PDU support in OpenManage Enterprise Power Manager

Within the scope of Dell EMC OpenManage Enterprise console and Power Manager plugin

Abstract

This whitepaper provides guidance to use Power Distribution Unit (PDU) devices by monitoring them in Power Manager plugin.

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Revisions

Date	Description
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Acknowledgments

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Table of contents

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Acronyms

Acronym	Expansion
OME	Open Manage Enterprise
PMP	Power Manager Plugin
OMEPM	Open Manage Enterprise Power Manager
iDRAC	Integrated Dell Remote Access Controller
CMC	Chassis Management Controller
MSM	Modular System Management
MCM	Multi Chassis Management
MM	Management Module
REST	REpresentational State Transfer
GUI	Graphical User Interface
EPR	Emergency Power Reduction
PDU	Power Distribution Unit
API	Application Programming Interface
CSV	Comma-separated values
SNMP	Simple Network Management Protocol

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Executive summary

Use this whitepaper to monitor Power Distribution Units (PDUs) of supported brands in OpenManage Enterprise using Power Manager plugin. This also covers the inventory and alert management of PDU devices. It also covers methods for associating PDU to rack physical groups.

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1 PDU Devices

Power Distribution Units are devices used to supply power to devices like server, storage and network equipment mounted on a datacenter rack. Smart PDUs are power distribution units which are having remote management capabilities. Power Manager 2.0 adds the ability of monitoring PDU devices from the following manufacturers on OpenManage Enterprise 3.6.1 and above.

- Vertiv Geist
- APC by Schneider Electric

1.1 Discovering PDU(s)

This section explains how Power Distribution Units can be discovered on OpenManage Enterprise where Power Manager Plugin is installed.

Figure 1   Discovery of PDU

Discovery of PDU devices are very similar to discovery of other devices which are monitored over SNMP. SNMP version v1 or v2c are used for discovering PDU.

1. Create a new discovery job by clicking **Create** button from **Discovery** page.
2. Select **PDU** from **Device Type** dropdown.
3. Enter IP address of the PDU in **IP/Hostname/Range** field.
4. Enter community string in **SNMP Credentials** section.
5. Click **Finish** button.

The PDU is discovered after the discovery job is completed.

Note: PDUs discovered in OME is deleted automatically when Power Manager is uninstalled. Hence, ensure that Power Manager is installed and enabled to work with all PDU related features.

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1.2 PDU devices built-in group

A new built-in group named PDU Devices is displayed under SYSTEM GROUPS on Devices page in OME. All PDU devices discovered in OpenManage Enterprise are automatically listed under PDU Devices group.
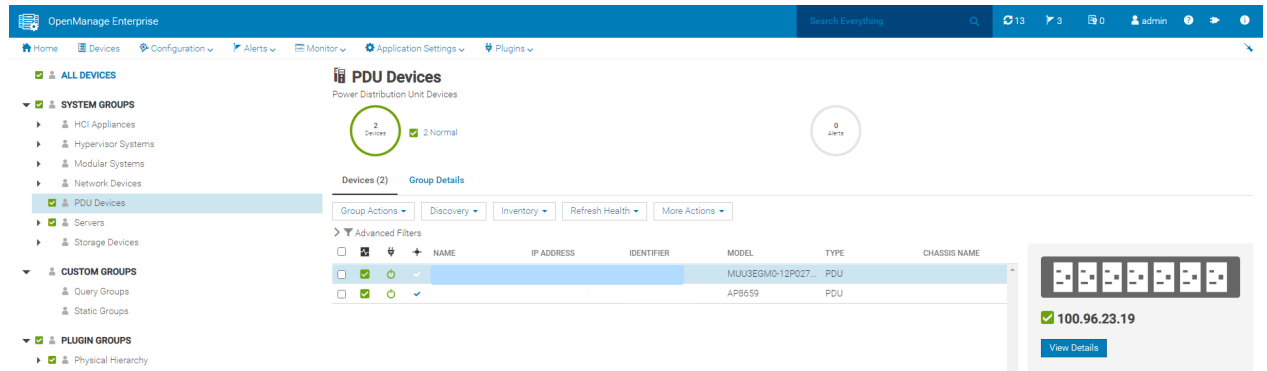

