Current Billing Period, or define your own Custom time period.
 - Define a Series Selector, which allows you to define different possible states for a chart. For example, the Endpoint Config Group Mismatch Over Time chart has the following Series Selector options: Config Out of Sync and Config in Sync. Clicking the Series Selector option names on the chart can cause the data to display or not display on the chart. When not selected, a name appears in a faded hue on the chart.
 - Use drop-down menus found in some table headings to display data in an ascending or descending order or display an additional heading option (such as Down Routers Over Time) in the table.
 - Define the number of entries that display on the chart by selecting a value from the Show drop-down menu.
 - Display data as either a bar chart or pie chart.

- Define a custom line-graph chart. Select the number of devices to chart for line-graph chart displays.
- Select a series to refine data in line-graph chart displays.
- Filter line-graph chart displays by group.
- Add a Filter
- Click (X) to close the dashlet.

Pre-defined Dashlets

The IoT FND Dashboard dashlets are described in the table below.

Dashlet	Description
Config Group Template Mismatch	This pie chart shows the number of devices with matched and mismatched configuration group templates. (Chart applies only to mesh endpoint configuration groups).
Devices with interfaces enabled but down	This gauge chart displays the count of devices that have interfaces that are enabled but down and the count of interfaces. To display this dashlet, click add (Operation column) at the Dashboard Settings page, and then define the device type and interface (such as Type:cgr1000, Interface:Async 1/1) and save your entries. Once the dashlet is on the Dashboard, click the needle of the gauge chart to launch the Device Details list page that shows all devices that meet the criteria of having enabled, but down interfaces.
Distribution of modulations across meters	This line graph shows the distribution of modulations across meters. Modulations graphed: 8PSK, QPSK, BPSK, ROBO, OFDM600, OFDM200, FSK150, QPSK12.5.
Endpoint Config Group Template Mismatch Over Time	This line graph shows the number of endpoints across all configuration groups and particular configuration groups that are out of sync for the configured time interval.
Endpoint Firmware Group Membership Mismatch Over Time	This line graph shows the number of endpoints across all firmware groups and particular firmware groups that are out of sync for the configured time interval.
Endpoint Inventory	This endpoint status displays the proportion (and count) of endpoints. For example, the count of devices with an Unheard status relative to the other states: Registering, Up, Down, and Outage.
Endpoint States Over Time	This line graph shows a count of endpoints and their states for the configured time interval. States shown: Registering, Down, Outage, Unheard, Up, Restored, Unmanaged.
Firmware Group Membership Mismatch	This pie chart shows the number of devices with mismatched firmware groups (applicable only to endpoint firmware groups).
Hop Count Distribution	This pie chart shows the hop count distribution for mesh devices.
RF and PLC Media Utilization Over Time	This pie chart summarizes active PLC and RF mesh devices on CGR 1000 and IR800 routers over a user-defined period of time (6h, 1d, 1w or custom).

Dashlet

Router Inventory

Router States Over Time

Description

This pie chart shows a router count and its percentage of the whole by the following states: Unheard, Up, Down.

This line graph shows the state of all routers over a configured time interval. States supported: Up, Down, Unmanaged, Unsupported and Unheard.

Use the **Add Filter** button to track:

- Specific router (Type)
- Router Configuration Groups
- Router Firmware Groups

Routers With Top Cellular Bandwidth Usage

This bandwidth chart displays the following information for the top n routers: EID, Interface, Bandwidth Usage and Bandwidth in Usage (in Bytes) for a router per the defined filter. The filter defines possible time periods (6h, 1d, 1w, 4w, Custom, Last Billing Period) to display. To define the filter, click the pencil icon.

Note: You must define the Monthly Cellular Billing Period Start Day for the Last Billing Period option at the following page: **Admin > System Management > Server Settings > Billing Period Settings**.

Routers With Top Ethernet Bandwidth Usage

This bandwidth chart displays the following information for the top n routers: EID, Interface, Bandwidth Usage and Bandwidth in Usage (in Gigabits) for a router per the defined filter. The filter defines possible time periods (6h, 1d, 1w, 4w, Custom, Last Billing Period) to display. To define the filter, click the pencil icon.

Note: You must define the Monthly Ethernet Billing Period Start Day for the Last Billing Period option at the following page: **Admin > System Management > Server Settings > Billing Period Settings**.

Routers With Least Cellular RSSI

This dashlet displays a chart of routers with the lowest RSSI values at the last poll, which indicates the quality of the signal strength and identifies each cellular interface. Use this chart to gauge the cellular channel conditions for routers.

Dashlet

Service Providers with Maximum Down Routers for Cellular 1

Description

This dashlet shows the service provider names, their associated cell IDs (if available), their associated total router count, the count of down routers, and a sparkline showing the down routers over time (when you select the option per Tip noted below).

This dashlet displays the aggregated maximum Down Routers for device types CGR1000, C800, and IR800 for single modem routers.

Tip: Move your cursor over any column heading to display the Down Routers Over Time listings in either ascending or descending order.

Service Providers with Maximum Down Routers for Cellular 2

This dashlet shows the service provider names, their associated cell IDs (if available), their associated total router count, the count of down routers, and a sparkline showing the down routers over time (when you select the option per Tip noted below).

This dashlet displays the aggregated maximum Down Routers for device types CGR1000, C800, and IR800 for dual modem routers.

Tip: Move your cursor over any column heading to display listings in either ascending or descending order or to display the Down Routers Over Time column.

Repositioning Dashlets

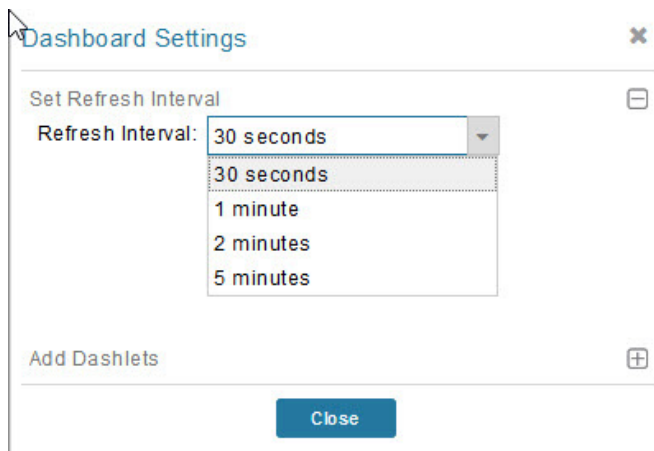
You can configure the Dashboard to display charts in your preferred arrangement.

