

Installation Guide for OpenManage Enterprise Power Manager

A quick start whitepaper and checklist to setup OpenManage Enterprise Power Manager

Abstract

This technical whitepaper provides guidance for setting up Power Manager for the first-time with details on how to install it on OpenManage Enterprise and setting up Power Manager to kick start power monitoring and management for a data center.

September 2020

Revisions

Date	Description
September 2020	Initial release with Dell EMC OpenManage Enterprise 3.5 and Power Manager 1.2 versions.

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Terminologies

Acronym	Expansion
CMC	Chassis Management Controller
CPU	Central Processing Unit
EPR	Emergency Power Reduction
GUI	Graphical User Interface
iDRAC	Integrated Dell Remote Access Controller
I/O	Input Output
OME	OpenManage Enterprise
OME-M	OpenManage Enterprise Modular
QRL	Quick Resource Locator
RAM	Random Access Memory
REST	Representational State Transfer
SSB	Small Scale Business
VM	Virtual Machine
PMP	OME Power Manager Plugin
CUPs	Compute Usage per second

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Executive summary

This technical whitepaper provides a guidance for setting up Power Manager by providing details on how to install this plugin on OpenManage Enterprise and the configurations required to kick start Power Manager for power saving in a data center.

The various features covered as part of the whitepaper are as listed below: -

- Installation of plugin
- License requirements
- Adding devices and groups to Power Manager
- View and analyze metric data
- Setting power and temperature threshold
- Policies
- EPR
- Reading reports
- Configuring dashboard

1 Introduction

Power Manager is designed to support a data center administrator by providing functionalities to monitor the power, thermal and various other metrics consumption trends for servers and chassis which are part of the data center.

This whitepaper provides a guidance on how to set up the appliance starting from installation, to collect and manage data and view data in a concise way. This guide provides a step-by-step method to configure the plugin in-order to start using all the functionalities that Power Manager has to offer.