Figure 2   PDU devices built-in group

1.3 PDU device inventory information

View detailed inventory of PDU devices by navigating to the device details page of a PDU.
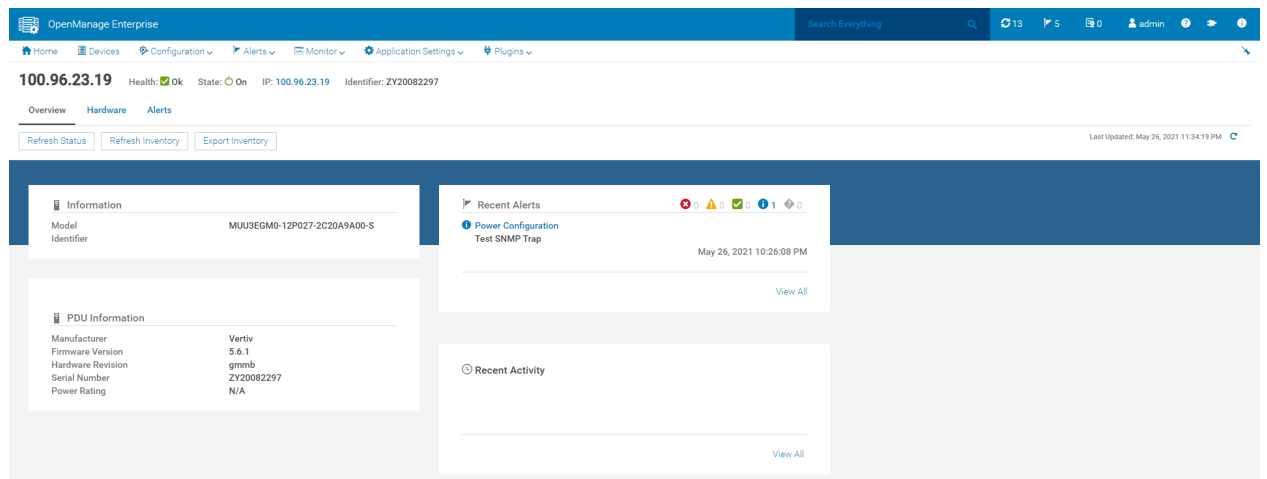

Figure 3   PDU device overview

Overview page shows all basic inventory details of the PDU.
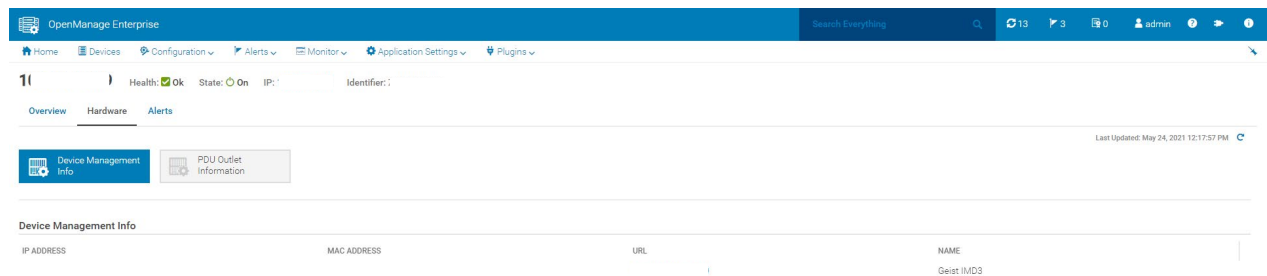
Figure 4   Hardware: Device Management Info

Device Management Info show IP address and name of the device.
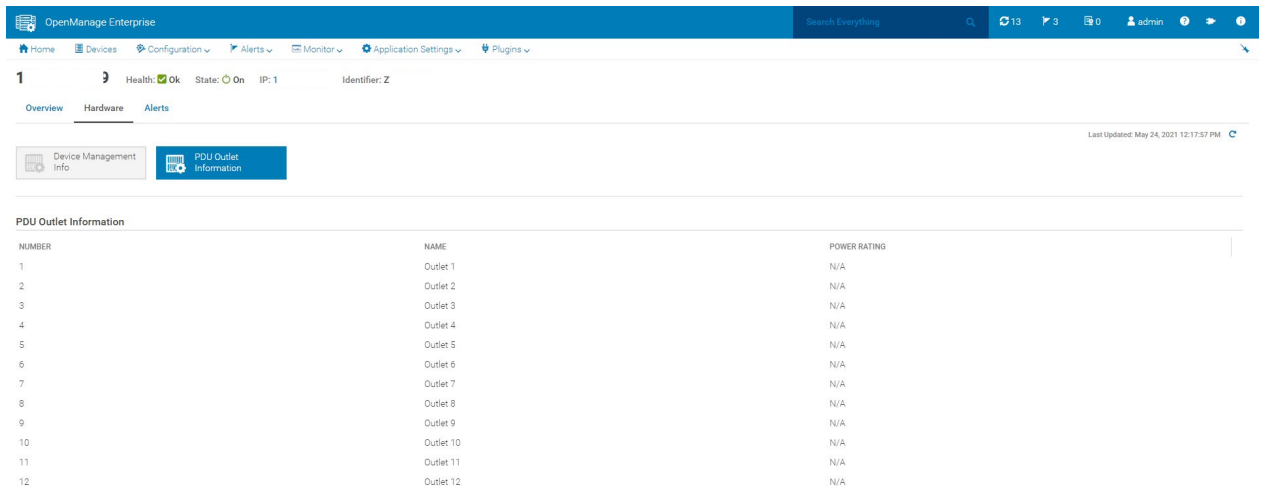
Figure 5   Hardware: PDU Outlet Information

PDU Outlet Information lists the number and name of outlets.