- Click and drag the title bar of a chart to the desired position.
- Click (x) within a chart to remove the chart from the page.
- Collapse a dashlet to display only its title bar (such as Endpoint Inventory) by clicking the Minimize button (-).
- To refresh a dashlet, click its **Refresh** button.

Setting the Dashlet Refresh Interval

To set the refresh interval for dashlets:

1. Choose **DEVICES > Dashboard**.
2. Click the Dashboard **Settings** button (cog icon).
3. Click **Set Refresh Interval**.



4. From the drop-down menu, choose a refresh interval.
5. **Close** the Dashboard Settings dialog box when finished.

Adding Dashlets

To add dashlets to the Dashboard:

1. Choose **DEVICES > Dashboard**.
2. Click the **Settings** button (cog icon) in the upper-right hand corner of the page.
3. Click **Add Dashlets (+)**.

Note: No dashlets display in this dialog box if all are displaying on the Dashboard.

4. To add a listed dashlet to the Dashboard, select the name of dashlet.
5. Close the Dashboard Settings dialog box by clicking (x) in upper-right corner of panel when finished.

Removing Dashlets

To remove dashlets from the Dashboard:

1. Choose **DEVICES > Dashboard**.
2. Close the dashlet by clicking (X) in the upper-right corner of the panel.

Using Pie Charts to Get More Information

Roll over any segment of a pie chart to display a callout with information on that segment.

Click the Router Inventory and Mesh Endpoint Inventory pie charts to display the devices in List View.

Setting Dashlet Time Properties

To specify the time interval for data collection for line-graph dashlets, click the interval icon (a pencil icon), in the title bar to display the **6h**, **1d**, **1w**, **4w**, or **Custom** buttons on the dashlet. The **6h** button sets the data-collection time interval to the last six hours. The **1d** button sets the time interval to the last 24 hours.

1. Click **Custom**.
2. In the window that appears, select the time frame using the **From and To** fields. Click **OK**.

Collapsing Dashlets

Click the minimize icon (-) at the upper-right of the dashlet window to hide the window.

Using the Series Selector

You use the Series Selector to refine line-graphs to display by device status. The device options are:

- Routers: Down, Outage, Unsupported, Unheard, and Up
- Mesh Endpoint Config Group: Config Out of Sync and Config In Sync
- Mesh Endpoint Firmware Group: Membership Out of Sync and Membership In Sync
- Mesh Endpoint States: Down, Outage, Unheard, and Up

To use the Series Selector:

1. Click **Series Selector**.
2. In the **Series Selector** dialog box, check the check boxes for the data series to show in the graph.

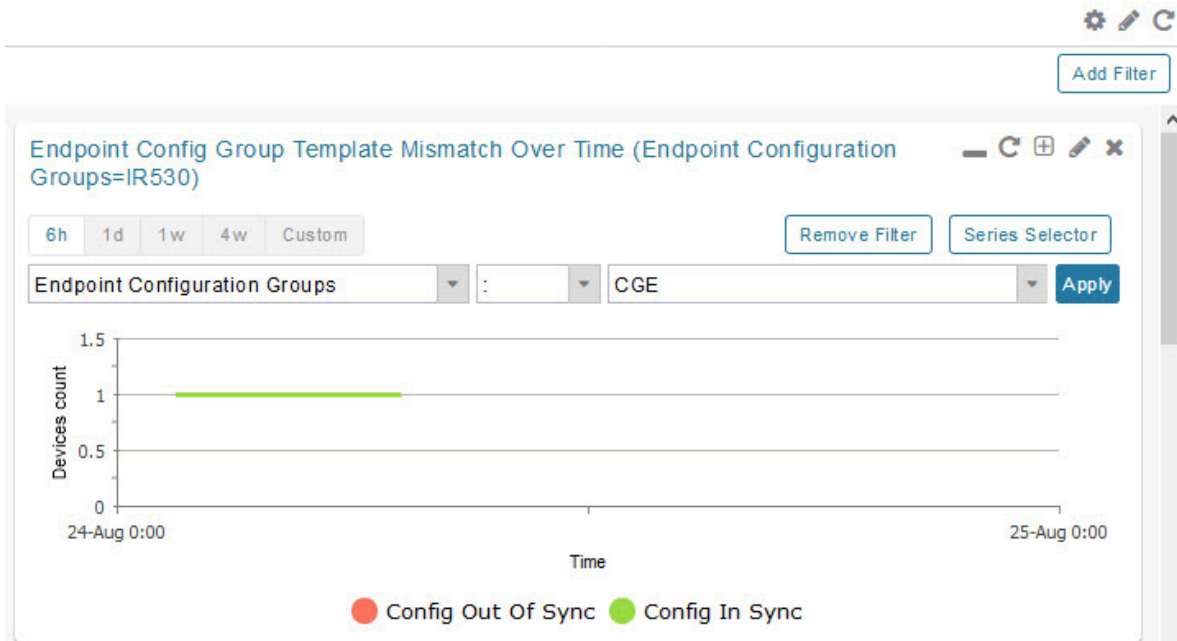
3. Click **Close**.

Using Filters

You use filters to refine the displayed line-graph data by groups. Applied filters display after the dashlet title.

To use the filters:

1. Click the interval icon (pencil) in the upper-right corner of the panel to display the 2 filtering parameters on the chart: a time frame (such as 6h) and components (such as Endpoint Configuration Groups, Mesh Endpoints (MEs)).
2. Click a time frame.



