MDS PulseNET
Network Management System

GE PulseNET Standard

User Guide

Version 4.5.0

E2E TECHNOLOGIES

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Introduction

This guide provides an overview of GE PulseNET operations—describing its purpose, explaining key concepts, and providing instructions for basic operations.

What is GE PulseNET?

GE PulseNET is a software application used for monitoring devices in Industrial Communications networks. Each device that GE PulseNET monitors serves a specific function in the network. These functions may include acting as a bridge, router, access point/base station, or remote/subscriber. The devices can be widely dispersed geographically and are able to operate with different bandwidths, depending on radio type and frequency. For additional information on specific Industrial Communications products, refer to the GE MDS website.

GE PulseNET Standard edition is intended for small-scale operations with a need to monitor up to 500 devices. GE PulseNET Enterprise edition is intended for large-scale operations with a need to monitor 25,000+ devices.

How Does GE PulseNET Work?

For GE PulseNET to be used to monitor devices, an administrator must first perform a few steps. The Administration Guide gives information on how to perform these tasks.

1. Acquire a license for the number of devices to be monitored
2. Perform discovery on the network to locate the supported devices to be monitored
3. Authorize the devices to be monitored

Authorizing a device will permanently link that device's serial number to a GE PulseNET license. The maximum number of devices you can authorize is limited by the monitoring capacity of your GE license. See "Working with Licenses" in the Administration Guide.

After your devices are authorized for monitoring, GE PulseNET begins polling those devices for configuration, availability, and performance information.

As GE PulseNET monitors the devices, alerts may be raised if any of the devices are having problems. The thresholds that trigger those alerts are set by configuring GE PulseNET rules. Alerts may also be generated if your license is approaching its expiration date or if the GE PulseNET host server is filling its available disk space, for example. For more information, see "Rules and Notifications" in the Administration Guide.

Understanding GE PulseNET Roles

There are two basic GE PulseNET roles.

Operators are responsible for tracking the status of the devices that the system is monitoring. Operators have access to a restricted set of dashboards. The User Guide explains the tasks that operators can accomplish.

Administrators control the overall functionality of the system and provide support for operators. Administrators have a number of responsibilities including creating users, requesting and installing licenses, requesting GE support, and managing system settings, schedules, and the sample frequency of data collection. The Administration Guide explains the specialized tasks that administrators can accomplish.

GE PulseNET Documentation

Release Notes

The Release Notes provide:

- A list of new and updated features
- Workarounds for any known issues
- Late-breaking news about the software

Consult this document first, because it may contain updates to information and procedures described in the other GE PulseNET documents.

Installation Guide

The Installation Guide includes:

- Installation prerequisites, system recommendations, and planning guidelines
- Instructions for installing and configuring GE PulseNET on all supported platforms

User Guide

The User Guide provides basic navigation and operation information that all users, especially those with the operator role, will need in order to effectively use GE PulseNET.

- An overview of GE PulseNET, describing its purpose, explaining key concepts, and providing instructions for basic navigation
- Basic navigation and dashboard overview
- Working with time ranges, charts, and tables
- Managing and monitoring devices, including device detail views
- Creating and scheduling reports and dealing with alerts

Administration Guide

The Administration Guide is intended to help those with the administrator role configure and manage the GE PulseNET system. This guide provides instructions on how to perform administrative tasks such as:

- Creating and managing users
- Requesting and installing licenses
- Configuring email settings and user access methods
- Creating report schedules and setting rule thresholds
- Setting the polling frequency for data collection
- Discovering and authorizing devices for monitoring
- Requesting GE support

Getting Started

This chapter provides instructions for logging in to GE PulseNET, describes the first dashboard you see, and introduces you to navigating the GE PulseNET browser interface.

Perform these steps before following the instructions in this chapter:

- Obtain your GE PulseNET username and password from your administrator
- Ensure that your Web browser has JavaScript functionality enabled

Logging in to GE PulseNET

Before you can log in, the GE PulseNET services must be running.

To log in to GE PulseNET using a Web browser:

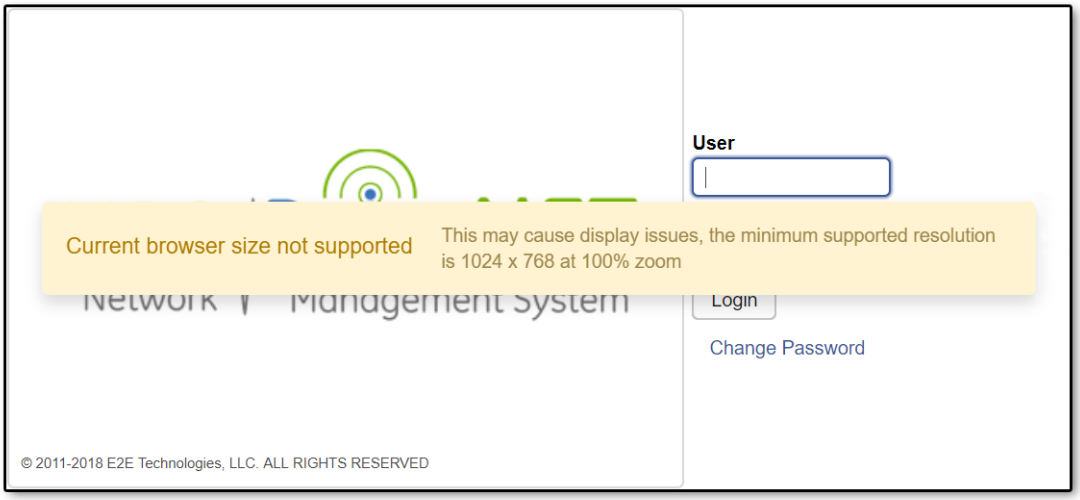
1. Open a Web browser (for a list of supported browsers, see the Installation Guide).
2. Navigate to the URL with the following syntax: `http[s]://<hostname>:<port>/` where *<hostname>* is the name of the machine that has a running instance of GE PulseNET and *<port>* is the HTTP or HTTPS port specified during installation (the defaults are 8080 and 8443).
3. On the login screen that appears, enter your **User name** and **Password**.
4. Click **Login**.

If you are an Operator, you are automatically taken to the Summary dashboard.

The appearance of GE PulseNET and the variety of dashboards you can access will vary depending on your role and the permissions you are assigned. Administrators can access advanced dashboards and configuration workflows, while Operators have access to a restricted set of dashboards, based on the permissions they have been granted.

Screen Resolution:

The minimum supported resolution for PulseNET is 1024 x 768. Any resolution lower than this will cause the page to not display correctly. If you get this message while on a higher resolution please increase the size of your browser.



Navigating GE PulseNET

This section describes basic GE PulseNET navigation. GE PulseNET is designed to display dynamic data that is updated regularly. For this reason, we recommend that you avoid using your browser's navigation buttons, because this may display cached views or result in an error message. Use the links in the Navigation Panel and main display or the breadcrumb trail instead.**Using the Navigation Panel**
Use the **Navigation Panel** at the upper left edge of the display to move between dashboards. This panel lists the dashboards that are available to you based on your role. The icon ≡ will hide the navigation panel when it is not needed. Click on a dashboard (such as **Documentation**) to bring it up in the display area.

In this software release, GE PulseNET does not remember the state of the panel between logins, so if you hide the panel when you log out, it will reappear the next time you log in. Session persistence is a feature planned for a future GE PulseNET release.

Using the Breadcrumb Trail

The name of the current dashboard is displayed in bold at the top of the dashboard, at the end of a path called the breadcrumb trail. When you move directly from one dashboard to another, the names of the previous dashboards are displayed in order.

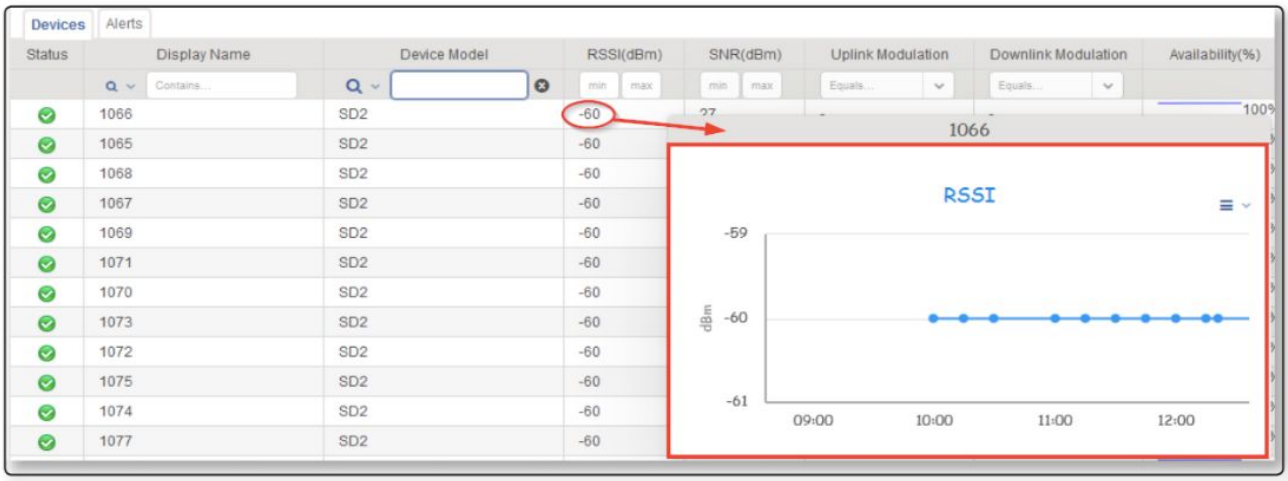
Use the links in the breadcrumb trail to return to previously viewed dashboards in a workflow

or series of drilldowns, rather than using the browser's back button.

Using Drilldowns and Popups

Use the graphic and text links in views to drill down to additional details that can help you diagnose problems. Depending on the link, you can either drill down to a different dashboard or to a smaller view called a popup that hovers above the dashboard you are currently viewing.

You can drill down from many different parts of a view, including the names of monitored components, the links in a popup, and items like charts, tables, and icons.



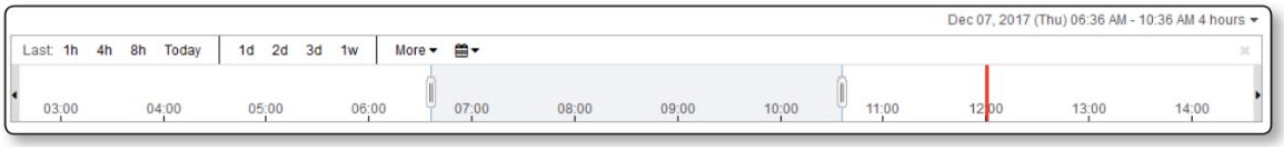
The example above shows a popup graph when hovering over the RSSI metric for a device. Clicking on the **RSSI metric** will cause the popup to become a separate window that remains on the display even when the cursor is moved away from that metric.

Selecting the Time Range

GE PulseNET controls the time range displayed using a special scrollbar-like control that is sometimes called a "zonar". The time range is available on most dashboards and views.