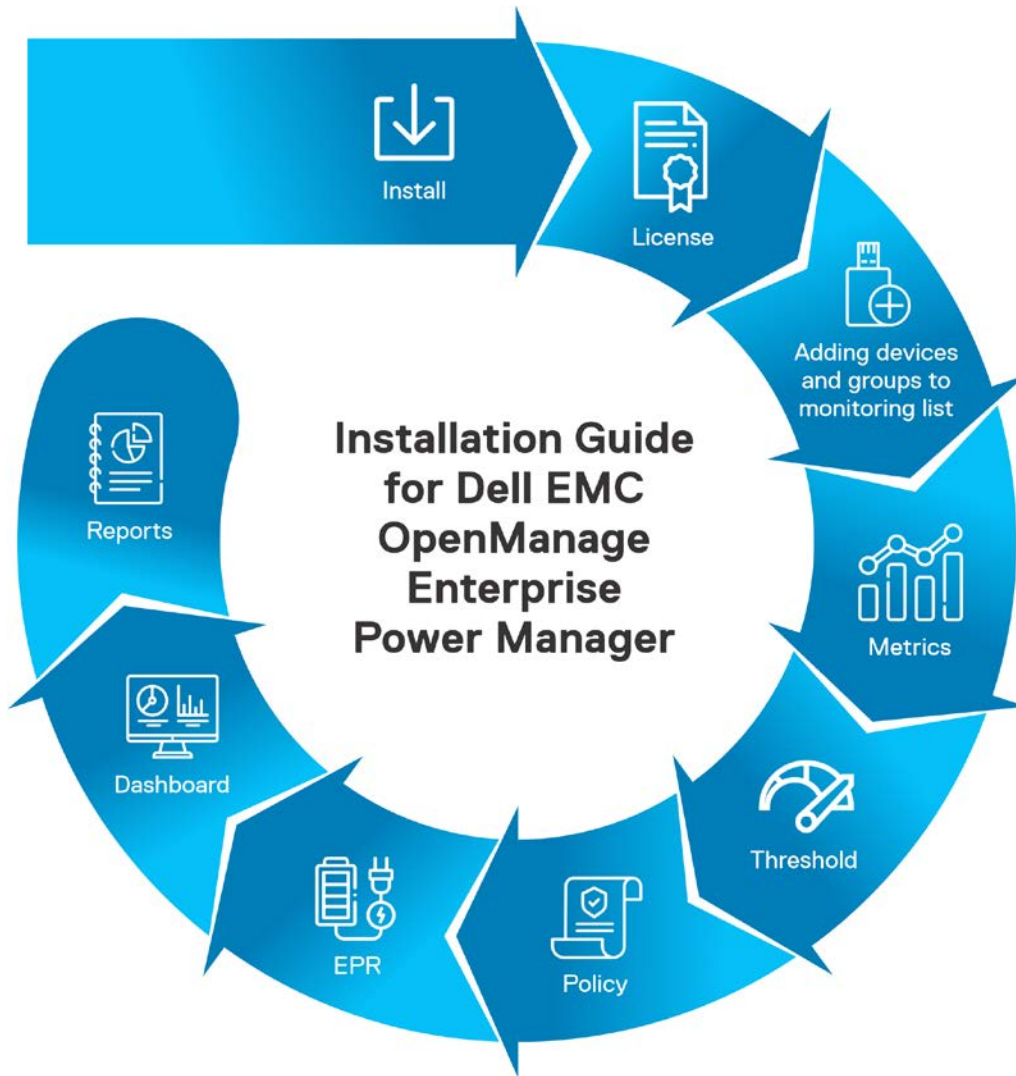


Figure 1 Introduction to installation guide.

2 Installation of Plugin

This section highlights the beginning of usage of the plugin. There are 2 major ways of installing the Power Manager Plugin – the online and the offline installation methods.

2.1 Online Installation

This method is provisioned for customers having internet connectivity and no firewall restrictions on connecting to the internet.

Check the following pre-requirements for installing Power Manager:

- Check for active internet connection.
- Ensure that downloads.dell.com is reachable from the network in which OpenManage Enterprise appliance is hosted.
- Following configurations are required on OpenManage Enterprise appliance:
 - Application Settings → Consoles and Extensions → Update Settings.
 - Where to Check for updates → dell.com → Apply

Update Settings ? X

How to check for updates Automatic Manual

Where to check for updates dell.com ? Network Share

Automatically start the console update when downloads are complete.

Figure 2 Selecting Online Install Path

Once the above setting has been configured, you should see the plugin available for Installation. Proceed for installation of the plugin.

Note: If you are using OpenManage Enterprise version 3.5, the Consoles and Extensions tab is renamed to Consoles and Plugins and the Power Management tab is moved under Plugins tab of the OpenManage Enterprise console.

Note: In case of a multi-homed appliance, whose primary interface is connected to a private network, ensure that the proxy is enabled along with internet connection. For more information about the procedure, see [Open Manage Enterprise User's Guide](#).

2.2 Offline Installation

This method is provisioned for customers who either have a stringent firewall in place or work completely in a dark-site and have no active connectivity to the internet.

Offline method of installation requires the customer to have the plugin files downloaded and maintained in an offline share.

OpenManage Enterprise supports NFS/HTTPS/HTTP share types for offline installation of the plugin.

Prerequisite:

Ensure that the folder structure is maintained as indicated in the below image:

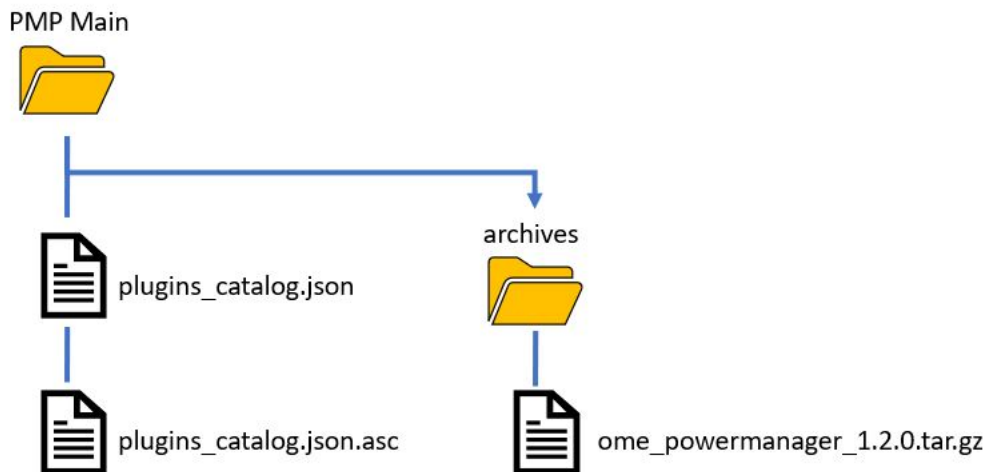


Figure 3 Folder structure for offline installation

The steps to set up the folder as follows:

1. Download the plugin zip file from Dell support site
2. Extract and save the files in the share directly for use.

Note: Ensure that you retain the same folder structure.

To download the zip version of Power Manager 1.2 click the [link to dell support site](#).

(Optional if not using the above method)

1. Create a folder with an appropriate name
2. Download and save the following files in the created folder:
 - a. plugins_catalog.json,
 - b. plugins_catalog.json.asc
3. In the same folder, create another folder named **archives** and download the **ome_powermanager_1.2.0.tar.gz** file in this folder.
Setting up the share folder is completed.

4. To check for a successful connection, after configuring the **Update Settings** section for offline updates in OpenManage Enterprise, click **Application Settings → Console and Plugins → Update Settings → Test Connection**.

Following are the configurations required in OpenManage Enterprise appliance.

- Application Settings → Consoles and Extensions → Update Settings.
- To check for updates → Network Share → Local Path
- Provide the Local Path in the formats mentioned below:
 - NFS: nfs://IP Address/Folder_Name
 - HTTP: http://IP Address/Folder_Name
 - HTTPS: https://IP Address/Folder_Name

Update Settings

How to check for updates Automatic Manual

Where to check for updates dell.com Network Share ⓘ

Local Path

Test Connection Connection Successful [Test again](#)

Automatically start the console update when downloads are complete.

Apply Cancel

Figure 4 Setting offline http install path

After the above setting is configured, you can see the plugin is available for installation on the **Console and Plugins** page.

Proceed with installation of the plugin.

3 License Requirements

After the plugin is installed, the next step is to import the licenses on devices to make them Power Manager capable devices. The metric collection for the devices begins after adding them to Power Manager (Monitoring List). If the license is already imported, perform a re-inventory of the system to find capable devices for power monitoring and management in Power Manager.

This section details the license and device capability requirements for managing and monitoring of devices.

3.1 License details for various devices

The table below highlights the license details for various supported device types:

Table 1 License capability for servers

License Available on device					Power Manager Plugin capability	
OME Advanced license	iDRAC Base license	iDRAC Express license	iDRAC Enterprise License	iDRAC Data Center license	Device and group monitoring	Device and group management
No	Yes	No	No	No	Not Allowed	Not Allowed
No	No	Yes	No	No	Not Allowed	Not Allowed
No	No	No	Yes	No	Not Allowed	Not Allowed
No	No	No	No	Yes	Not Allowed	Not Allowed
Yes	Yes	No	No	No	Not Allowed	Not Allowed
Yes	No	Yes	No	No	Allowed	Not Allowed
Yes	No	No	Yes	No	Allowed	Allowed
Yes	No	No	No	Yes	Allowed	Allowed

Table 2 License capability with chassis

License available on Chassis		Power Manager Plugin Capability		
Chassis models	CMC Enterprise license	Monitoring	Power Policy	EPR Throttle
PowerEdge VRTX	No	Yes	No	Yes
PowerEdge VRTX	Yes	Yes	Yes	Yes
PowerEdge FX2 or PowerEdge FX2s	No	Yes	No	Yes
PowerEdge FX2 or PowerEdge FX2s	Yes	Yes	Yes	Yes
PowerEdge M1000e	NA	Yes	Yes	Yes
PowerEdge MX7000	NA	Yes	Yes	Yes

4 Adding Devices and Groups to Monitoring List

This section provides recommendation about leveraging the custom Static Group feature of OpenManage Enterprise for creation of groups for better power management of devices. This section additionally calls out method for addition of device and groups to the Monitoring List of Power Manager.