3. From the first drop-down menu, choose a group type.
4. From the third drop-down menu, choose a group.
5. Click **Apply**.

The pencil icon is green and the filter displays next to the dashlet name to indicate that a filter is applied.

Note: Click the **Remove Filter** button to remove the filter and close the filter options.

Exporting Dashlet Data

You can export dashlet data to a CSV file.

To export dashlet data:

1. On the desired dashlet, click the export button (+).
A browser download session begins.
2. Navigate to your default download directory to view the export file.

The filename begins with the word "export-" and includes the dashlet name (for example, export-Node_State_Over_Time_chart-1392746225010.csv).

Monitoring Events

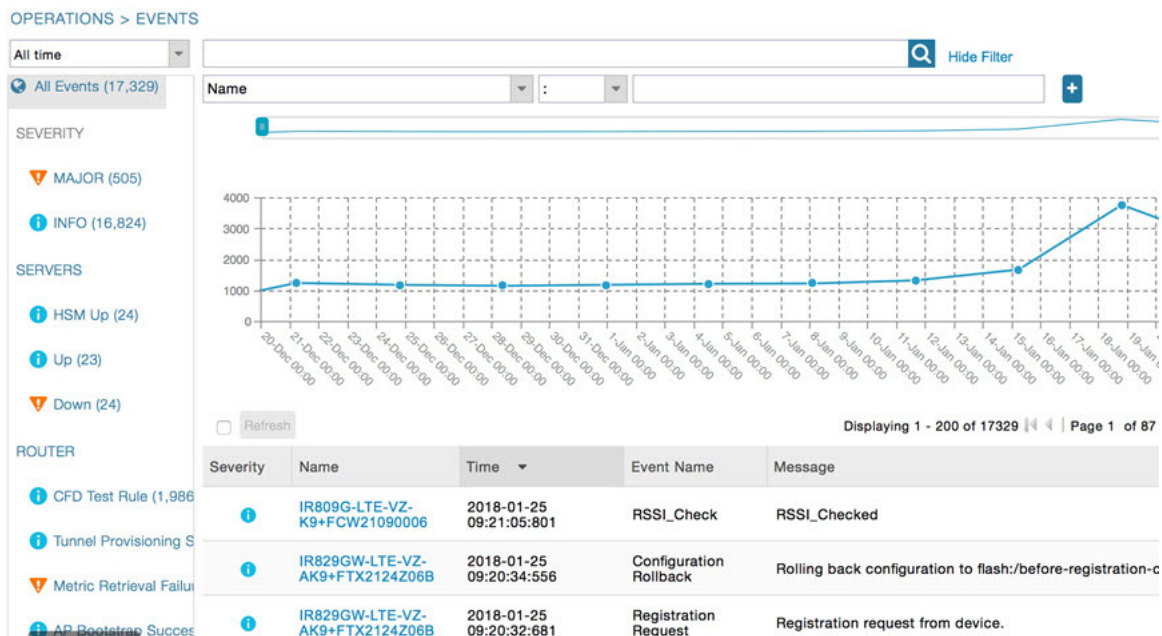
This section provides an overview of events and how to search and sort events, including the following topics:

- [Viewing Events](#)
- [Filtering by Severity Level](#)
- [Advanced Event Search](#)
- [Sorting Events](#)
- [Searching By Event Name](#)
- [Searching by Labels](#)

Viewing Events

As shown in [Figure 2](#), the Events page (**OPERATIONS > Events**) lists all events for those devices that IoT FND tracks. All events are stored in the IoT FND database server.

Figure 2 Operation > Events Page



By default, the **Operations > Events** page displays the Events chart, which is a visual view of events in a time line. However, depending on the number of devices the IoT FND server manages, this page can sometimes time out, especially when the system is fully loaded. In that case, open the Preferences window by choosing **username > Preferences** (top right), clearing the check boxes for showing chart and summary counts on the Events page, and clicking **Apply**.

- To limit the amount of event data displayed on this page, use the Filter drop-down menu (at the top of the left pane). For example, you can show the events for the last 24 hours relative to the last 30 days, or events for a specific day within the last seven days.
- To enable automatic refresh of event data to refresh every 14 seconds, check the check box next to the **Refresh** button. To immediately refresh event data click the **Refresh** button or the refresh icon.

Note: The amount of event data displayed on the Events page is limited by the data retention setting for events at **ADMIN > System Management > Data Retention**.

All Events Pane Filters

Use the preset filters in the All Events pane to only view those event types.

Device Events

In the left pane, IoT FND tracks events for the following devices:

- Routers
- Endpoints
- Head-end Devices
- CG Mesh Devices
- NMS Servers
- Database Servers


Event Severity Level

In the left pane, select an event severity level to filter the list view to devices with that severity level:

- Critical
- Major
- Minor
- Info

Each event type has a preset severity level. For example, a Router Down event is a Major severity level event.

Preset Events By Device

IoT FND has a preset list of events it reports for each device it tracks. A list of those events is summarized under each device in the left pane on the Events page. For example, in the left pane click the show/hide icon () next to Routers to expand the list of all events for routers.

Filtering by Severity Level

To filter by severity level, click the pencil icon:

1. Choose **OPERATIONS > Events**.
2. Click the **SEVERITY** show/hide arrow (left-pane).

Note: Only those severity levels (**CRITICAL, MAJOR, MINOR, OR INFO**) that have occurred display in the left pane under the SEVERITY heading.

3. Click a severity level to display all events of that severity level in the Events pane (right-pane).

Advanced Event Search

To use the filter to search for events:

1. Choose **OPERATIONS > Events**.
2. Under All Events (left pane), select an event category to narrow down your search.
3. Click the **Show Filter** link at the top of the main pane.
4. Use the filter drop-down menus and fields to specify your search criteria.
5. Click the plus button (+) to add the search strings to the Search field.

Repeat the process of adding search strings to the Search field as needed.