Figure 6   PDU: Device Alerts

Alerts tab lists alerts received from the PDU.

1.4   Alerts or MIB

Figure 7   Alerts

Alerts page in OME also lists alerts received from all PDU devices.

The details of traps that are supported by the discovered PDUs are visible under **MIB** tab under **Monitor** page. The table lists the traps that are supported by Vertiv Geist and APC PDUs.

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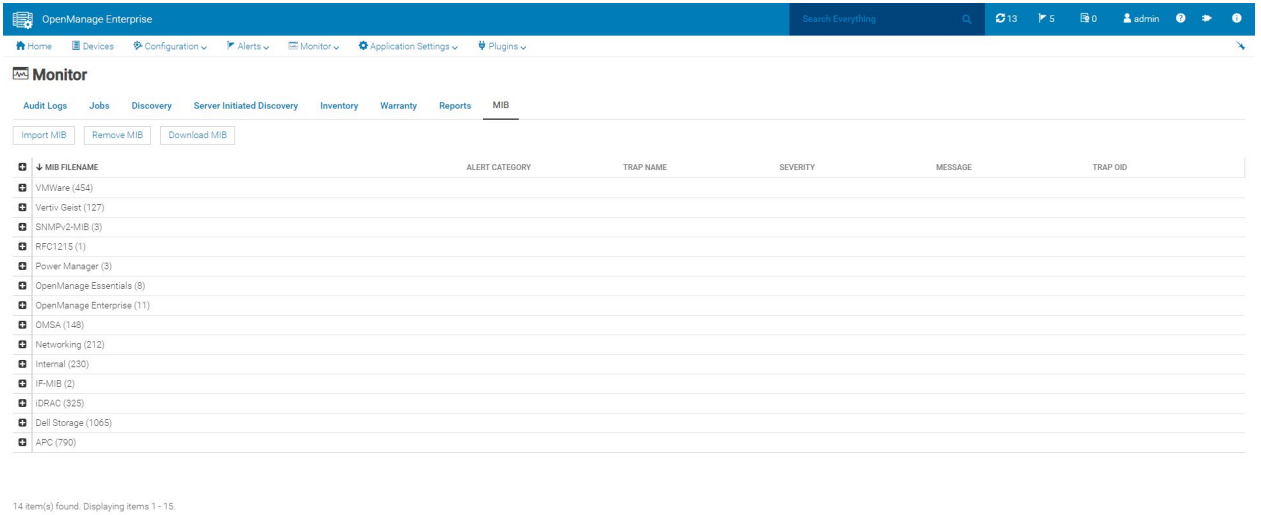
Figure 8   MIB