Time Range

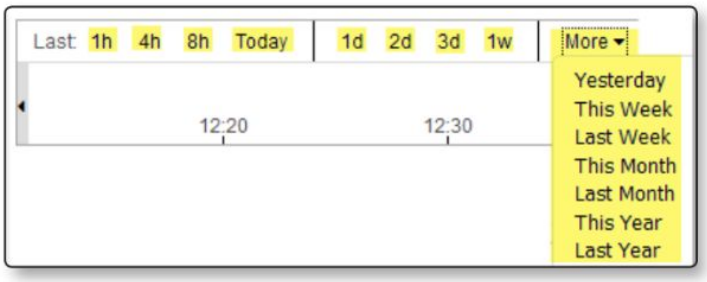
The time range in the upper right corner of a dashboard indicates the current time period for all the views on the page. The default setting is the last 4 hours. Changing the time range in a dashboard typically affects the range of data points that are displayed on the dashboard. Click the time range to access the Timeline and Calendar options, which allow you to specify a new time range.



Timeline View

With the Timeline view open, the red vertical line indicates the current time on the timeline. If for some reason the red line is not current, close the timeline view and reopen it to sync the red line with the current time.

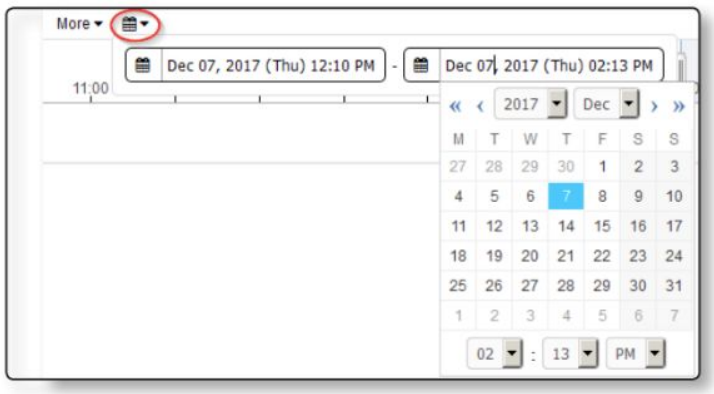
Click inside the adjustable scrollbar (dark gray area) to drag it to the left or the right. The start and end times of the range will change, but the total interval it spans stays the same. You can also increase or decrease the size of the time interval in the scrollbar by clicking and dragging the controls on each side of the scrollbar. As you adjust the scrollbar a popup displays the new time range.



You can also change the time range by clicking on any of the preset intervals highlighted in yellow. Selecting a preset interval will automatically adjust the timeline as well as the scrollbar time range.

Calendar View

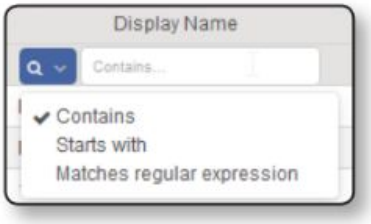
You may select your time range from a calendar by clicking the calendar icon and specifying the date and time that you desire as beginning and ending points. The timeline and scrollbar will automatically adjust to include the selected points in time.



Working with Tables

You can sort, filter, and search the data in a table if these functions are enabled on the table. If a table is sortable, you can change how its data is sorted by clicking any column heading. A down arrow icon indicates descending order, while an up arrow icon indicates ascending order.

Filtering Results by Values in a Column



Search fields are provided for each column at the top of every tabular display. You can use these fields to search for any value, and the tabular display will be filtered to show only those rows that match the value you entered. See the Appendix for a list of valid regular expressions.

Working with Columns

You can enable and disable columns that will be displayed in the table. Click the ≡ ⌄ Customizer icon at the upper right corner of the table and select Show Columns.

Select the columns you want to add or remove from the popup list of all the available columns.

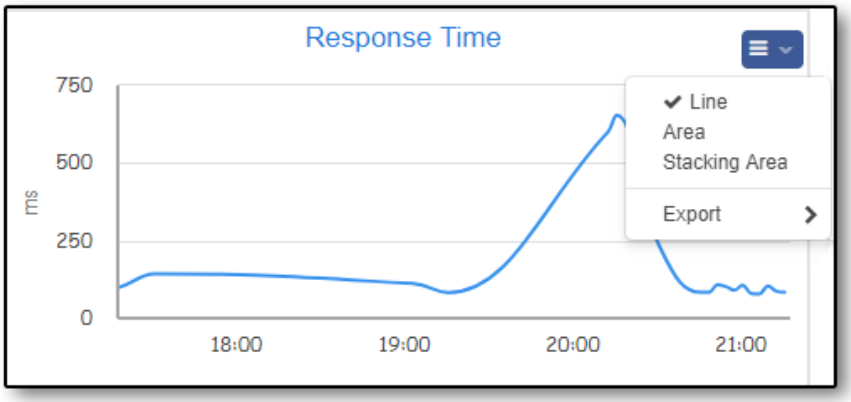
Working with Graphs

You can change a graph from one type to another to view the displayed information in a different format, and you can zoom into data points for a more granular view.

Changing the Graph Type

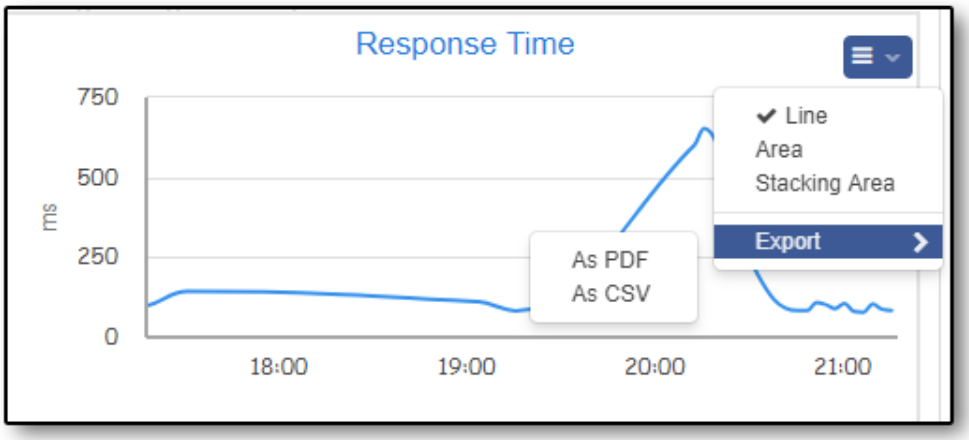
To change the graph type:

1. At the top right of the graph, click the ≡ ⌄ Customizer icon.
2. In the popup that appears, select a different graph type. The graph automatically changes to display the selected graph type.



To export the graph:

1. At the top right of the graph, click the ≡ ⌄ Customizer icon.
2. In the popup that appears, select **Export**. Choose the file type to export, PDF or CSV.



Using the Zoom Controls

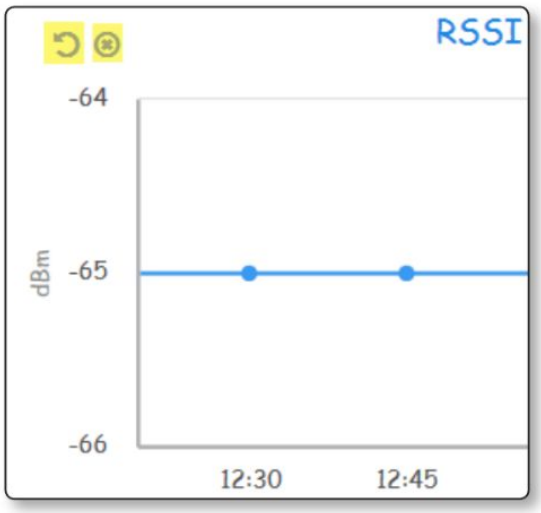
To zoom to a particular area of a graph:

1. Position the mouse cursor inside the X/Y axis of the graph. Click and drag the shaded area across the graph to the end of the area you want enlarged.
2. The graph will be redrawn displaying only the data points in the area you selected.

You can zoom into graph data multiple times if you desire.

To return to the previous zoom level:

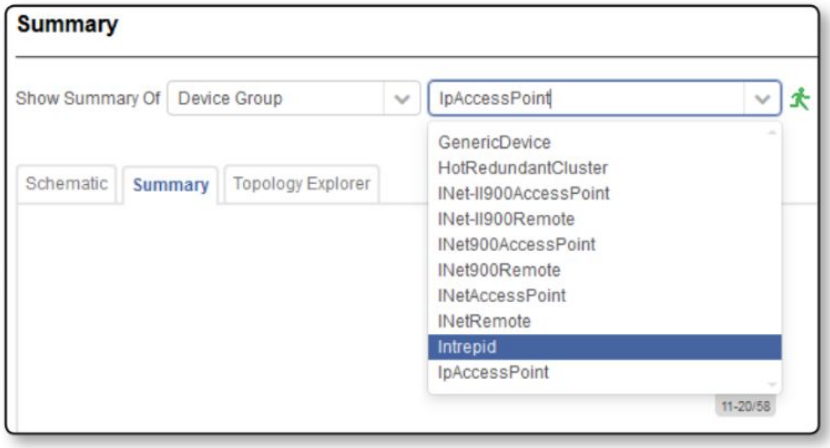
1. If you have zoomed in on a graph several times, you can return to the previous zoom level by clicking the Previous Zoom icon at the top left of the graph.
2. The graph returns to the previous setting. This option is only available after zooming at least once.



To restore a graph after zooming:

1. At the top left of the graph, click the Reset Zoom icon.
2. The graph returns to its original settings. This option is only available after zooming at least once.

Selecting the Device Group



Devices shown in the Summary dashboard can be selected either using a Device Group or a Device Filter. For more information about defining device groups or filters, see the **GE PulseNET Administration Guide**.

The number of device groups or filters is shown in the lower right corner of the dropdown menu, and once a device group has been chosen you can see which devices are part of that group by clicking the green running man icon at the right of the selection field.

When a device group or filter has been chosen, the Summary dashboard will include only the devices which match the selected filter.

Working with GE PulseNET

The GE PulseNET monitoring dashboards display data collected from your monitored environment and allow you to view this data in various formats and levels of detail. This chapter describes the GE PulseNET monitoring dashboards and workflows.

Summary Dashboard

As an operator, the first dashboard you see when you log in to the system is the Summary dashboard. The Summary dashboard automatically refreshes every three minutes.

The Summary dashboard has three tabs: the Schematic Tab, the Summary Tab, and the Topology Explorer Tab.

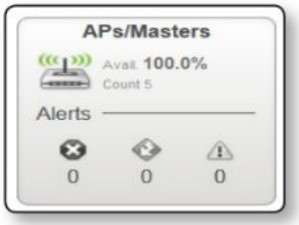
Schematic Tab

The Schematic tab displays a block diagram of the industrial communications infrastructure. It presents a snapshot of the state of all the devices in the network, and the square tiles represent the position that specific devices hold in the communication path.

The network devices are typically connected to various applications that receive and process data, and this is represented by the Applications on the left side of the Schematic tab.

GE PulseNET can identify device roles that include collection points, remote or subscriber devices, access points or base stations, backhaul devices, and other LAN devices. Snapshots for specific device types are only displayed if your network includes devices of those types.