6. Click **Search Events** or press Enter.

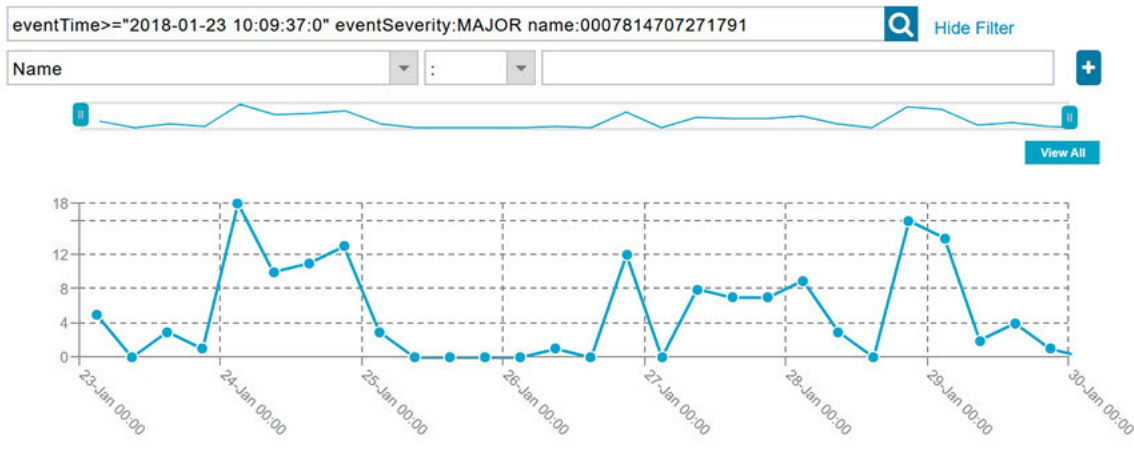
The search results display in the Events pane.

You can also add search strings manually, as shown in the following examples:

- To filter events by Name (EID), enter the following string in the Search Events field, as shown in [Figure 2](#):

name: *router eid string*.

Search Events by Name Filter



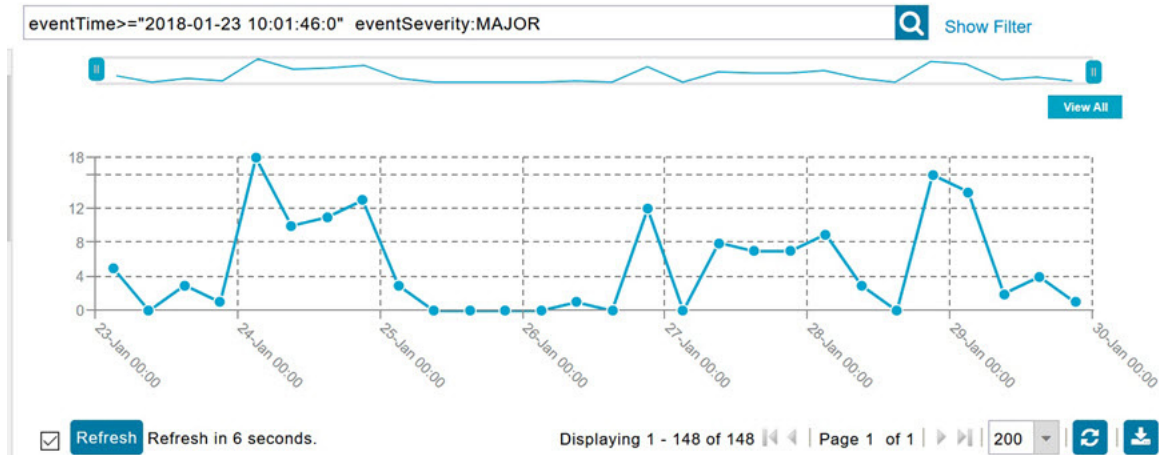
Note: Note the use of the asterisk (*) wild card with this filter.

- To filter by event time period, enter the following string in the Search Events field, as shown in graph below:

eventTimeoperator"YYYY-MM-DD HH:MM:SS:SSS"

Supported operators are: <, >, >=, <=, :

Note: Do not enter a space between **eventTime** and the operator.



Sorting Events

To sort events in ascending or descending order, roll over any column and select the appropriate option from the heading drop-down menu.

Searching By Event Name

To search by event name (for example, Battery Low):

1. Choose **OPERATIONS > Events**.
2. In the left pane, click the device type.
3. Click the **Show Filter** link at the top of the right pane to display the search fields.
4. Choose **Event Name** from the left drop-down menu.
5. Choose the event name from the options in the right drop-down menu.
6. Click the plus button (+) at the right to add the filter to the Search Events field.

The filter syntax appears in the Search Events field.

7. Click the **Search Events** button (magnifying glass icon).

The search results display in the Events pane.

Searching by Labels

Allows you to search and filter events based on Label names tagged to Field Devices.

1. Choose **OPERATIONS > Events**.
2. Click **All Events** in the left pane.

3. Click the **Show Filter** link at the top of the right pane.
4. Choose **Label** from the left drop-down menu.
5. Choose the event name from the options in the right drop-down menu or create your own.
6. Click the plus button (+) at the right to add the filter to the Search Events field.
The filter syntax appears in the Search Events field.
7. Click the **Search Events** button (magnifying glass icon).
The search results display in the Events pane.

Exporting Events

You can export events to a CSV file to examine as a log of event severity, time, name and event description by device.

To export events:

1. Choose **OPERATIONS > Events**.
2. Click the desired severity level or device type in the left pane.
3. Click the **Export** button (+).
A browser download session begins.
4. Navigate to your default download directory to access the CSV file.

Events Reported

[Table 1](#) lists the events reported by IoT FND 3.1.x (and later). Details include the event severity (Critical, Major, Minor, Information) and the devices that report those events.