You can create alert policies for associating actions such as trap forwarding or sending emails upon receipt of traps from PDU. In **Create Alert Policy** wizard,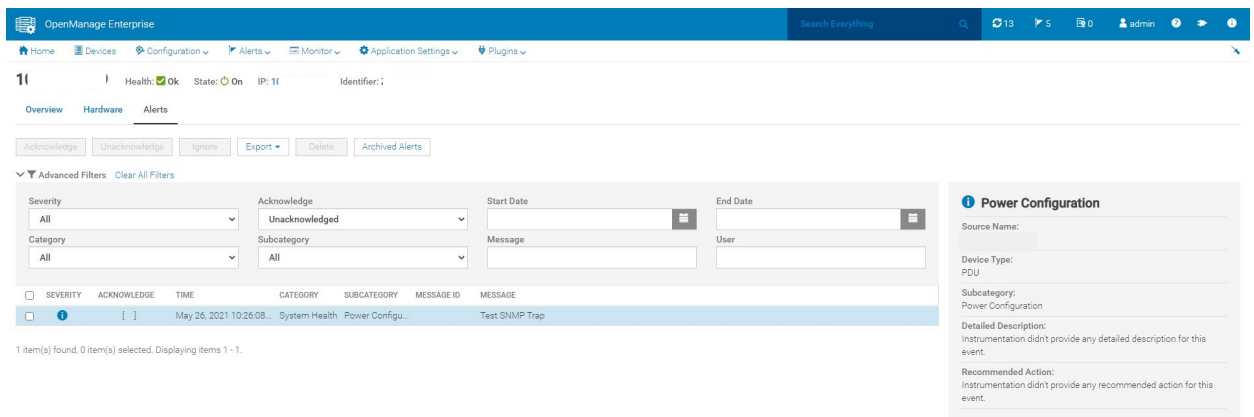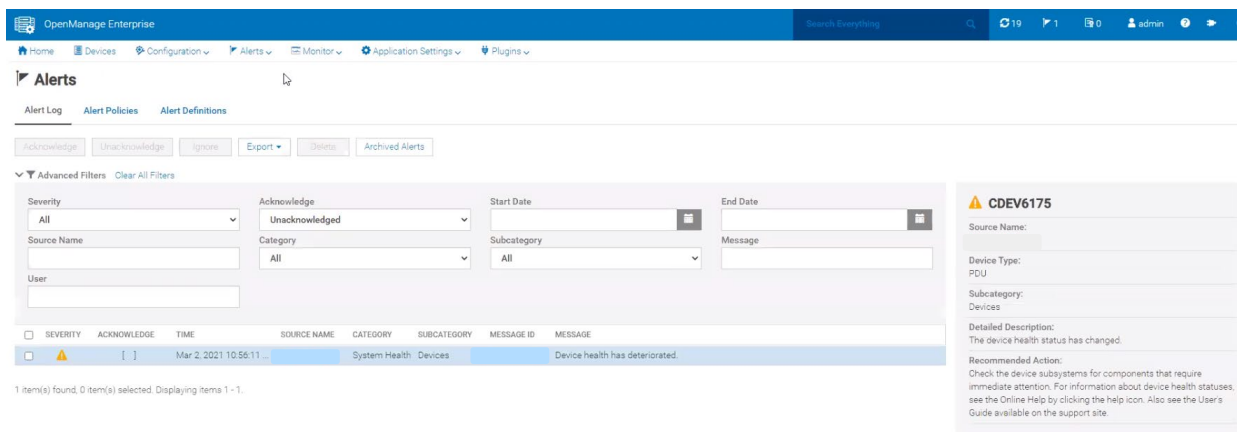 under **Category** selection step, choose the category and subcategory under desired PDU models, either **APC** or **Vertiv Geist**.

Figure 9   Alert Policy: Category selection

1.5   Scale support

Power Manager 2.0 supports monitoring of 8000 nodes including servers, chassis, PDUs and Virtual Machines. The maximum recommended number of PDUs are one thousand.

2   PDU metrics

In Power Manager plugin, the PDU(s) must be associated to rack physical groups to monitor rack-level power consumption. Associating a PDU to a rack automatically adds that PDU to the Power Manager monitoring list.

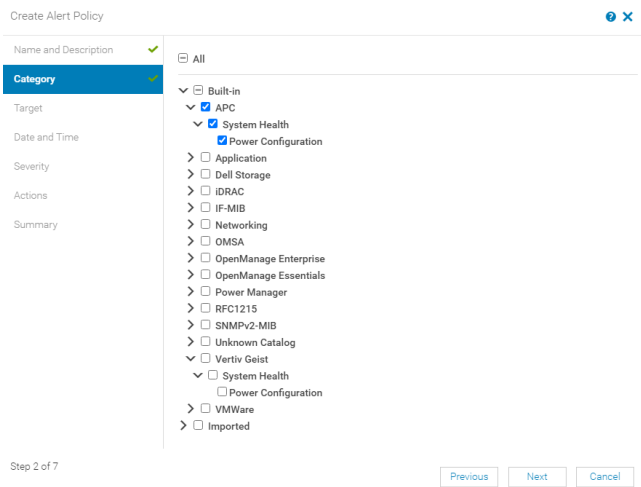## 2.1   Associating PDU(s) to rack

Ensure that the PDU(s) are associated to a rack (or rack group) to monitor rack-level power consumption. Associating a PDU to a rack automatically adds that PDU to the Power Manager monitoring list.

This sub-section explains how to associate a PDU device to a rack group.