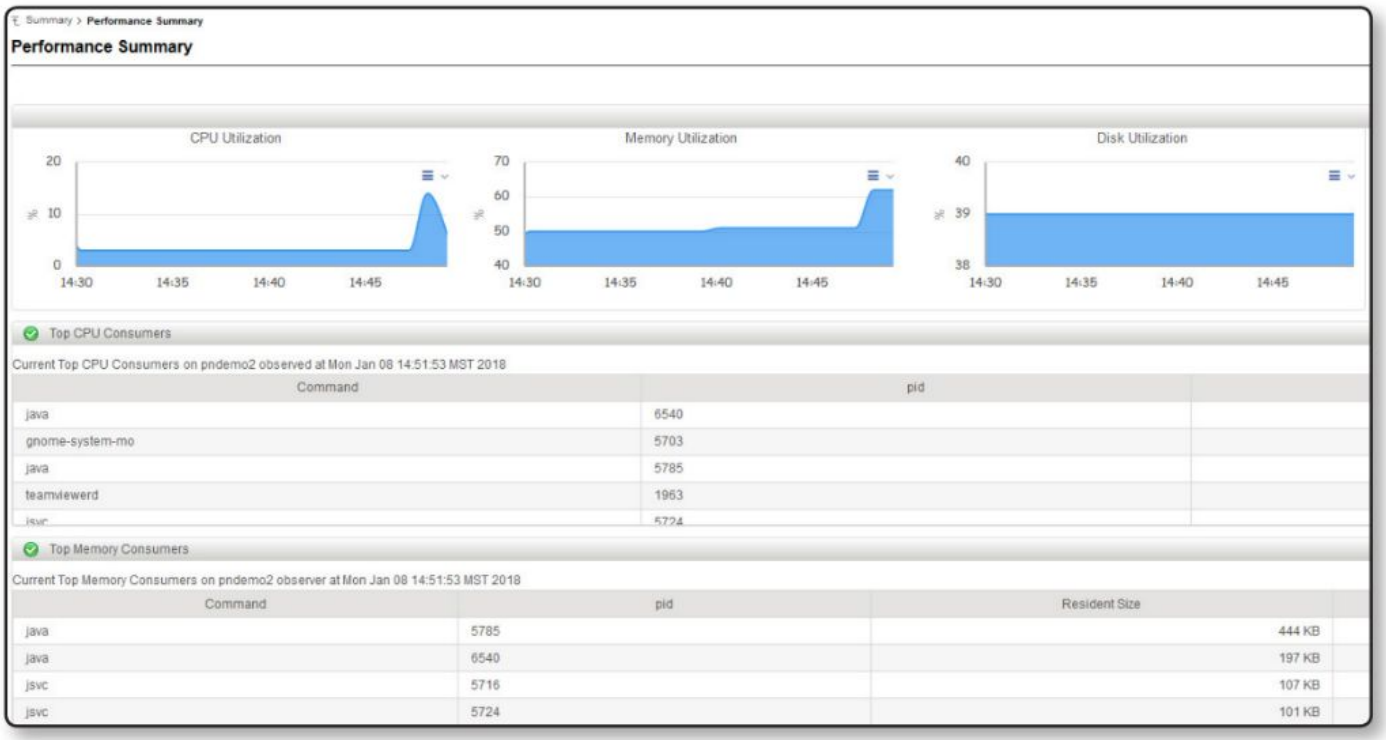
The snapshot views on the Schematic tab provide information about the state of all of the devices of a particular type. The percentage value on each snapshot indicates the average availability of all monitored devices of that type during the currently configured time range.



In the center of each snapshot, under the heading, is a count that indicates the number of devices of that type. Clicking the label or the Device icon on the left side of the snapshot will open the Summary tab and display information about all devices of that type.

Toward the bottom of each snapshot, there are three Alert fatal, critical, and warning. Below each is the number of alerts of that severity that exists in the device group. Clicking an Alert icon or number will open the Summary tab and display information about the type of alert you want to investigate.

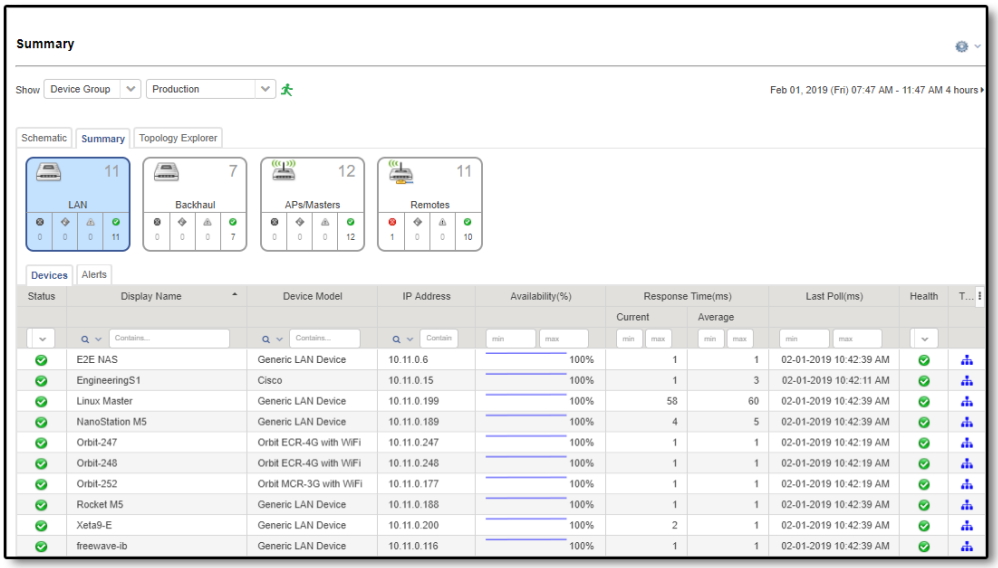
In addition, there is a GE PulseNET Host tile in the lower left corner of the Schematic display. This tile shows a performance snapshot of the GE PulseNET machine itself. Click the label or icon to drill into the machine Performance Summary dashboard.



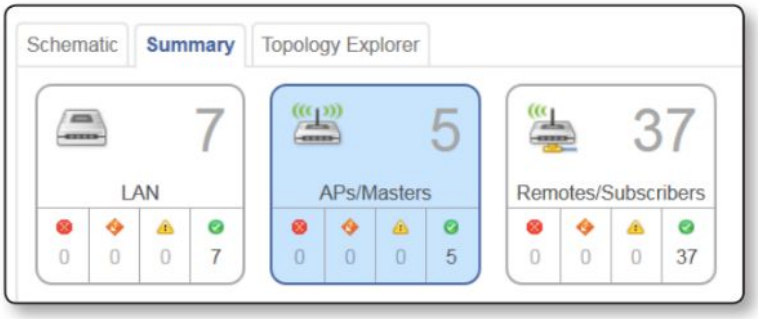
The Performance Summary dashboard displays a historical view of the system resources being used on the GE PulseNET server. This can be especially useful for troubleshooting issues with application, operating system, or hardware performance.

Summary Tab

Click the **Summary** tab to open this view. The Summary display has two sections: the Device Type Health View at the top and the Summary Table at the bottom. You also can click the Device Type icon on the left or the title of the snapshot to navigate to the Summary tab from any of the device snapshots on the Schematic tab of the Summary dashboard.



Device Type Health View



The Device Type Health view is located toward the top of the Summary tab. This view provides a tile for each kind of device in the communication path. Certain tiles are only displayed if those types of devices exist in the network.

Each tile summarizes the health information for the corresponding device type. Click the device icon at the upper left of a tile or the total number of devices at the upper right of a tile to view a list of all the corresponding devices in the selected device group. For example, click the AP/Masters icon to see information on each of the access point or master radios. The list is displayed in the Summary Table in the bottom half of the tab.

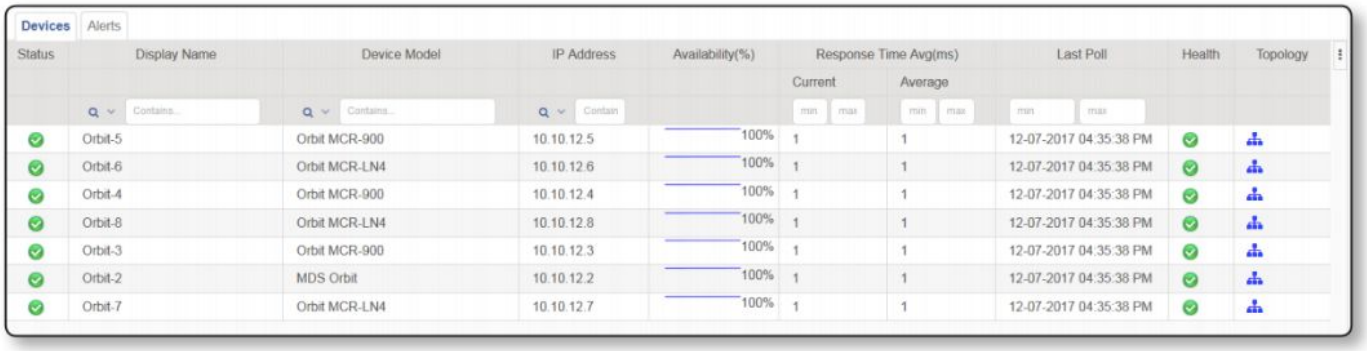
Toward the bottom of each tile, there are four Device Health fatal, critical, warning, and normal. Below each icon is the number of devices in that health state for the corresponding device type. Click a Device Health icon to view a list of the devices with that health state in the Summary Table. For example, click the warning icon under Remotes/Subscribers to show the remote devices with this health level. This can aid you in troubleshooting those specific devices.

Summary Table

The Summary Table is located toward the bottom of the Summary screen. The Summary Table has two tabs: the **Devices Tab** and the **Alerts Tab**.

Devices Tab

The Devices tab displays a list of devices and provides configuration information, such as the name, location, and IP address, along with some additional metrics of interest.



Devices | Alerts

Status	Display Name	Device Model	IP Address	Availability(%)	Response Time Avg(ms) Current	Response Time Avg(ms) Average	Last Poll	Health	Topology
	Contains...	Contains...	Contain		min max	min max	min max		
	Orbit-5	Orbit MCR-900	10.10.12.5	100%	1	1	12-07-2017 04:35:38 PM		
	Orbit-6	Orbit MCR-LN4	10.10.12.6	100%	1	1	12-07-2017 04:35:38 PM		
	Orbit-4	Orbit MCR-900	10.10.12.4	100%	1	1	12-07-2017 04:35:38 PM		
	Orbit-8	Orbit MCR-LN4	10.10.12.8	100%	1	1	12-07-2017 04:35:38 PM		
	Orbit-3	Orbit MCR-900	10.10.12.3	100%	1	1	12-07-2017 04:35:38 PM		
	Orbit-2	MDS Orbit	10.10.12.2	100%	1	1	12-07-2017 04:35:38 PM		
	Orbit-7	Orbit MCR-LN4	10.10.12.7	100%	1	1	12-07-2017 04:35:38 PM		

The Devices Tab refreshes automatically every three minutes.