Table 1 Events Reported

Event	Devices	Severity
CRITICAL EVENTS		
Certificate Expired	AP800, CGR1000, C800, FND, IR800	Critical
DB FRA Space Critically Low	Database	Critical
DB Table Space Critically Low	Database	Critical
Invalid CSMP Signature	CGMESH, IR500	Critical
Outage	Cellular, CGMESH, IR500	Critical
RPL Tree Size Critical	CGR1000	Critical
SD Card Removal Alarm	CGR1000	Critical
MAJOR EVENTS		
AAA Failure	C800, CGR1000, IR800	Major
ACT2L Failure	C800, CGR1000, IR800	Major
Archive Log Mode Disabled	Database	Major
Battery Failure	CGR1000	Major
Battery Low	CGR1000, IR500	Major
BBU Configuration Failed	IR500	Major

Table 1 Events Reported

Event	Devices	Severity
BBU Firmware Download Failed	IR500	Major
BBU Firmware Mismatch Found	CGR1000	Major
BBU Firmware Upgrade Failed	IR500	Major
BBU Lock Out	IR500	Major
BBU Power Off	IR500	Major
Block Mesh Device Operation Failed	CGR1000	Major
Certificate Expiration	AP800, C800, CGR1000, FND, IR800	Major
DB FRA Space Very Low	Database	Major
Default Route Lost	CGMESH, IR500	Major
Device Unknown	FND	Major
Door Open	C800, CGR1000, IR800, LORA	Major
Dot1X Authentication Failure	CGR1000	Major
Dot1X Authentication Flood	C800, CGR1000, IR800	Major
Down	AP800, ASR, C800, Cellular, CGMESH, CGR1000, Database, FND, IR500, IR800, ISR3900, LORA	Major
Element Configuration Failed	C800, CGR1000, IR800	Major
High CPU Usage	LORA	Major
High Flash Usage	LORA	Major
High Temperature	LORA	Major
HSM Down	FND	Major
Interface Down	ASR, ISR3900	Major
Linecard Failure	C800, CGR1000, IR800	Major
Line Power Failure	C800, CGR1000, IR800	Major
Link Down	IR500	Major
Low Flash Space	C800, CGR1000, IR800	Major
Low Memory/Memory Low	C800, CGR1000, FND, IR800, LORA (Memory Low)	Major
Low Temperature	LORA	Major
Mesh Connectivity Lost/ Node Connectivity Lost	CGMESH, IR500	Major
Mesh Link Key Timeout/ Node Link Key Timeout	CGMESH, IR500	Major
Metric Retrieval Failure	ASR, C800, CGR1000, IR800, ISR3900	Major
Modem Temperature Cold Alarm	C800, CGR1000, IR800	Major
Modem Temperature Warm Alarm	C800, CGR1000, IR800	Major
Node Connectivity Lost	CGMESH, IR500	Major
Node Link Key Timeout	CGMESH, IR500	Major
Packet Forwarder Usage High	LORA	Major
Port Down	AP800, C800, CGR1000, IR800	Major

Table 1 Events Reported

Event	Devices	Severity
Port Failure	AP800, C800, CGR1000, IR800	Major
Refresh Router Mesh Key Failure	CGR1000	Major
RPL Tree Size Warning	CGR1000	Major
Software Crash	C800, CGR1000, IR800	Major
SSM Down	FND	Major
System Software Inconsistent	C800, CGR1000, IR800	Major
Temperature Major Alarm	C800, CGR1000, IR800	Major
Time Mismatch	CGMESH, IR500	Major
Tunnel Down	C800, CGR1000, IR800	Major
Tunnel Provisioning Failure	C800, CGR1000, IR800	Major
Unknown WPAN Change	CGMESH, IR500	Major
MINOR EVENTS		
DB FRA Space Low	Database	Minor
Dot1X Re-authentication	CGMESH, IR500	Minor
Temperature Minor Alarm	C800, CGR1000, IR800	Minor
Temperature Low Minor Alarm	C800, CGR1000, IR800	Minor
RPL Tree Reset	CGR1000	Minor
INFORMATION EVENTS		
Archive Log Mode Enabled	Database	Information
Battery Normal	CGR1000	Information
Battery Power	CGR1000	Information
BBU Firmware Download Passed	CGR1000	Information
Certificate Expiration Recovery	AP800, C800, CGR1000, FND, IR800	Information
Cold Boot	AP800, C800, CGMESH, CGR1000, IR500, IR800	Information
Configuration is Pushed	FND	Information
Configuration Rollback	AP800, C800, CGR1000, IR800	Information
DB FRA Space Normal	Database	Information
DB Table Space Normal	Database	Information
Device Added	Cellular, C800, CGMESH, CGR1000, IR500, IR800	Information
Device Location Changed	C800, CGR1000, IR800	Information
Device Removed	Cellular, C800, CGMESH, CGR1000, IR500, IR800	Information
Door Close	C800, CGR1000, IR800, LORA	Information
Dot11 Deauthenticate Send	C800, CGR1000, IR800	Information
Dot11 Disassociate Send	C800, CGR1000, IR800	Information
Dot11 Authentication Failed	C800, CGR1000, IR800	Information
Hardware Insertion	C800, CGR1000, IR800	Information
Hardware Removal	C800, CGR1000, IR800	Information
High CPU Usage Recovery	LORA	Information
High Flash Usage Recovery	LORA	Information