1.   Right-click on any rack physical group and select **Manage Rack** menu option.
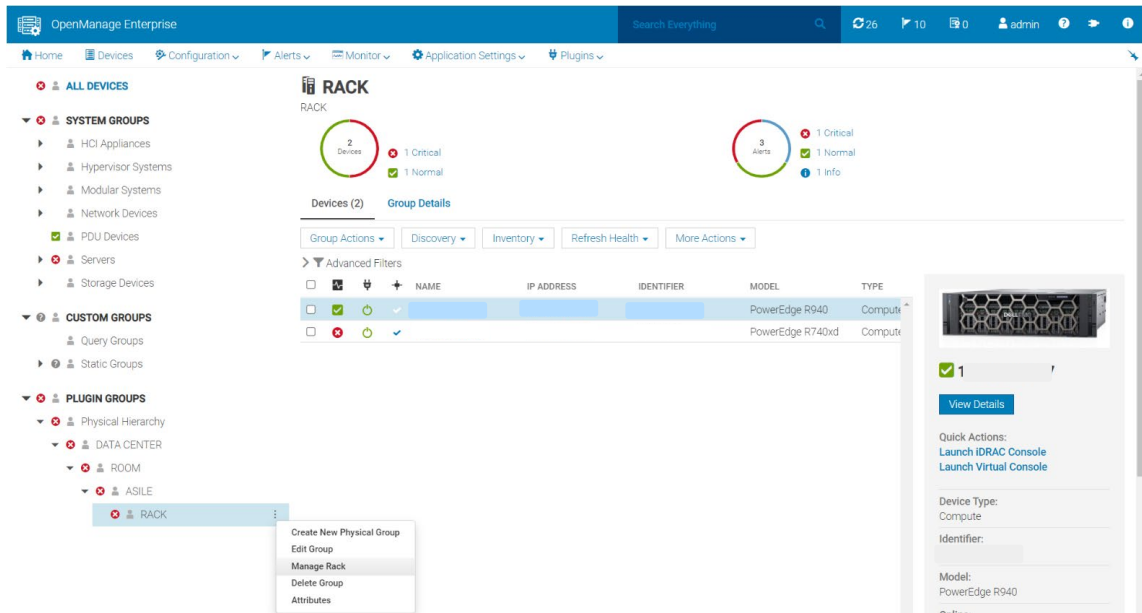

Figure 10   Manage rack physical group

2.   In Manage Rack, go to **Associated Devices** page and click on **Associate to Rack** button.
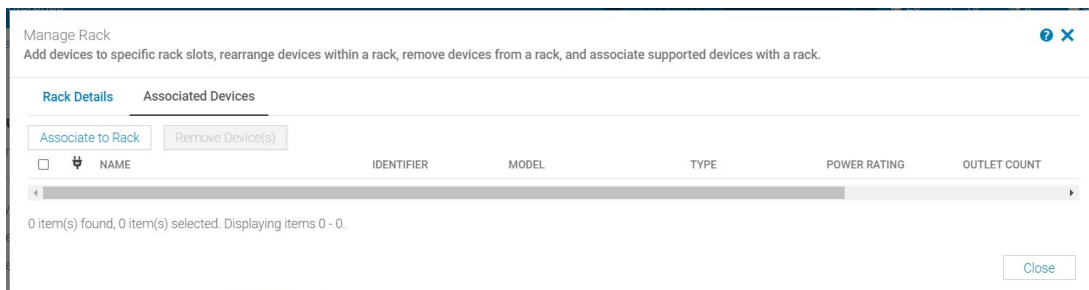

Figure 11   Associate devices to rack

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3. Select the required PDU(s) to be associated to the rack and click **Next**.

Note: When there are many devices, *use Advanced Filters* to make PDU device selection easy by filtering the PDU devices.