Click any text item in the first few columns to navigate to the Detail view for that device. For more information, see **Detail Views**.

Status Column

The Status column on the far left shows the current alert status for the device. The status icons (including fatal, critical, warning, or normal) represents the current health of the device. They indicate any outstanding, active or uncleared alerts.

Availability Column

The Availability column is a graphic image indicating the trend of the availability over the current time period (default is 4 hours). To view the actual data points over the time period, hover over the image or click the image.

Last Poll Column

The Last Poll column shows the last time GE PulseNET attempted a configuration or performance collection for the device. Hover over or click any metric value to see a graph that plots the selected metric across the time range you have selected.

Response Time Avg(ms) Column

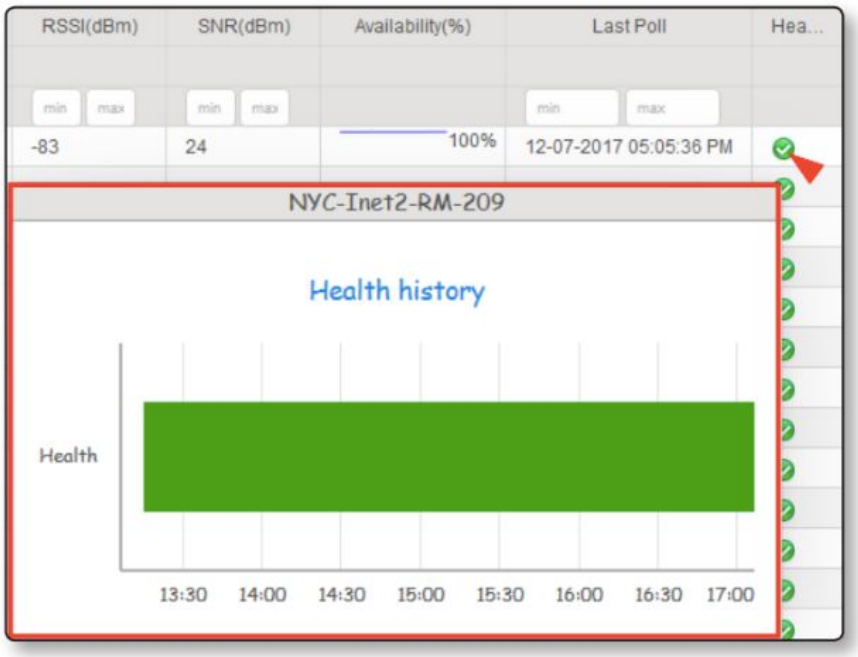
For Dlink master devices, the Current and Average Remotes Count values represent the total current and average number of devices that are downstream from the master, whether connected directly or indirectly. For SNMP access points, the Current and Average Remotes Count values represent the current and average number of devices that are directly associated to that access point.

When GE PulseNET is monitoring Dlink devices passively, Response Time is not collected.

Health Column

The Health Column on the far right shows the historical alert status of the device, including but not limited to the current status. The alert icons (including fatal, critical, warning, or normal) represent the most severe historical health status of the device over the current time period. By hovering or clicking on the icon, the health history is displayed in graphical form showing the time range currently being viewed (the default period is 4 hours).

By clicking on the individual Health History icon, you can open a dialog box that will display the outstanding alerts for that device. From this dialog box, you can acknowledge and clear the alerts. For information about acknowledging and clearing alerts, see **Working with Alerts**.



Topology Column

The last column in each row is a link to the Topology Viewer. For more information, see **Topology Viewer Icon**.

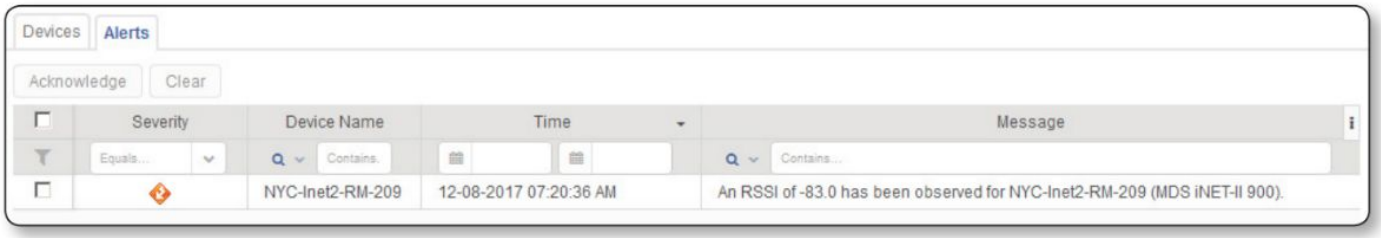
Alerts Tab

The Alerts tab lists outstanding alerts for the currently displayed device type or a specific device in a workflow. For example, if you click a warning Health icon on the Access Points tile, the Alerts tab lists all of the outstanding warning alerts for the access points that are being monitored.

For each alert in the list, the Alerts display provides the following information:

- An **Alert** icon that represents the severity fatal, critical, warning) of the alert
- The name of the device for which the alert was raised
- The time at which the alert was raised
- Whether the alert has been acknowledged
- Whether the alert has been cleared, and if so, the time it was cleared
- The alert message

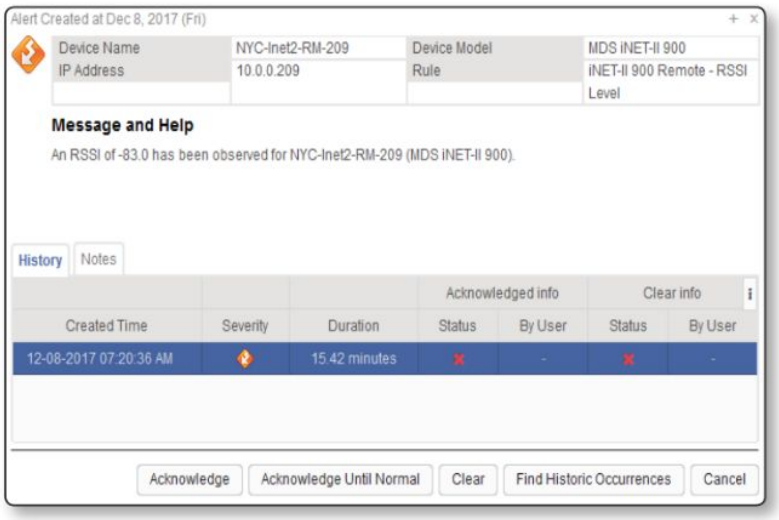
On the Alerts tab you may select one or more alerts in the table and either **Acknowledge** or **Clear** them.



Click any value in an alert row to open the Alert details dialog box. For more information, see the **Working with Alert Details** section below.

For an overview of all your device and host alerts, visit the **Alerts Management Dashboard** from the left-side main navigation menu. For more information about the Alerts Management Dashboard, see **Alerts Dashboard**.

Working with Alert Details



In the Alert details dialog box, you can perform the following actions:

- *Acknowledge* — Once an alert has been acknowledged, the By User column shows the GE PulseNET user who acknowledged the alert. If an acknowledged alert fires again at a later time (usually because the condition has occurred again), the Acknowledged Info column will show that the new condition is unacknowledged.
- *Acknowledge Until Normal* — This option is available for alerts that have not yet been cleared. The alert and all consecutive alerts fired by the same rule on the same object are acknowledged until the first alert fired after the alert source returns to a normal state. Select the alert and then click Acknowledge Until Normal. *Acknowledged Until Normal* and your user name appear in the Acknowledged Info column.
- *Clear* — In most cases, each alert is cleared automatically when the condition that triggered it is resolved. For example, an alert fires when a metric for a monitored device exceeds a certain threshold. If the metric value returns to within normal range, the original alert is cleared automatically. If the alert condition occurs again, the alert reappears.
- You should only clear alerts when they do not clear themselves. Clear an alert by clicking the Clear button. If the alerts list is set to show only current alerts, the cleared alerts are filtered from the list. If the list is filtered to show cleared alerts too, then cleared alerts will also appear with a green checkmark icon.
- *Find Historical Occurrences* — Click Find Historical Occurrences to open the Alert Historic Occurrences view. This view displays the historical occurrences of an alert, starting from the beginning of the current time range. Use << Get More and Get More >> to scroll through more historical occurrences. (If there are 15 or fewer historical occurrences, Get More links are not provided.)
- *Cancel* — Click Cancel to close the Alert Details dialog box.

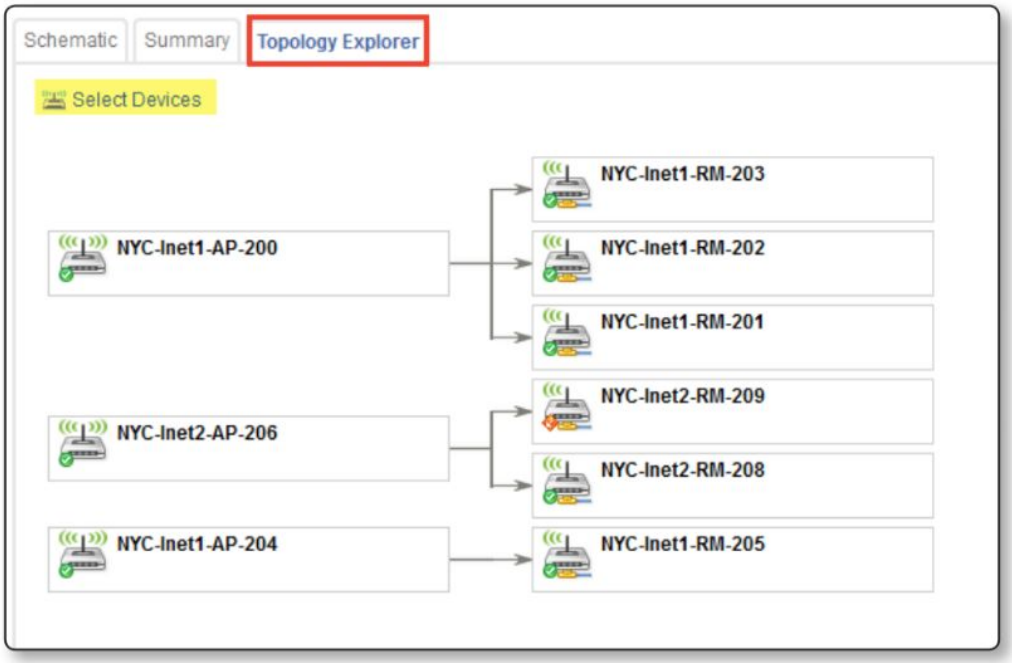
Topology Explorer Tab

The Topology Explorer is a way to represent a logical hierarchy of connected devices.

Displaying the Logical Device Hierarchy

1. From the Summary dashboard, click the **Topology Explorer** tab.
2. Click **Select Devices**.
3. In the Selection dialog box that appears, select one or more devices from the list.
4. Click **Map**.

The devices and any associated downstream devices are displayed in a tree view.



The display control in the upper right corner allows you to select how many hierarchical levels of connected devices you want to see in the tree.