Table 1 Events Reported

Event	Devices	Severity
High Temperature Recovery	LORA	Information
HSM Up	FND	Information
Interface Up	ASR, ISR3900	Information
Line Power	C800, CGR1000, IR800	Information
Line Power Restored	C800, CGR1000, IR800	Information
Link Up	IR500	Information
Low Flash Space OK	C800, CGR1000, IR800	Information
Low Memory OK/Low Memory Recovery	C800, CGR1000, IR800, LORA (Low Memory Recovery)	Information
Manual Close	ASR, Cellular, C800, CGMESH, CGR1000, IR500, IR800, ISR3900	Information
Major RPL Tree Size Warning OK	CGR1000	Information
Manual NMS Address Change	CGMESH, IR500	Information
Manual Re-Registration	CGMESH, IR500	Information
Mesh Certificate Change/ Node Certificate Change	CGMESH, IR500	Information
Mesh Module Firmware Upgrade has been successful	CGR1000	Information
Migrated To Better PAN	CGMESH, IR500	Information
Modem Status Changed	LORA	Information
Modem Temperature Cold Alarm Recovery	C800, CGR1000, IR800	Information
Modem Temperature Warm Alarm Recovery	C800, CGR1000, IR800	Information
NMS Address Change	CGMESH, IR500	Information
NMS Returned Error	CGMESH, IR500	Information
Node Certificate Change	CGMESH, IR500	Information
Packet Forwarded High Usage Recovery	LORA	Information
Packet Forwarder Status	LORA	Information
Packet Forwarded High Usage Recovery	LORA	Information
Port Up	AP800, C800, CGR1000, IR800	Information
Power Source OK	C800, CGR1000, IR800	Information
Power Source Warning	C800, CGR1000, IR800	Information
Registered	ASR, ISR3900	Information
Registration Failure	AP800, Cellular, C800, CGR1000, IR800, LORA	Information
Registration Request	AP800, C800, CGR1000, IR800, LORA	Information
Registration Success	AP800, Cellular, C800, CGR1000, IR800, LORA	Information
Rejoined With New IP Address	CGMESH, IR500	Information
Restoration	Cellular, CGMESH, IR500	Information

Table 1 Events Reported

Event	Devices	Severity
Restoration Registration	CGMESH, IR500	Information
RPL Tree Size Critical OK	CGR1000	Information
Rule Event	ASR, C800, CGMESH, CGR1000, Database, FND, IR500, IR800, ISR3900	Information
SSM Up	FND	Information
Temperature Low Recovery	LORA	Information
Temperature Low Minor Alarm Recovery	C800, CGR1000, IR800	Information
Temperature Major Recovery	C800, CGR1000, IR800	Information
Temperature Low Major Alarm Recovery	C800, CGR1000, IR800	Information
Temperature Minor Recovery	C800, CGR1000, IR800	Information
Time Mismatch Resolved	CGMESH, IR500	Information
Tunnel Provisioning Request	C800, CGR1000, IR800	Information
Tunnel Provisioning Success	C800, CGR1000, IR800	Information
Tunnel Up	C800, CGR1000, IR800	Information
Unknown Event	AP800, ASR, C800, Cellular, CGMESH, CGR1000, Database, FND, IR500, IR800, ISR3900, LORA	Information
Unknown Registration Reason	CGMESH, IR500	Information
Unsupported	AP800, C800, CGR1000, IR800, LORA	Information
Up	AP800, ASR, C800, Cellular, CGMESH, CGR1000, Database, FND, IR500, IR800, ISR3900, LORA,	Information
Warm Start	IR500	Information
WPAN Watchdog Reload	CGR1000	Information

Monitoring Issues

This section provides an overview of issues and how to search for and close issues in IoT FND, including the following topics:

- [Viewing Issues](#)
- [Viewing Device Severity Status on the Issues Status Bar](#)
- [Adding Notes to Issues](#)
- [Searching Issues Using Predefined Filters](#)
- [Search Issues Using Custom Filters](#)
- [Closing an Issue](#)

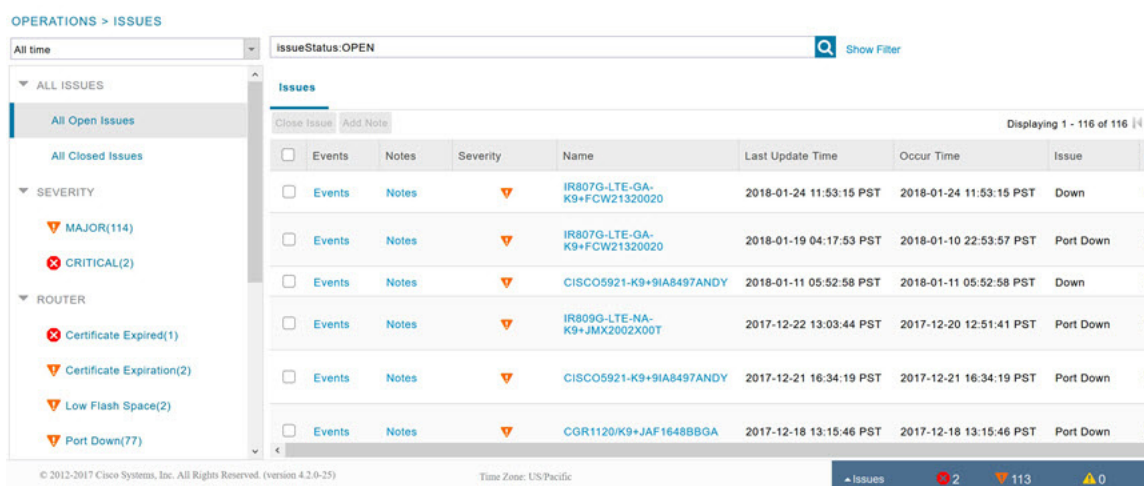
Viewing Issues

IoT FND offers different ways to monitor issues:

- The **OPERATIONS > Issues** page ([Figure 3](#)) provides a snapshot of the health of the network by highlighting only major and critical events that are active within the network.

- The Issues Status bar (Figure 4) displays in the footer of the browser window and shows a count of all issues by severity for selected devices.

Figure 3 OPERATIONS > Issues Page



The Issues page provides an abbreviated subset of unresolved network events for quick review and resolution by the administrator. Issues remain open until either the associated event is resolved (and IoT FND generates a resolution event) or the administrator manually closes the event.

Only one issue is recorded when multiple entries for the same event are reported. Each issue has a counter associated with it. As an associated event is closed, the counter decrements by one. Every open or closed issue has an associated event.

Note: The amount of closed issues data that displays on the Issues page is limited by the **Keep Closed Issues for** data retention setting (**ADMIN > System Management > Data Retention**), which is based on the time the issue was closed. When the issue was closed displays as the Last Update Time for the issue.