Few use cases are listed below to provide various options related to licensing and addition of devices and groups to Monitoring List.

4.1 Device Discovery Before and After Installation of the Plugin

The behavior of addition of devices to Power Manager are in accordance with when the device was discovered in OpenManage Enterprise.

- **If the device is discovered after plugin installation**—the license capabilities are identified by the plugin during inventory cycle and you can add the device directly to the Monitoring List if it meets the required capabilities.
- **If the device is discovered before plugin installation**—the plugin is unable to identify the capabilities of the device. Hence, re-run the inventory on the device to fetch the device capabilities. After clicking **Refresh the list for Power Manager capabilities** option, the device is listed for addition to the monitoring list.

After the capabilities are identified, the devices are listed for addition in Power Manager. Following is the method to add these devices to the Monitoring List:

- In OpenManage Enterprise, click Power Management→Monitored Devices and Groups→Individual Devices
- Select the devices under **Add Devices to Power Manager** section
- Click Add Selected.

Devices added to the Monitoring List are displayed under **All Monitored Devices** tab and, the metric collection for these devices begin in the background.

4.2 Leveraging the Device Statistics Dashboard

The dashboard section on the Home page of OpenManage Enterprise has a section for **Power Manager** after the plugin is installed. The **Device Statistics** tab under this section displays the count of Capable Devices and Monitored Devices on a mouse hover.

- **Capable Devices**—this graph displays the count of devices that are capable of addition to Monitoring List out of the total number of discovered devices in OpenManage Enterprise. For the second case called out in the above section, once the capabilities are refreshed, the count for Capable Devices is updated to add up the count of the newly identified capable devices.
- **Monitored Devices**—this graph displays the count of devices that are being monitored by Power Manager.

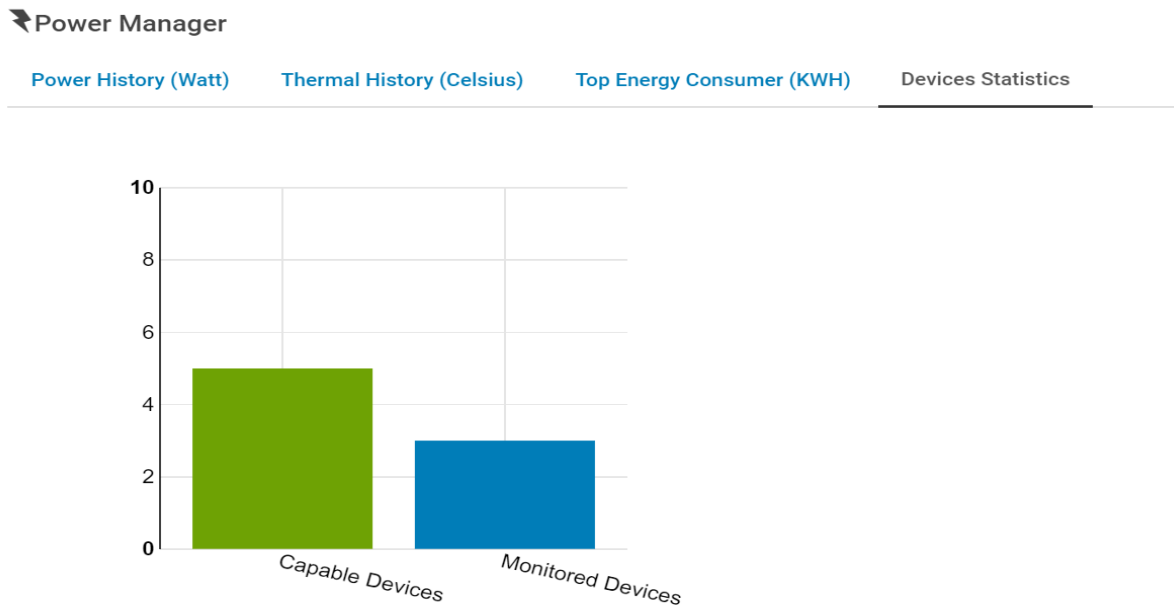


Figure 5 Device Statistics of Capable and Monitored Devices

4.3 Adding Groups to Monitoring List

Power Manager leverages the custom Static Group creation capability of OpenManage Enterprise in order to create the groups.