You can alternate between the Minimized and Normal zoom levels using the Zoom Level controls at the top right of the tree view. The Minimized view only shows each device's name and type icon, while the Normal view includes information on the device's currently availability. The more devices you select, the more you will have to pan around the mini-map to view all selected devices. Click within the mini-map and drag the shaded rectangle to pan around the topology diagram.

Hover the cursor over a device to view its configuration details. Click a device to navigate to its Detail view. For more information, see **Detail Views** below.

Detail Views

The Detail view provides the configuration, availability, and performance details for a device. It checks for new data every three minutes and refreshes when new data is available. Much of the information provided on the Detail view depends on the time range setting. For example, if the time range is changed, then the performance graphs will reflect statistics for those values that were collected during that specific time interval.

Device Display Panels

The Detail view is divided into two panels: the Summary panel at the top of the view and the tabbed Metrics panel below.

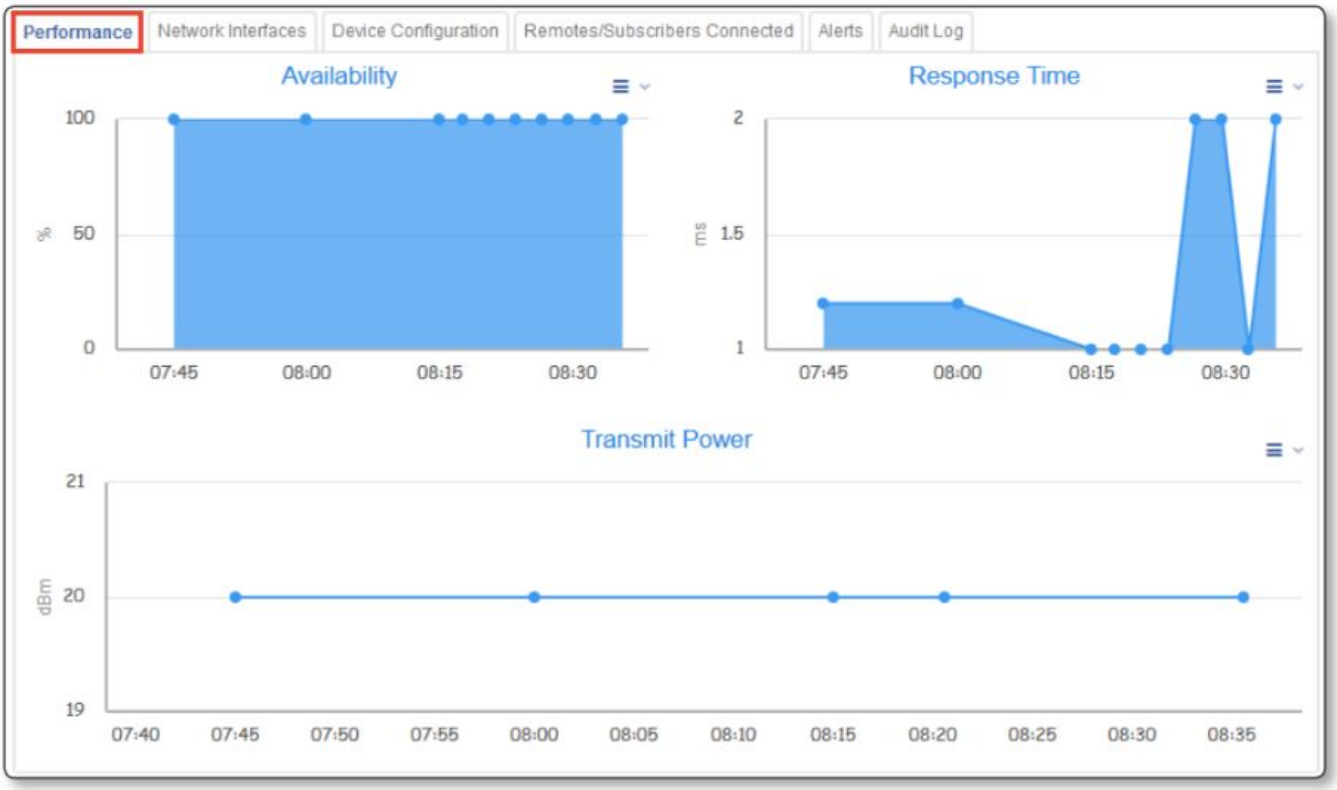
The Summary panel displays configuration information for the device, such as the IP address, serial number, and last poll time. Most of this information is obtained by reading values from the devices themselves.

Device Contact	-		-	**Status**	Operational
IP Address	10.0.0.200	**GPS Position**	-	**Uptime**	19 days, 01 hours
Serial Number	1953254	**Location**	Manhattan, New York	**Last Poll**	12-08-2017 08:20:37 AM
Description	PN Lab	**Device Name**	NYC-Inet1-AP-200	**Last Config Poll**	12-07-2017 12:00:01 PM

The Metrics panel for a device will include some or all of the following tabs: Performance, Device Configuration, Remotes Connected, Network Interfaces, Alerts, Change Diary, Audit Log.

Performance Tab

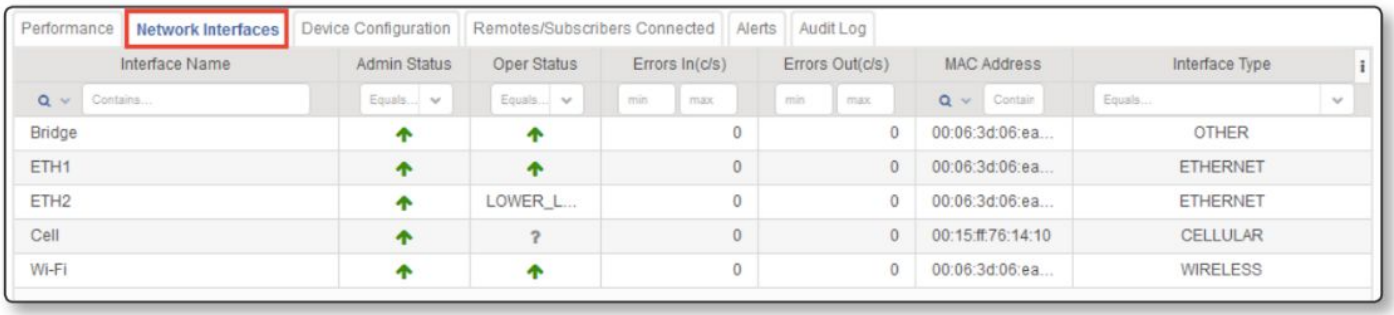
The Performance tab provides a number of metrics and graphs that pertain to the performance of the device.



If you hover the cursor over a particular metric on a chart, you are shown the exact value for that data point. You can change a chart from one type to another to view the displayed information in a different format or zoom into a chart. For more information, see **Working with Graphs**.

Network Interfaces Tab

The Network Interfaces tab displays a list of network interfaces that are configured on the device, and it provides information about each interface.



Interface Name	Admin Status	Oper Status	Errors In(c/s)	Errors Out(c/s)	MAC Address	Interface Type
Bridge	↑	↑	0	0	00:06:3d:06:ea...	OTHER
ETH1	↑	↑	0	0	00:06:3d:06:ea...	ETHERNET
ETH2	↑	LOWER_L...	0	0	00:06:3d:06:ea...	ETHERNET
Cell	↑	?	0	0	00:15:ff:76:14:10	CELLULAR
Wi-Fi	↑	↑	0	0	00:06:3d:06:ea...	WIRELESS

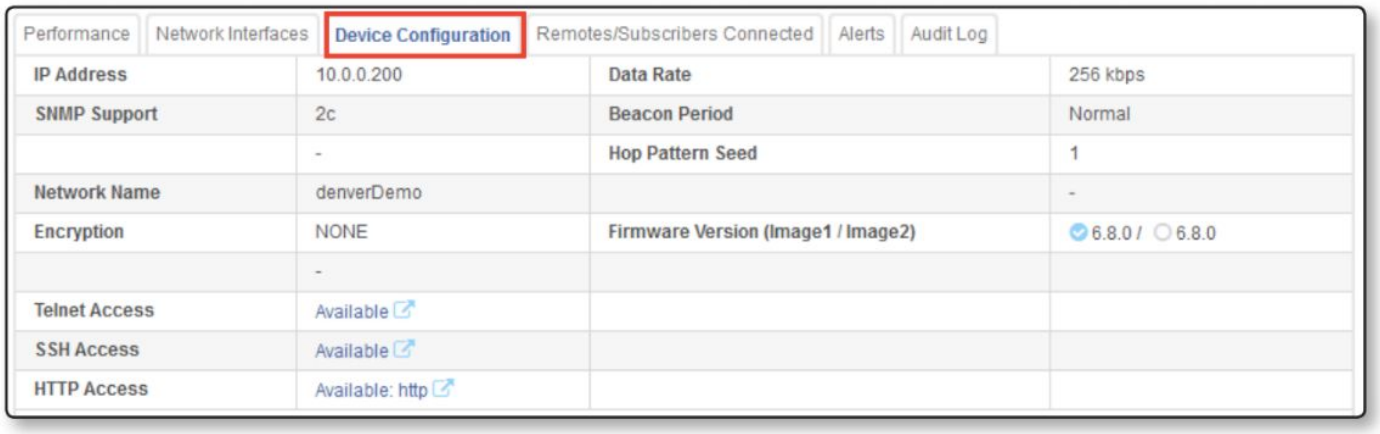
For each network interface listed, the tab provides the following information if it is available from the device. Some devices provide more interface metrics than others.

- The name of the network interface
- The status (admin and operational) of the network interface
- The min and max throughput in
- The min and max throughput out
- The min and max errors in
- The min and max errors out
- The MAC address of the network interface
- The type of network interface

Hover the cursor over any metric value to see a chart that plots the metric over a specific interval. The time over which any metric is plotted on a chart depends on the time range setting.

Device Configuration Tab

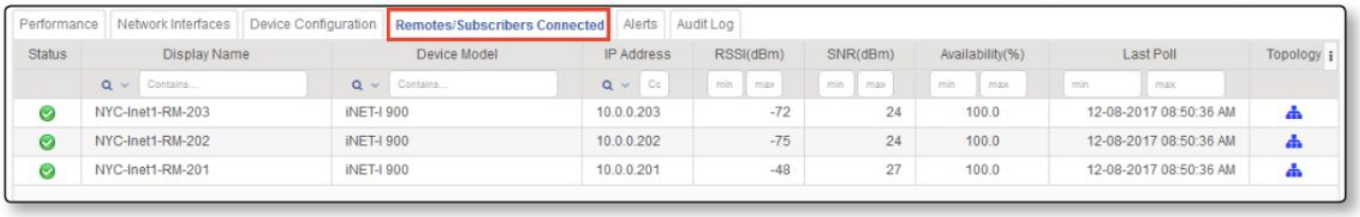
The Device Configuration tab provides configuration information collected directly from a device based on the collection schedule that has been configured (see “Collection Schedules” in the Administration Guide for additional information).



If a device is configured to allow communication through Telnet, SSH, or HTTP, the Device Configuration tab provides access to the device through a corresponding link, located toward the bottom left of the tab.