Viewing Device Severity Status on the Issues Status Bar

A tally of issues listed by severity for the selected devices displays in the Issues status bar in the bottom-right of the browser window frame (Figure 4). You can set the device types for issues that display in the Issues status bar in User Preferences.

Figure 4 Issues Status Bar



Click the Issues status bar to view the Issues Summary pane (Figure 5), which displays issues listed by the selected device category. Click count links in the Issues Summary pane to view complete issue criteria filtered by severity on the **OPERATIONS > Issues** page.

Figure 5 Issues Summary Pane

Device Category	Critical	Major	Minor
router	0	6526	4285
her	0	0	0
server	0	0	0
endpoint	0	24453	0

Issues: 0 Critical, 30979 Major, 4285 Minor

Adding Notes to Issues

On the **OPERATIONS > Issues** page, you can add notes about Issues for a device.

Click the Notes link inline to access any notes entered for the Issue or add a note on the Notes for Issues Name page.

You can edit and delete notes from issues on this page. Issues can have multiple notes. Notes on the Issues Name page display the time the note was created, the name of the user who wrote the note, and the text of the note. You can also add a note when closing an Issue. Notes are purged from the database with the issue.

OPERATIONS > ISSUES

All time | issueStatus:OPEN

ALL ISSUES

- All Open Issues
- All Closed Issues

SEVERITY

- MAJOR(114)
- CRITICAL(2)

Issues

Close Issue Add Note

	Events	Notes	Severity	Name	Last Update Time
<input checked="" type="checkbox"/>	Events	Notes	MAJOR	IR807G-LTE-GA-K9+FCW21320020	2018-01-24 11:53:15 PST
<input type="checkbox"/>	Events	Notes	MAJOR	IR807G-LTE-GA-K9+FCW21320020	2018-01-19 04:17:53 PST
<input type="checkbox"/>	Events	Notes	MAJOR	CISCO5921-K9+9IA8497ANDY	2018-01-11 05:52:58 PST

Note: In some cases, existing notes may exist for the system and the Notes for Issues Name pane displays.

To add a note to an Issue:

1. Click the **Notes** link inline or check the check box of the device and click **Add Note**.

The Notes for Issues Name pane displays.

2. Click **Add Note**.

The Add Note dialog displays.


3. Insert your cursor in the **Note** field and type your note.

4. Click **Add** when finished.

To edit an existing note in an issue:

1. Click the **Notes** link inline with the issue.

The Notes for Issues Name pane displays.

2. Click the pencil icon () at the right of the note that you want to edit.
3. Edit the note, and click **Done** when finished.

To delete a note from an issue:

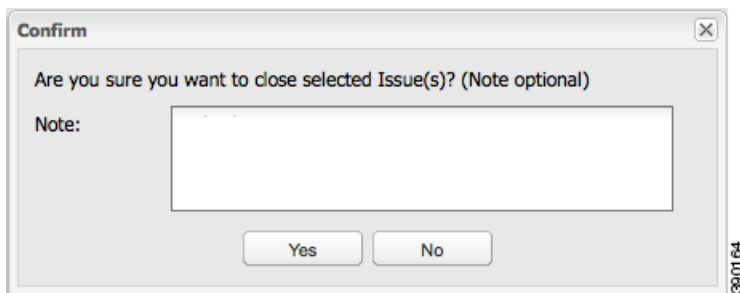
1. Click the **Notes** link inline with the issue.

The Notes for Issues Name pane displays.

2. Click the red (X) icon at the right of the note.
3. Click **Yes** to confirm the deletion.

To add a note when closing an issue:

1. At the **Operations > Issues** page, check the box next to the issue you are closing.
2. Click **Close Issue** button that appears above the event listings.
3. In the Confirm dialog box, insert your cursor in the Note field and type the note text.



4. To confirm that you want to close the issue and save the note, click **Yes**.

Searching Issues Using Predefined Filters

To search for open issues for a specific system or severity level:

1. Choose **OPERATIONS > Issues**.

To list only open issues, click **All Open Issues** (left pane).

Note: By default, IoT FND displays all issues that occurred within the specified data retention period (see [Configuring Data Retention](#)):

- To see Closed Issues associated with an event type or severity level, change **issueStatus:OPEN** to **issueStatus:CLOSED** in the Search Issues field, and then click **Search Issues**.
- To list all closed issues, in the left pane, click **All Closed Issues**.

2. Click a device category, event type, or severity level to filter the list.

The filter syntax appears in the Search Issues field, and the search results display in the main pane.

Search Issues Using Custom Filters

To search by creating custom filters:

1. Choose **OPERATIONS > Issues**.
2. Click **Show Filter**.
3. From the Filter drop-down menus, choose the appropriate options.

For example, to filter Severity levels by Name (EID):

- In the left pane, select a Severity level (such as Major). The filter name populates the first field (top) of the Filter.
- From the second Filter drop-down menu on the left, choose **Name**.
- In the third Filter field, enter the EID of the device to discover issues about.
- Click the search icon (magnifying glass) to begin the search.

You can also enter the search string in the Search Issues field. For example:

```
issueSeverity:MAJOR issueStatus:OPEN name:IR807G-LTE-GA-K9+FCW21320020
```

4. Click **Search Issues**.


The issues, if any, display in the Search Issues section (right pane).

The screenshot shows the 'OPERATIONS > ISSUES' interface. At the top, there is a search bar with the filter string 'issueSeverity:MAJOR issueStatus:OPEN name:IR807G-LTE-GA-K9+FCW21320020'. Below the search bar, there are filter dropdown menus for 'Issue Severity' and 'Name'. The main area displays a table of issues with columns for 'Events', 'Notes', 'Severity', 'Name', 'Last Update Time', 'Occur Time', 'Issue', and 'Issue Status'. Two issues are listed, both with a severity of 'MAJOR' and status 'OPEN'.