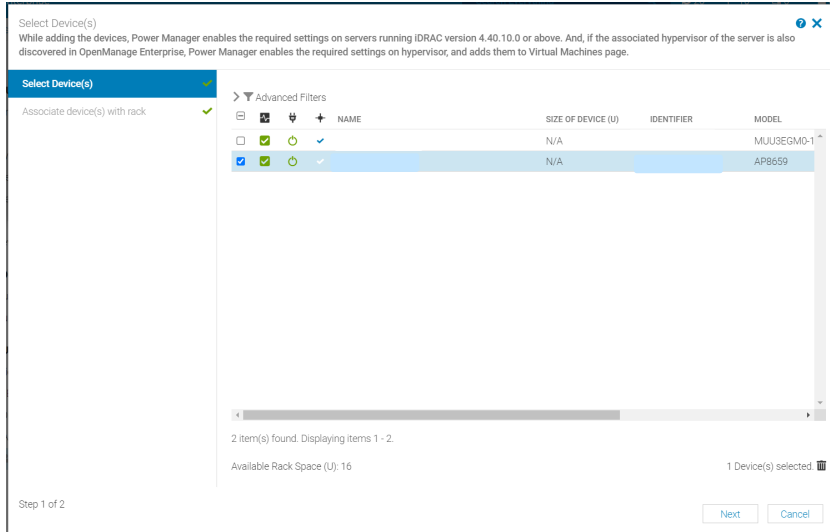Figure 12   Device selection

4. Click **Finish** button. The **Slot** and **Size of Device (U)** are always *N/A* for PDU devices because, PDU devices doesn't occupy any rack slots.
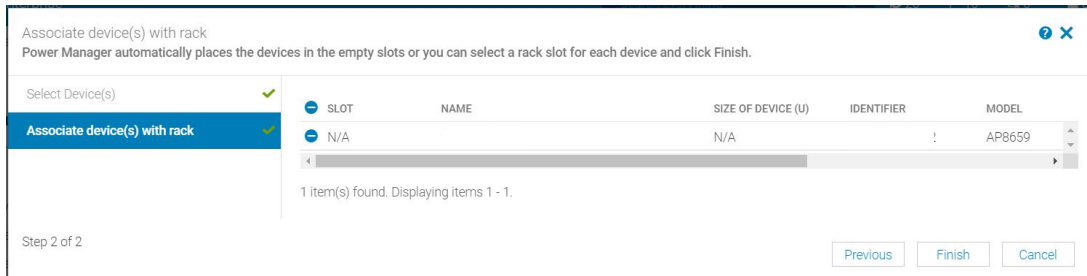

Figure 13   Device selection

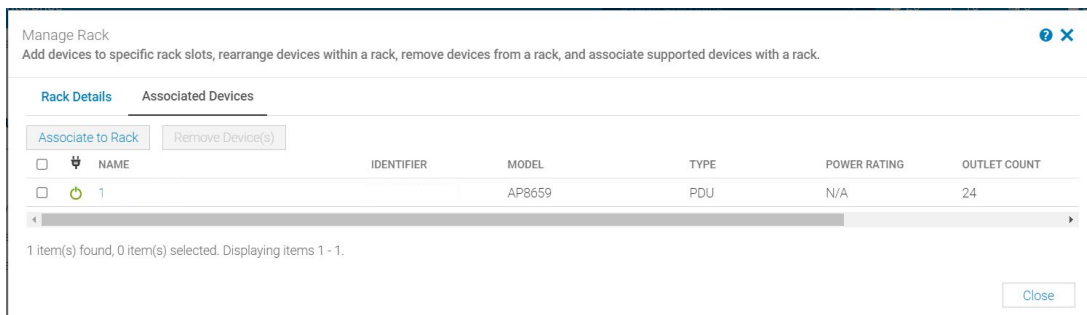5. The PDU is associated to the rack and is shown in **Associated Devices** page.

Figure 14   Associated devices

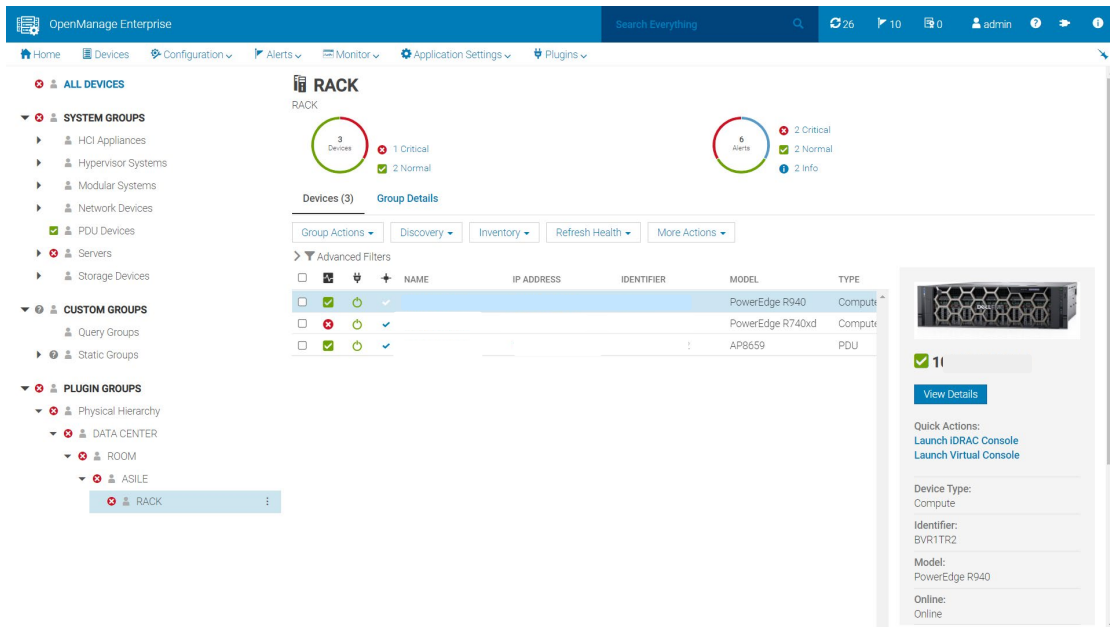6. The associated PDU is now part of the given rack physical group.

Figure 15   Group membership

Note: Multiple PDUs can be associated to a rack, but multiple racks cannot be associated to the same PDU.