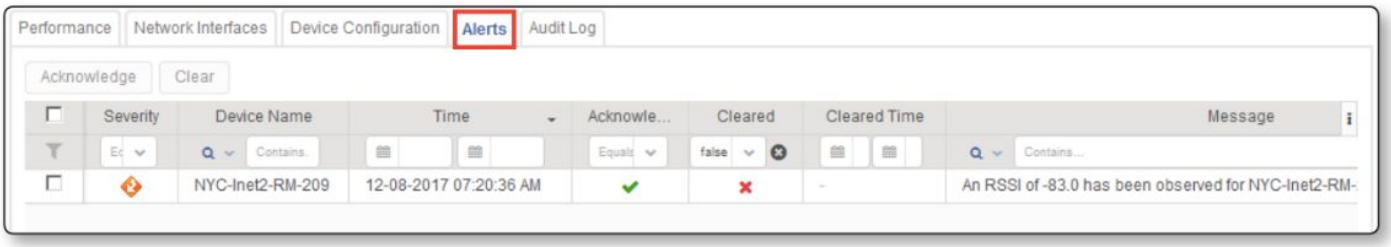
Remotes/Subscribers Connected Tab

This tab is only applicable to Access Point/Master devices. The Remotes/Subscribers Connected tab lists the authorized remotes that are connected to the access point or master, and the table provides some summary information for those remote devices.



Alerts Tab

The Alerts tab lists any active alerts for this device. The alerts that appear in the list depend on the alert filters shown at the top of each column in the table.

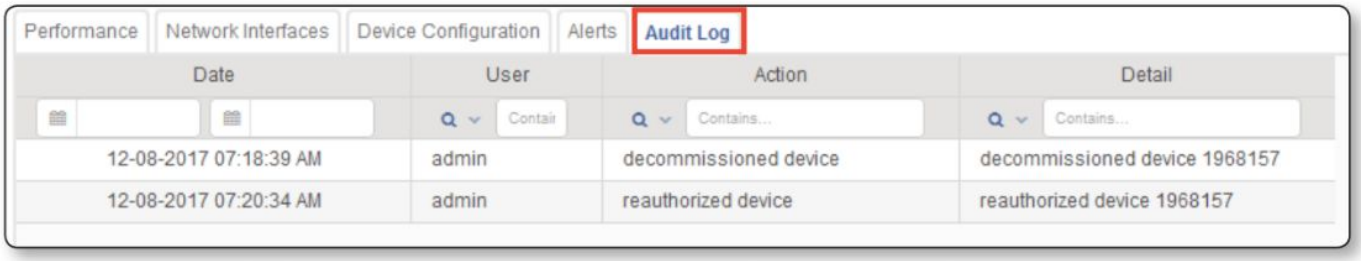


From the Alerts tab, you can acknowledge and clear alerts as you would using the Alert

History dialog box. For information about acknowledging and clearing alerts, see **Working with Alerts**.

Audit Log Tab

The Audit Log tab provides a list of the changes that have been made within GE PulseNET for this device. Each log entry shows the date and time an operation was performed, the name of the GE PulseNET user who initiated the operation, the action that was performed and any associated details.



Topology Viewer Icon

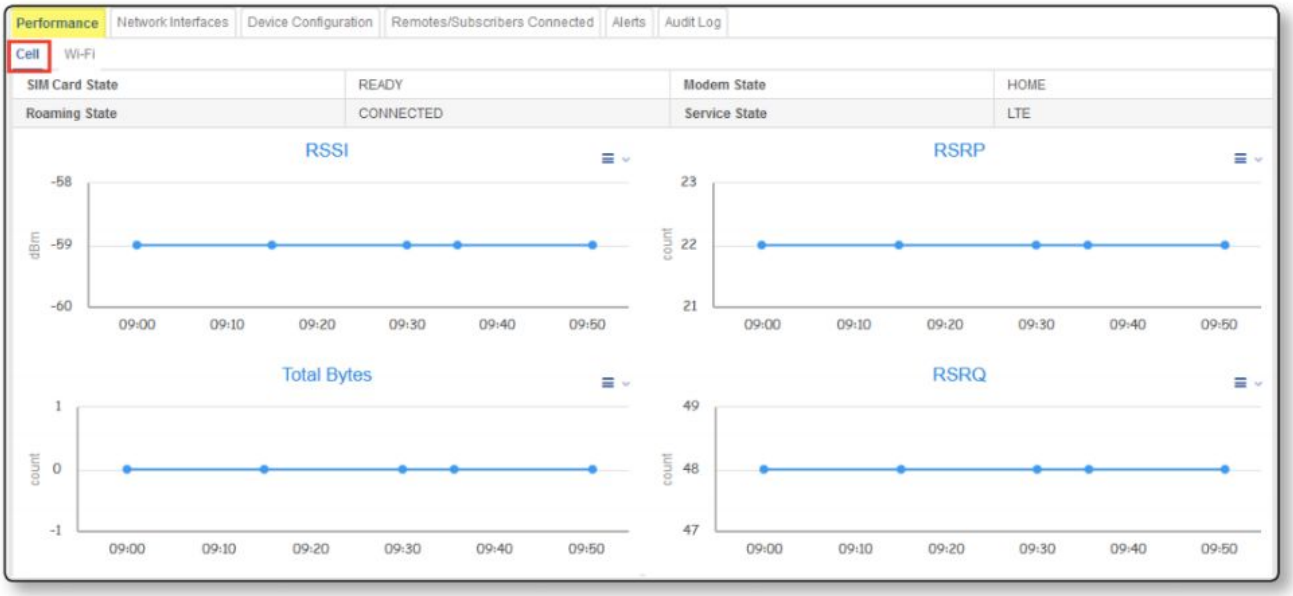
You can access the Topology Viewer from a device list by clicking the Topology Viewer icon in the row for a particular device. For information about device lists, see **Devices Tab**. You can also access the Topology Viewer from any Detail view by clicking the Topology Viewer icon on the far right of the view. For information about Detail views, see **Detail Views**. Navigate within the Topology Viewer the same way that you navigate within the Topology Explorer. For a description of this navigation, see **Topology Explorer Tab**.

Additional features for the Orbit Platform

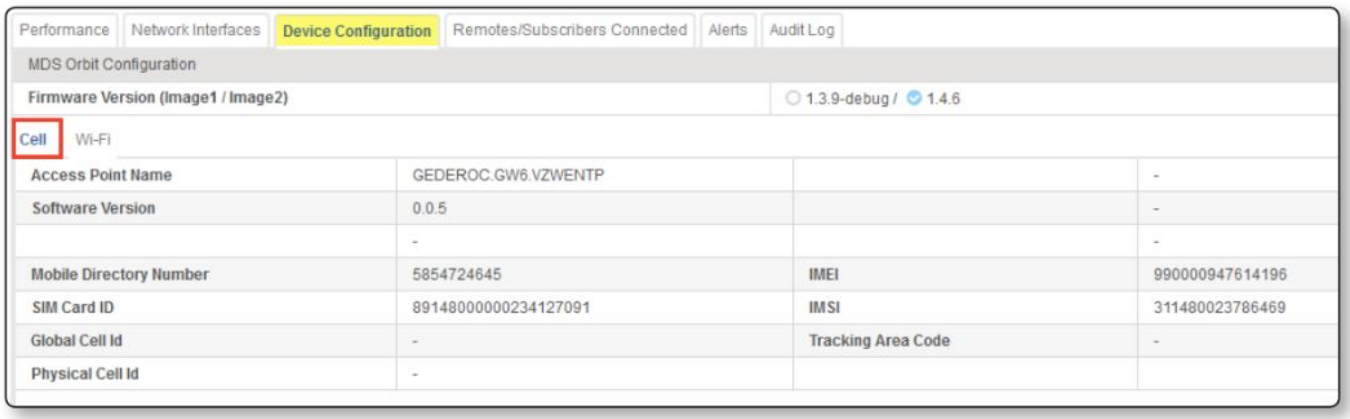
The GE MDS Orbit Platform is capable of housing more than one network interface, in addition to the on-board Ethernet and bridge interfaces. PulseNET represents each of the additional interfaces by displaying separate sub-tabs under the Performance and Configuration tabs.

Cellular Interface

Performance information for the cellular interface can be viewed by clicking the Cell tab under the Performance tab on an Orbit device. Cellular performance metrics include the SIM card state, roaming state, modem state, and service state. It also displays graphs for cellular RSSI, RSRP, RSRQ, and total bytes transferred.

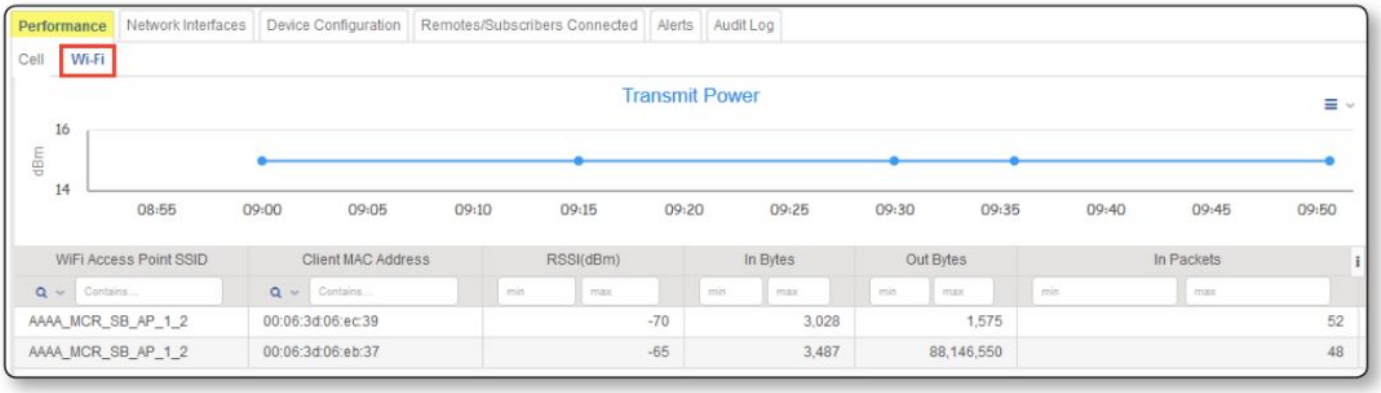


Configuration information for the cellular interface can be viewed by clicking the Cell tab under the Device Configuration tab on an Orbit device. Cellular configuration parameters include the Access Point Name, software version, mobile directory number, SIM card ID, global cell ID, physical cell ID, IMEI, IMSI, and tracking area code.