Events	Notes	Severity	Name	Last Update Time	Occur Time	Issue	Issue Status
Events	Notes	MAJOR	IR807G-LTE-GA-K9+FCW21320020	2018-01-24 11:53:15 PST	2018-01-24 11:53:15 PST	Down	OPEN
Events	Notes	MAJOR	IR807G-LTE-GA-K9+FCW21320020	2018-01-19 04:17:53 PST	2018-01-10 22:53:57 PST	Port Down	OPEN

5. Click the **Events** link to display events associated with an issue.

The Events for Issue Name pane displays all events for that device.

issueSeverity:MAJOR issueStatus:OPEN  Show Filter

Events for Issue Name: Port Down EID: IR807G-LTE-GA-K9+FCW21320020 on: 2018-01-19 04:17:53 PST

Last Update Time: 2018-01-19 04:17:53 PST **Occur Time:** 2018-01-10 22:53:57 PST
Name: Port Down **EID:** IR807G-LTE-GA-K9+FCW21320020 **Status:** OPEN **Severity:** MAJOR
Message: Interface is down. Check event list for more details.

Time	Event Name	EID	Severity	Message
2018-01-10 22:53:57:188	Port Down	IR807G-LTE-GA-K9+FCW21320020		Tunnel123 interface is down.

6. Click **Search Issues** or any link in the left pane to return to the Issues pane.

Closing an Issue

In most cases, when an event is resolved, the issue is closed automatically by the software. However, when the administrator has actively worked on resolving the issue, it might make sense to close the issue directly. When the issue is closed, IoT FND generates an event.

To close a resolved issue:

1. Choose **OPERATIONS > Issues**.
2. Locate the issue by following the steps in either the [Searching Issues Using Predefined Filters](#) or [Search Issues Using Custom Filters](#) section.
3. In the Search Issues section (right pane), check the check boxes of the issues to close.
4. Click **Close Issue**.

Note: You can also add a note to the issue at this time.

5. Click **Yes**.

Viewing Device Charts

- [Router Charts](#)
- [Mesh Endpoint Charts](#)

Router Charts

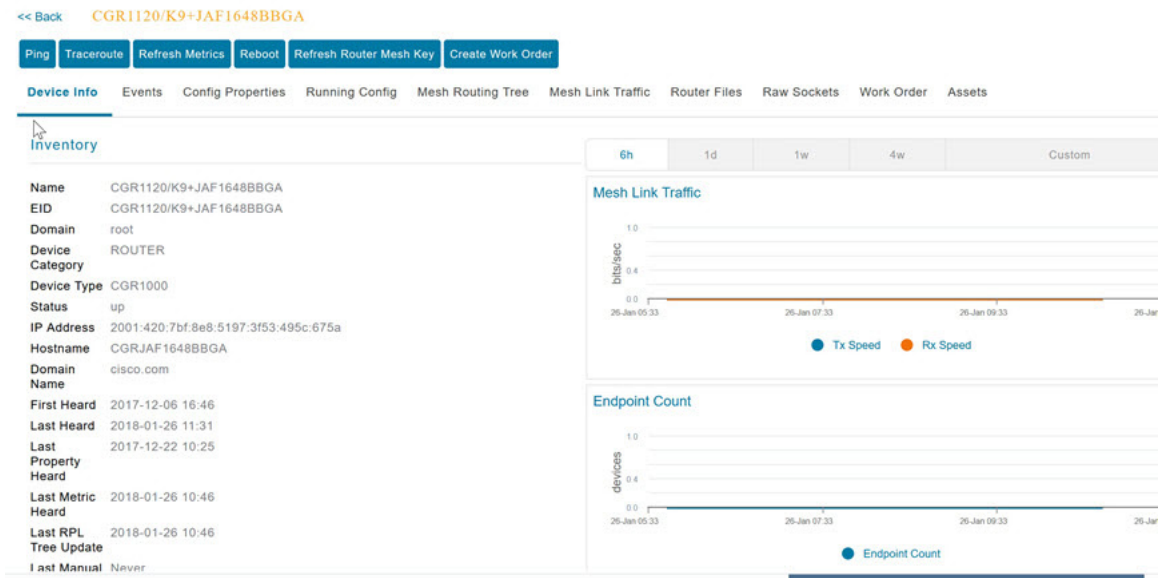
IoT FND provides these charts in the Device Info pane on the Device Details page for any router:

Table 2 Device Detail Charts

Chart	Description
Link Traffic	Shows the aggregated WPAN rate for a router over time.
Mesh Endpoint Count	Shows the number of MEs over time.
Cellular Link Metrics	Shows the metrics (transmit and receive speed), RSSI, Bandwidth Usage (current Billing Cycle) for all logical cellular GSM and CDMA interfaces.
Cellular Link Settings	Shows properties for cellular physical interfaces with dual and single modems.
Cellular Link Traffic	Shows the aggregated WPAN rate per protocol over time.
Cellular RSSI	Cellular RSSI.
WiMAX Link Traffic	Shows the receiving and sending rates of the WiMAX link traffic for the router over time.
WiMAX RSSI	Shows the receiving and sending rates of the WiMAX RSSI traffic for the router over time.
WPAN Traffic	(Master only) Shows Dual PHY WPAN traffic trends.
Ethernet Link Traffic	Shows the receiving and sending rates of the Ethernet traffic for the router over time.
Cellular Bandwidth Usage Over Time	Shows the bandwidth usage over time for the cellular interface.
Ethernet Bandwidth Usage Over Time	Shows the bandwidth usage over time for the Ethernet interface.

Figure 6 shows the Router Device Info page.

Figure 6 Router Device Page



Mesh Endpoint Charts

IoT FND provides the charts listed in [Table 3](#) in the Device Info pane on the Device Details page for any mesh endpoint.

Table 3 Device Detail Charts

Chart	Description
Link Traffic	Shows the aggregated WPAN rate for a router over time.
Path Cost and Hops	Shows the RPL path cost value between the element and the root of the routing tree over time (see Configuring RPL Tree Polling).
Link Cost	Shows the RPL cost value for the link between the element and its uplink neighbor over time.
RSSI	Shows the measured RSSI value of the primary mesh RF uplink (dBm) over time.

Figure 7 Mesh Endpoint Device Info Page (partial view)