2.2   View monitored PDU(s)

This sub-section explains how to view the monitored PDU devices.

1. Launch OpenManage Enterprise, and then click **Plugins > Power Management > Power Manager Devices**. The Power Manager Devices tab is displayed.
2. Click **All Monitored Devices** tab. All the PDU Devices (along with other monitored devices) are listed on the **All Monitored Devices** tab.
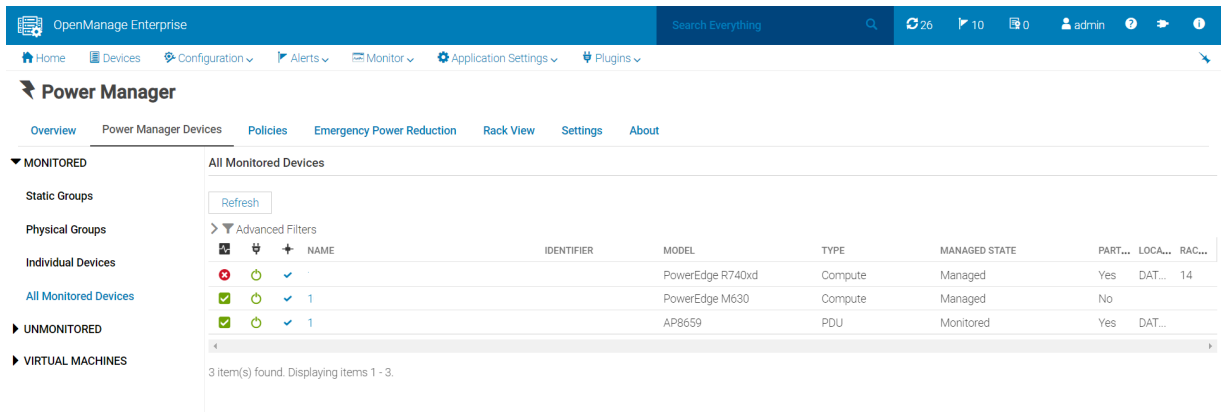

Figure 16   View Monitored PDU

Note: If you are logging in as a Device Manager, only the device groups and devices that are in your scope are available for viewing and management. For example, if you are logging in as a Device Manager DM1 user, you can only view the PDU devices that are part of the group that is assigned to a Device Manager DM1 user.

2.3   View PDU metrics

To view PDU metrics for any rack physical group, go to **Metrics and Monitoring history** page in **Group Details**.
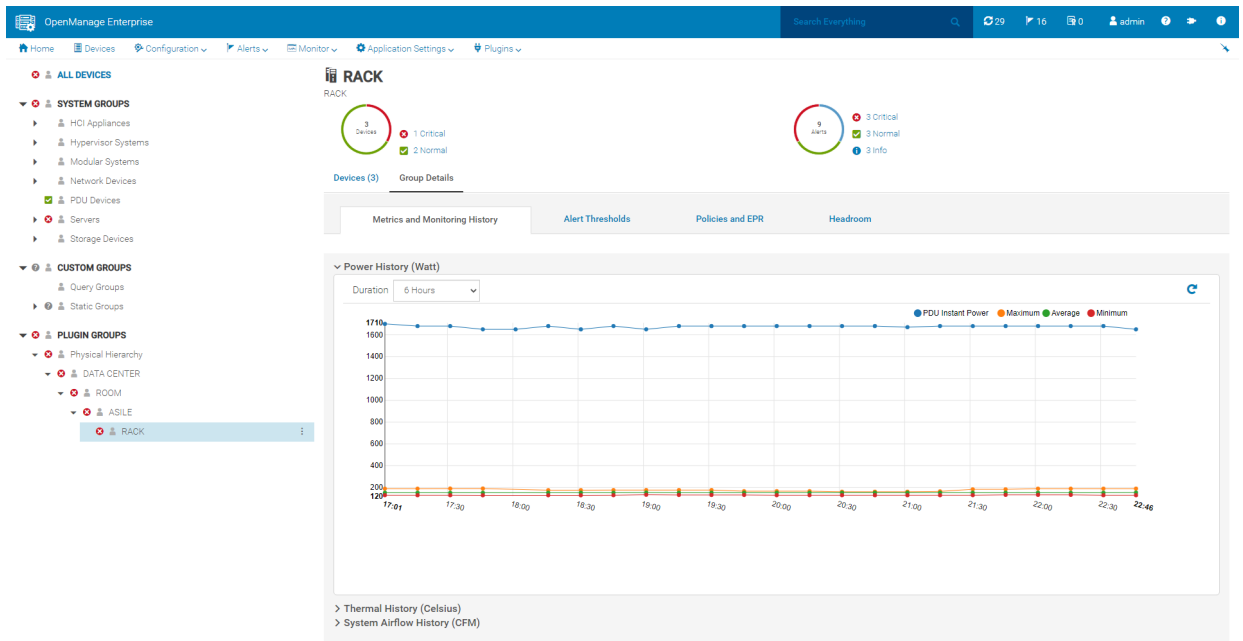

Figure 17   View PDU Metrics

Note: If you are logging in as a Device Manager, only the device groups and devices that are in your scope are available for viewing and management. For example, if you are logging in as a Device Manager DM1 user, you can view all the PDU devices that are part of the group that is assigned to a Device Manager DM1 user.