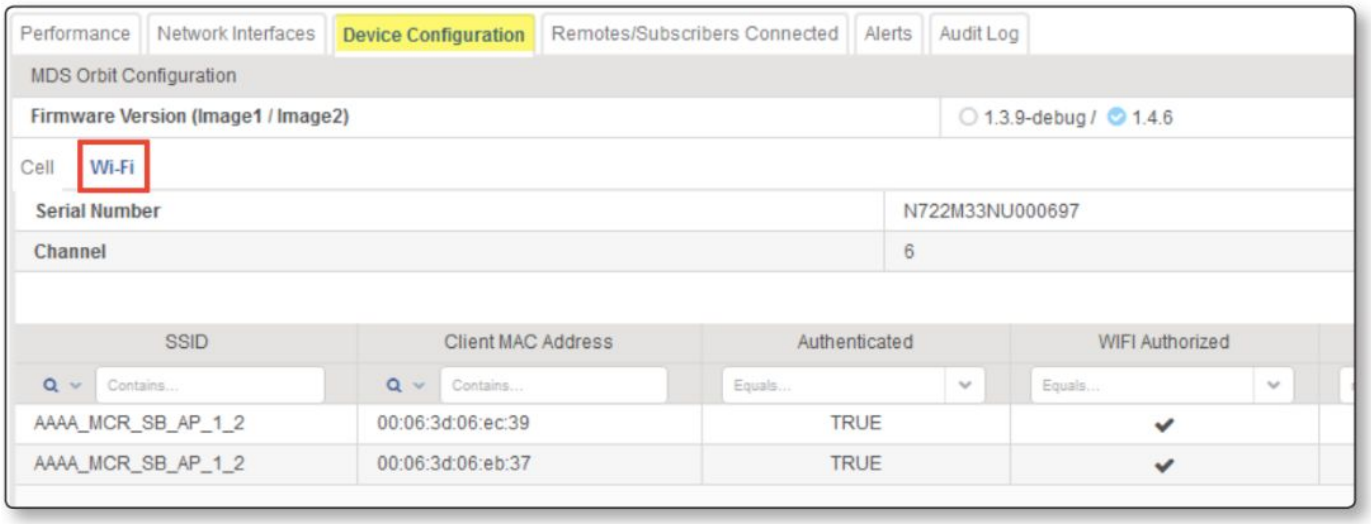


Wireless Interface

Performance information for the wireless interface can be viewed by clicking the Wifi tab under the Performance tab on an Orbit device. Wireless performance metrics include the transmit power and a table listing each wifi client that is connected.



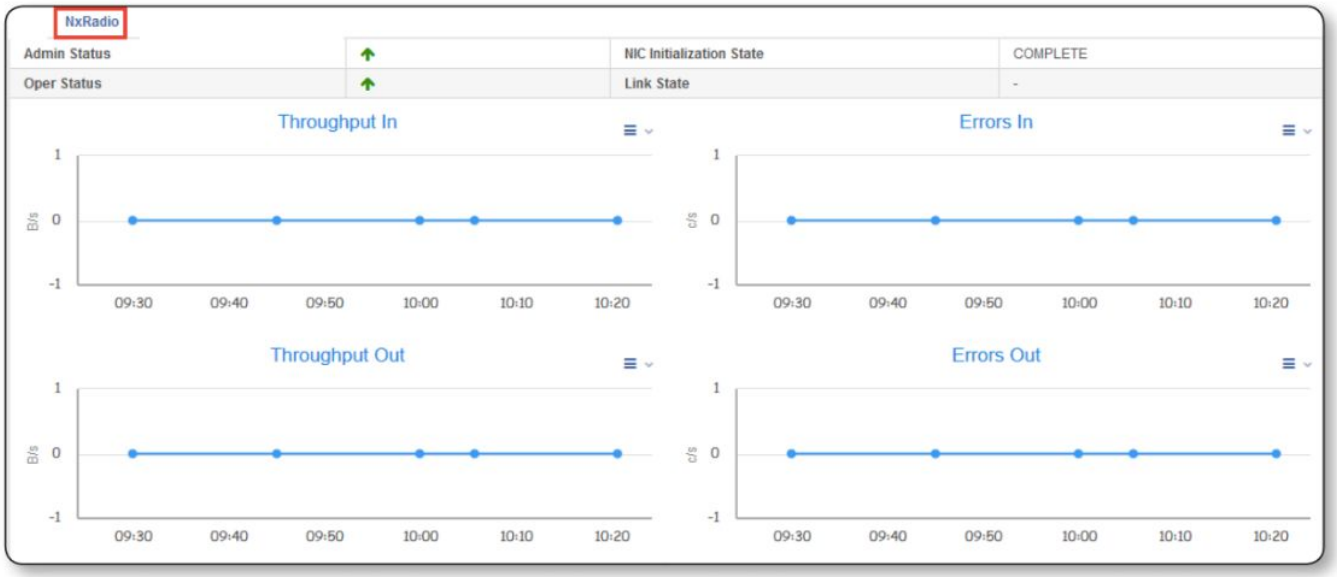
Configuration information for the wireless interface can be viewed by clicking the Wifi tab under the Device Configuration tab on an Orbit device. Wireless configuration parameters include the serial number, wireless channel and a list of parameters for each connected client.



NX Interface

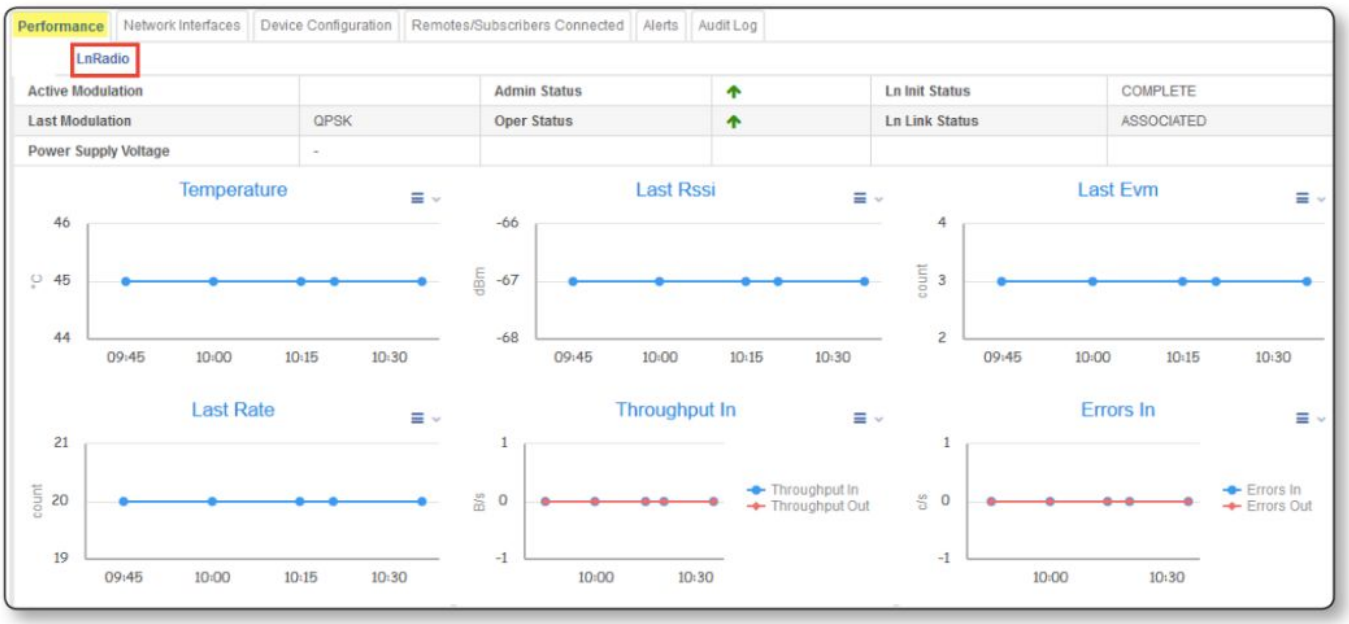
Performance information for the Orbit NX interface can be viewed by clicking the NxRadio tab under the Performance tab on an Orbit device. NX performance metrics include the administrative and operational status, the NIC initialization state, the link state, as well as performance graphs for interface throughput and errors.

Configuration parameters for the Orbit NX interface include the current modem type and the device mode (access point or remote).



LN Interface

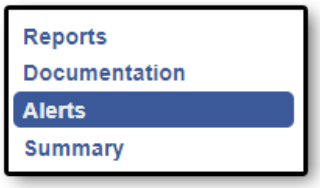
Performance information for the Orbit LN interface can be viewed by clicking the LnRadio tab under the Performance tab on an Orbit device. LN performance metrics include active modulation, previous modulation, power supply voltage, administrative and operational status, LN initialization state, link status, as well as graphs for temperature, RSSI, EVM, data rate, throughput, and errors.

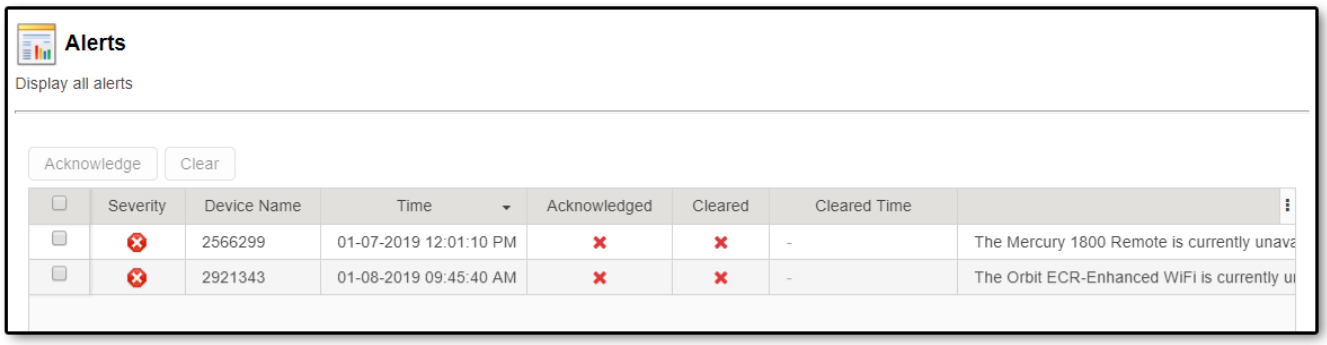


Configuration information for the Orbit LN interface includes the device mode (access point or remote), active channel, FEC setting, and the active TX and RX frequencies.

Alerts Dashboard

This section describes the **Alerts** dashboard, which allows you to see an overview of all of your device or host alerts. Open the left-side Navigation panel and click on **Alerts** to see the **Alerts Management View**.





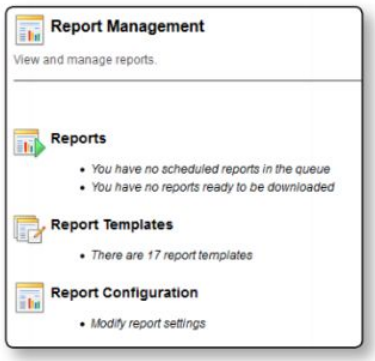
In the **Alerts Management View** window, a table will appear (pictured above) with a complete list of all device and host alerts on your network. In order to sort these alerts, click on the table headers of each column. The alerts can be sorted according to severity, device name, time or status.

Click the **Acknowledge** button to assign the alert to yourself. Click the **Clear** button to clear the alert from the table.

To see more details about the individual alert, click on the alert line in the table to go to the **Alert Details** dialog box. For more information about working with alerts, see the **Working with Alert Details** section above.