Following are some of the use cases for this feature:

- **Addition of empty group to Monitoring List**—you can add empty groups to the Monitoring List. This feature helps you to have the structure of groups ready and add the devices to the Monitoring List. After adding the devices to the Group, the devices are listed in the monitoring list under **All Monitored Devices** tab.
- **Creation of group and then addition to the Monitoring List**—one of the strategies to provide data for corrective actions to save power is to group the devices as per their rack structure (replicating their locations in a data center). After adding this group to the monitoring list, leverage the cumulative metric data to decide on the corrective actions.

For Static Groups, after the group is created, following is the method to add these groups to the Monitoring List:

1. In OpenManage Enterprise, click Power Management → Monitored Devices and Groups → Static Groups → Add Group(s)
 2. Select the groups in Add Groups to Power Manager and click Add Selected.
- Capable devices that are part of the group are automatically added to the Monitoring List and are listed in **All Monitored Devices** tab and, the metric collection for these devices begin in the background.
 - The Static Groups added to Power Manager are listed under the **Static Groups** tab and the metric aggregation for these groups begin in the background.

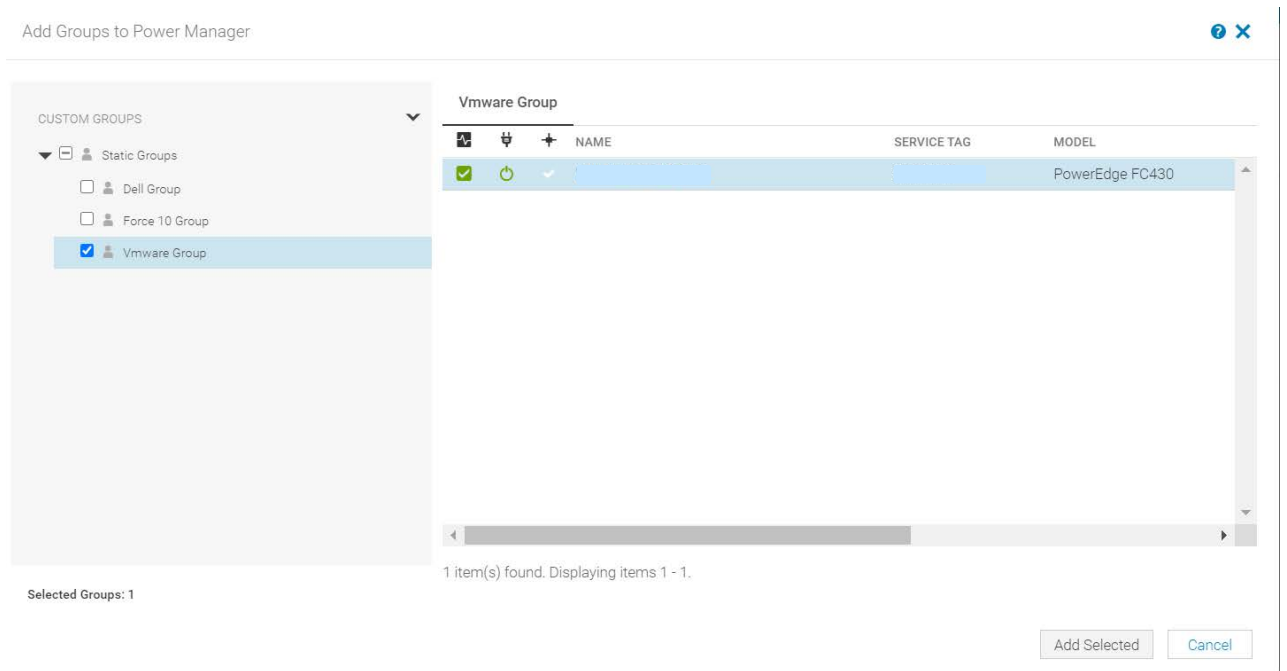
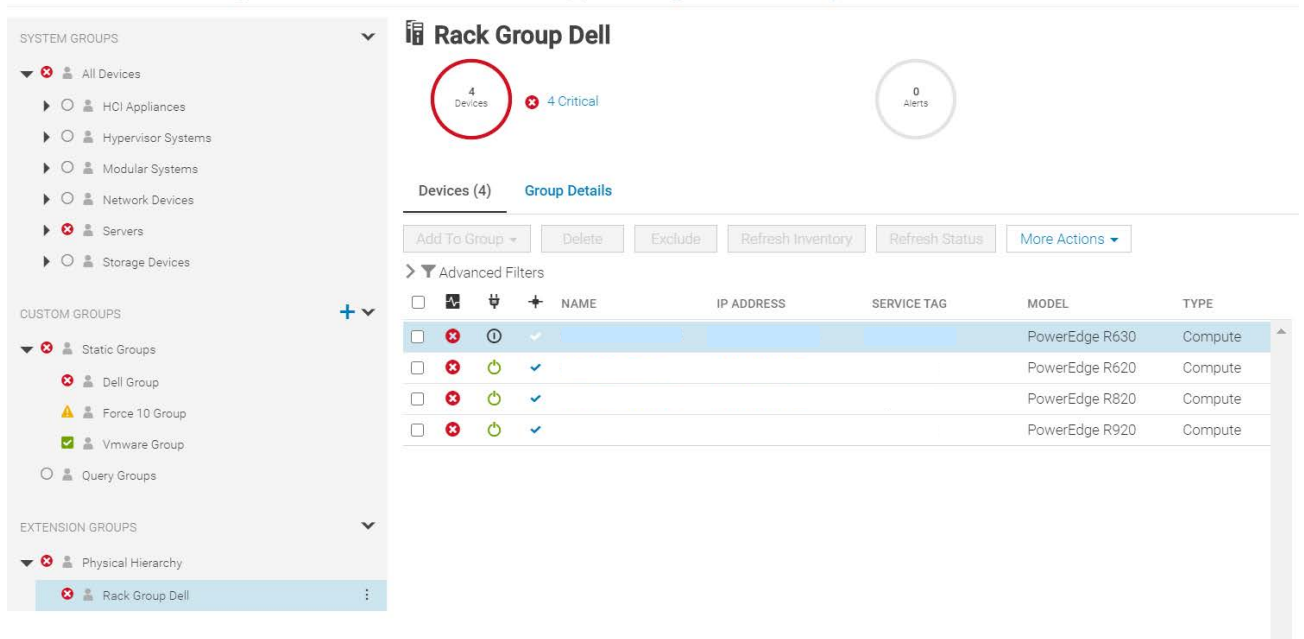


Figure 6 Adding a Static Group to the Monitoring List

- Addition of Physical Groups to Monitoring List—Power Manager automatically adds any Physical Group created in OpenManage Enterprise, into the Monitoring list along with all its constituent Power Manager Monitoring Capable devices.
 - There is no option to add or remove Physical Groups manually. To not monitor a physical group in Power Manager, delete the Physical Group.
 - You can create Physical Groups for all hierarchy levels such as Data Centre, Room, Aisle and a Rack.
 - Addition of devices is allowed directly only in the Rack Group.
 - The metrics collected for the devices under the Rack groups are aggregated from the bottom group level (Rack) to the highest group level (Data center) in the physical group.