2.4 Calculation of metrics for physical groups including PDU devices

Following is an example of how the metrics is calculated for physical groups including PDU devices.

Consider the following physical group hierarchy-
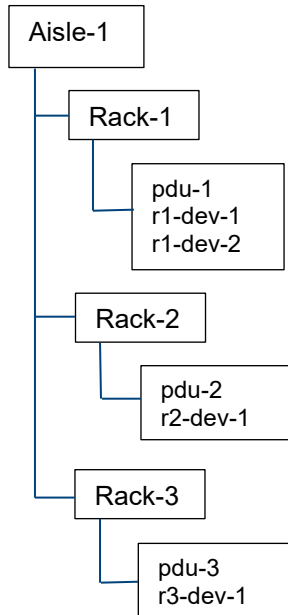

Figure 18   Example physical hierarchy

The graphs in **Metrics and Monitoring History** of *Rack-1* show the following data:

- all the metrics of *pdu-1*
- sum of all the metrics of *r1-dev-1* And *r1-dev-2*

The graphs in **Metrics and Monitoring History** of *Rack-2* show the following data:

- all the metrics of pdu-2
- all the metrics of r2-Dev-1

Graphs in **Metrics and Monitoring History** of *Rack-3* is similar to graphs of *Rack-2*.

The graphs in **Metrics and Monitoring History** of *Aisle-1* show the following data:

- sum of all the metrics of all devices (including PDU devices) in all the three rack groups (such as *Rack-1*, *Rack-2* and *Rack-3*).

3 PDU reports

This section focuses on Power Manager reports which are extended to support the PDU specific information.

3.1 Device overview report

Type: Built-In

Description: This report contains general device information including name, type, model, identifier, and other essential fields.

Advantages: The benefit of this report is that you get a consolidated report of general information of all the devices.

This report is extended to support the PDU devices as well.

The following image is a snippet of the report run:

Figure 19   Device Overview Report

3.2 NIC report

Type: Built-In

Description: This report contains NIC summary information including IP, MAC, etc.

Advantages: The benefit of this Report is user will get a consolidated report of NIC information of all the devices.

This report is extended to support the PDU devices as well.

The following image is a snippet of the report run:

Figure 20   NIC Report

3.3   Power and Thermal Report of Groups

Type: Built-in and custom

Description: This report captures power and thermal data of all groups that are monitored by Power Manager over a certain time period. The groups contain different types of devices as per your preferences.

Advantages: The benefit of this report is that you get a consolidated report of the power and thermal data of all devices being monitored in Power Manager based on the report duration and granularity configured in Power Manager settings. You can further use this consolidated report for statistical analysis for all devices data in a single report.

This report is extended to support the PDU metrics as well.

In this report two new columns have been introduced to display the PDU metrics over a period for a group.

- **Instant Power Metering through PDU(s) (Watt)** – This column displays the instant power consumption by the PDUs for a group.
- **Energy Consumption through PDUs (KWH)** – This column displays the energy consumed by the PDU for a group.

Note: These columns are also introduced in group power and thermal metrics section of custom reports.

The following image is a snippet of the report run:

Figure 21   Power and Thermal Report of Groups

Note: If you are logging in as a Device Manager, only the device groups and devices that are in your scope are available for viewing and management. For example, if you are logging in as a Device Manager DM1 user, and a group G1 is assigned to the Device Manager DM1 user, you can view only those devices which are part of G1 group in these reports.

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4   Conclusion

Using this white paper one can easily discover PDU(s) and monitor the PDU metrics. Also, it helps you understand the benefits of these features.

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5 Technical support and resources

Dell.com/support is focused on meeting customer needs with proven services and support.

5.1 Related resources

- Knowledge Base for Dell EMC OpenManage Enterprise Link.
- Knowledge Base for Dell EMC OpenManage Enterprise Power Manager Link.
- Dell EMC OpenManage Enterprise Power Manager Version 2.0 User's Guide Link.
- Dell EMC OpenManage Enterprise Power Manager RESTful API Guide version 2.0 Link.
- Dell EMC OpenManage Enterprise Power Manager 2.0 Release Notes Link.

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