Working with Reports

Reports are a convenient way to share data about your monitored environment with others in your organization. A report can also provide a quick, high-level perspective on your data. You can generate a report using one of the predefined report templates included in GE PulseNET, or you can create your own custom report template.

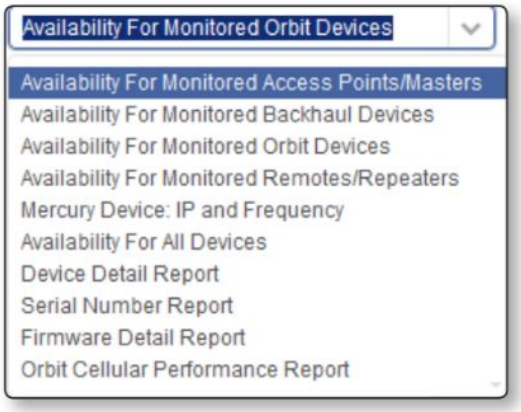


This section describes the **Reports** dashboard, which is your starting point for working with reports. Use it for generating new reports, scheduling reports, deleting previous reports, and downloading reports. Open the left-side Navigation panel and click on Reports to see the Report Management view.

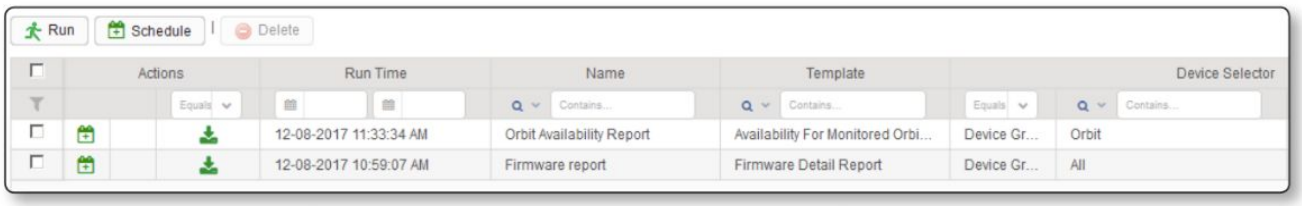
Managing Reports

Click Reports to see the GE PulseNET reporting controls. You can run a report immediately or schedule a report to be run at a later time. You can also delete an existing report by selecting it and clicking the Delete button.

Running a Report Now

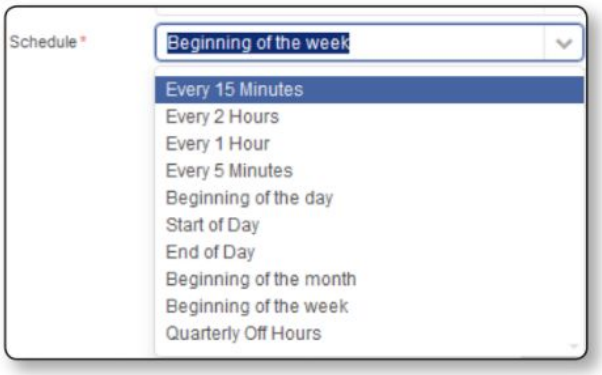


1. Click the **Run** button to open the report setup display to enter information for the required fields and any other optional fields as necessary.
2. Enter a name for your report and select a report template from the list of available reports.
3. Select a report format (PDF or CSV).
4. Enter optional email recipients for this report.
5. Select the time range for the report. You may click the **Edit** icon at the end of this field to select an alternate time range from the dropdown list.
6. If the report is not defined to run for a specific device group, you can select the device for which this report will include data by clicking the **Edit** icon at the right of this field. You may also click the running man icon to view a list of the devices for which data will be included in this report.
7. Click **Save** to save and execute this report.
8. After the report has run, it will appear in the report table and you may download the report or select an application to view the report. Click the **Download** icon to download a copy of the report to your local machine. If you want to allow this report to run on a scheduled basis, you can click the **Calendar** icon to set up the schedule frequency on which to run the report. Each report will remain available for downloading in the reports table until it is manually deleted.



Running a Report at a Scheduled Time

1. Click the **Schedule** button to open the report setup display to enter information for the required fields and any other optional fields as necessary.
2. Enter a name for your report and select a report template from the list of available reports.
3. Select a report format (PDF or CSV).
4. Enter optional email recipients for this report.
5. Select the time range for the report. You may click the edit icon at the end of this field to select an alternate time range from the dropdown list.
6. Select a schedule for your report. You may choose a schedule from the dropdown list, or you may create a new schedule by clicking the **Plus** icon to add a schedule. You may also set the number of old reports to be kept in the report table for future reference.



7. If the report is not defined to run for a specific device group, you can select the devices for which this report will include data by clicking the **Edit** icon at the right of this field. You may also click the **Running Man** icon to view a list of the devices for which data will be included in this report.
8. Click **Save** to save and schedule this report.
9. Once the scheduled report appears in the reports table, you also have the option to disable, edit, or run the scheduled report. Click the **Calendar** icon to disable, the **Edit** icon to modify, or the **Running Man** icon to run your scheduled report.

Appendix

Regular Expression Wildcard Details

Matching Characters

Wildcard	Matches
x	The character x
\\	The backslash character
\0n	The character with octal value 0n (0 <= n <= 7)
\0nn	The character with octal value 0nn (0 <= n <= 7)
\xhh	The character with hexadecimal value 0xhh
\t	The tab character ('\u0009')
\n	The newline (line feed) character ('\u000A')
\r	The carriage-return character ('\u000D')
\f	The form-feed character ('\u000C')
\a	The alert (bell) character ('\u0007')
\e	The escape character ('\u001B')
\cx	The control character corresponding to x

Logical operators

Wildcard	Matches
XY	X followed by Y
X|Y	Either X or Y

Matching with Character Classes

Wildcard	Matches
[abc]	a, b, or c (simple class)
[^abc]	Any character except a, b, or c (negation)
[a-zA-Z]	a through z or A through Z, inclusive (range)
[a-d[m-p]]	a through d, or m through p: [a-dm-p] (union)
[a-z&&[def]]	d, e, or f (intersection)
[a-z&&[^bc]]	a through z, except for b and c: [ad-z] (subtraction)
[a-z&&[^m-p]]	a through z, and not m through p: [a-lq-z](subtraction)

Matching with Predefined Character Classes

Wildcard	Matches
.	Any single character
\d	A single digit: [0-9]
\D	A single non-digit: [^0-9]
\s	A single whitespace character: [\t\n\x0B\f\r]
\S	A single non-whitespace character: [^\s]
\w	A single word character: [a-zA-Z 0-9]
\W	A single non-word character: [^\w]

Matching with POSIX character classes (US-ASCII only)

Wildcard	Matches
\p{Lower}	A single lower-case alphabetic character: [a-z]
\p{Upper}	An single upper-case alphabetic character:[A-Z]
\p{ASCII}	All ASCII:[\x00-\x7F]
\p{Alpha}	An alphabetic character:[\p{Lower}\p{Upper}]
\p{Digit}	A single decimal digit: [0-9]
\p{Alnum}	An alphanumeric character:[\p{Alpha}\p{Digit}]
\p{Punct}	Punctuation: One of !"#$%&'()*+,-./:;<=>?@[\]^_`{|}~
\p{Graph}	A single visible character: [\p{Alnum}\p{Punct}]
\p{Print}	A single printable character: [\p{Graph}\x20]
\p{Blank}	A single space or a tab: [\t]
\p{Cntrl}	A single control character: [\x00-\x1F\x7F]
\p{XDigit}	A single hexadecimal digit: [0-9a-fA-F]
\p{Space}	A single whitespace character: [\t\n\x0B\f\r]

Boundary Matches

Wildcard	Matches
^	The beginning of a line
$	The end of a line
\b	A word boundary
\B	A non-word boundary
\A	The beginning of the input
\G	The end of the previous match
\Z	The end of the input but for the final terminator, if any
\z	The end of the input

Greedy quantifiers

Wildcard	Matches
X?	X, zero or once
X*	X, zero or more times
X+	X, one or more times
X{n}	X, exactly n times
X{n,}	X, at least n times
X{n,m}	X, at least n but not more than m times

Reluctant quantifiers

Wildcard	Matches
X??	X, zero or once
X*?	X, zero or more times
X+?	X, one or more times
X{n}?	X, exactly n times
X{n,}?	X, at least n times
X{n,m}?	X, at least n but not more than m times

Possessive quantifiers

Wildcard	Matches
X?+	X, zero or once
X*+	X, zero or more times
X++	X, one or more times
X{n}+	X, exactly n times
X{n,}+	X, at least n times
X{n,m}+	X, at least n but not more than m times

About GE MDS

Over two decades ago GE MDS began building radios for business-critical applications. Since then we have installed millions of radios in countries across the globe. We overcame impassable terrain, brutal operating conditions, and complex network configurations to succeed. We also became experts in wireless communication standards and applications worldwide. The result of our efforts is that today thousands of organizations around the world rely on GE MDS wireless networks to manage their critical assets.

The majority of GE MDS radios deployed since 1985 are still installed and performing within our customers' wireless networks. That's because we design and manufacture our products in-house, according to ISO 9001, which allows us to meet stringent global quality standards. Thanks to our durable products and comprehensive solutions, GE MDS is the wireless leader in industrial automation—including oil and gas production and transportation, water/wastewater treatment, supply, and transportation, electric transmission and distribution, and many other applications. GE MDS is also at the forefront of wireless communications for private and public infrastructure and online transaction processing. As your wireless needs change, you can continue to expect more from GE MDS. We'll always put the performance of your network above all.

GE MDS ISO 9001 Registration

GE MDS adheres to the internationally-accepted ISO 9001 quality system standard.

To GE Customers

We appreciate your patronage. You are our business. We promise to serve and anticipate your needs. We will strive to give you solutions that are cost effective, innovative, reliable and of the highest quality possible. We promise to engage in a relationship that is forthright and ethical, one that builds confidence and trust. Data sheets, frequently asked questions, application notes, firmware upgrades and other updated information is available on the GE MDS Web site.

Manual Revision and Accuracy

This manual was prepared to cover a specific version of our product. Accordingly, some screens and features may differ from the actual version you are using. While every reasonable effort has been made to ensure the accuracy of this guide, product improvements may also result in minor differences between the manual and the product shipped to you. If you have additional questions or need an exact specification for a product, please contact our Customer Service Team using the information below. In addition, manual updates can often be found on the GE MDS Web site.

About End 2 End Technologies

End 2 End (E2E) Technologies offers a unique combination of wireless communications and information technology expertise. We improve efficiency, reduce risk and lower the cost of industrial field operations via modernization and management of our customer's wireless communications networks. From initial planning through lifecycle support we assist your team in adopting a wireless solution that keeps communication costs low while maximizing network reliability and performance. For more information visit us at www.e2etechinc.com.

Customer Support

If you have problems, comments, or questions pertaining to the GE PulseNET application, please contact GE MDS via one of the methods below:

Phone: 585-241-5510
Email: gemds.techsupport@ge.com
Fax: 585-242-8369

License Credits

GE PulseNET contains several third party components. Please refer to the complete list of these components at www.e2etechinc.com/index.php/about/legal.