Adding Devices and Groups to Monitoring List

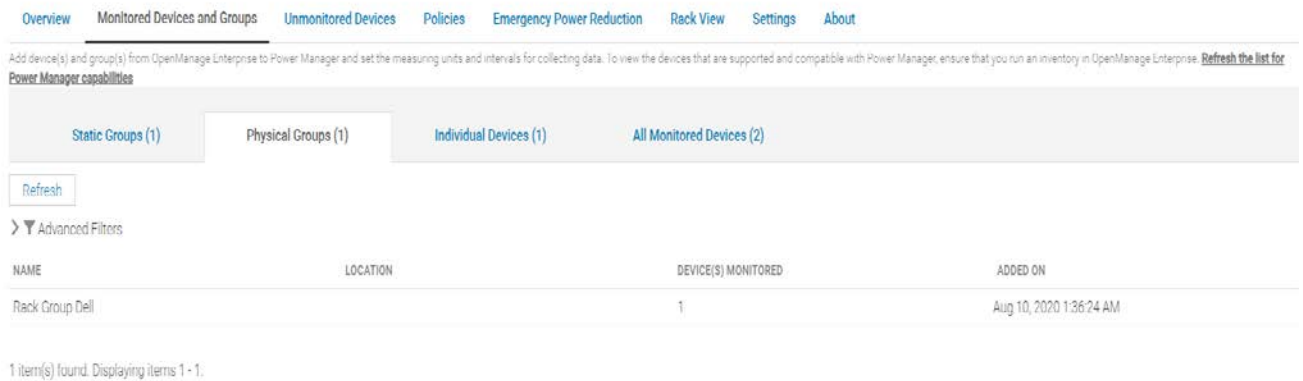


The screenshot shows the 'Rack Group Dell' interface in OpenManage Enterprise. On the left, there is a navigation pane with three categories: SYSTEM GROUPS, CUSTOM GROUPS, and EXTENSION GROUPS. Under SYSTEM GROUPS, 'All Devices' is expanded to show 'Servers' with a red 'x' icon. Under CUSTOM GROUPS, 'Static Groups' is expanded to show 'Dell Group' with a red 'x' icon. Under EXTENSION GROUPS, 'Physical Hierarchy' is expanded to show 'Rack Group Dell' with a red 'x' icon. The main content area is titled 'Rack Group Dell' and shows '4 Devices' (circled in red) and '4 Critical' alerts (circled in red). Below this, there are buttons for 'Add To Group', 'Delete', 'Exclude', 'Refresh Inventory', 'Refresh Status', and 'More Actions'. An 'Advanced Filters' section is visible, followed by a table of devices:

	NAME	IP ADDRESS	SERVICE TAG	MODEL	TYPE
<input type="checkbox"/>				PowerEdge R630	Compute
<input type="checkbox"/>				PowerEdge R620	Compute
<input type="checkbox"/>				PowerEdge R820	Compute
<input type="checkbox"/>				PowerEdge R920	Compute

Figure 7 Physical Groups in OpenManage Enterprise

Power Management



The screenshot shows the 'Power Management' interface. The top navigation bar includes 'Overview', 'Monitored Devices and Groups', 'Unmonitored Devices', 'Policies', 'Emergency Power Reduction', 'Rack View', 'Settings', and 'About'. Below the navigation bar, there is a message: 'Add device(s) and group(s) from OpenManage Enterprise to Power Manager and set the measuring units and intervals for collecting data. To view the devices that are supported and compatible with Power Manager, ensure that you run an inventory in OpenManage Enterprise. [Refresh the list for Power Manager capabilities](#)'. Below this message, there are four tabs: 'Static Groups (1)', 'Physical Groups (1)', 'Individual Devices (1)', and 'All Monitored Devices (2)'. A 'Refresh' button is located below the tabs. An 'Advanced Filters' section is visible, followed by a table of monitored devices:

NAME	LOCATION	DEVICE(S) MONITORED	ADDED ON
Rack Group Dell		1	Aug 10, 2020 1:36:24 AM

1 item(s) found. Displaying items 1 - 1.

Figure 8 Physical Group automatically added to Power Manager's monitoring list

5 View and Analyze Metric Data

After the devices are added to the Monitoring List, the background task of collecting the metric data for various devices and aggregation of this data for the groups begin.

This section highlights the way one can read and analyze the metric data.

5.1 Metric Data for Devices

View metric data for devices by navigating to **All Devices** page of Open Manage Enterprise.

Following are the steps to view the metrics for a device added to the Monitoring List:

1. Click the name of a device. The device details are displayed.
2. Click Power Management and Monitoring → Metrics and Monitoring History

This section displayed the graphs for various metrics collected for the device.

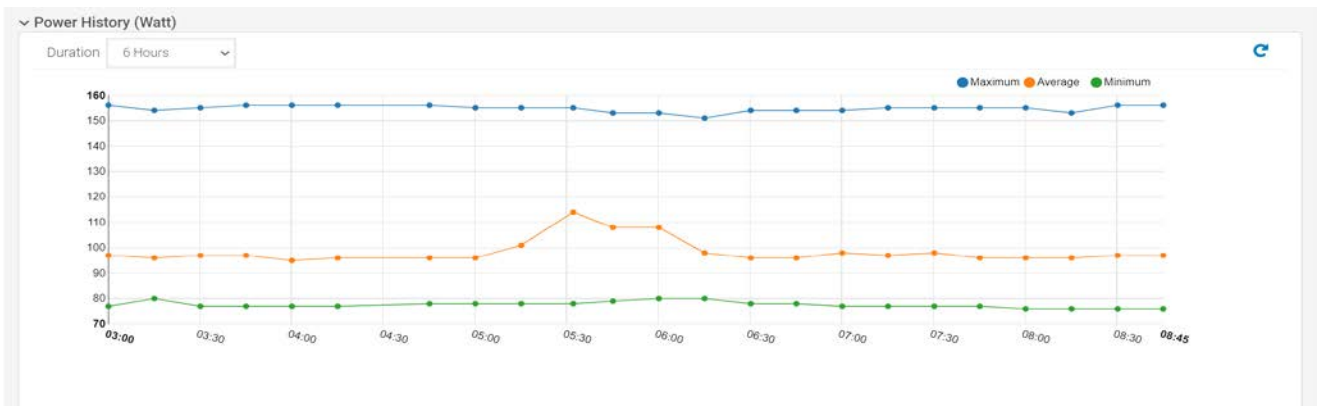


Figure 9 Power History Graph for a device

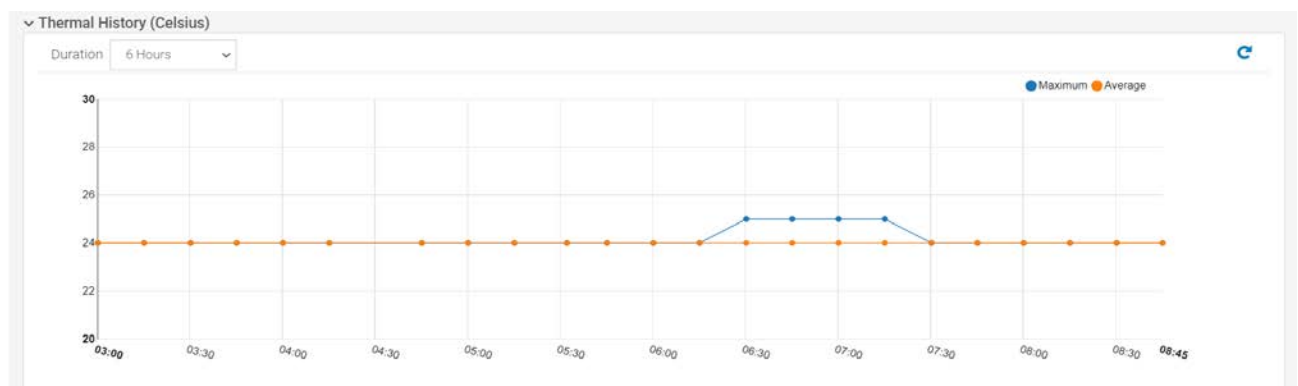


Figure 10 Thermal History Graph for a device

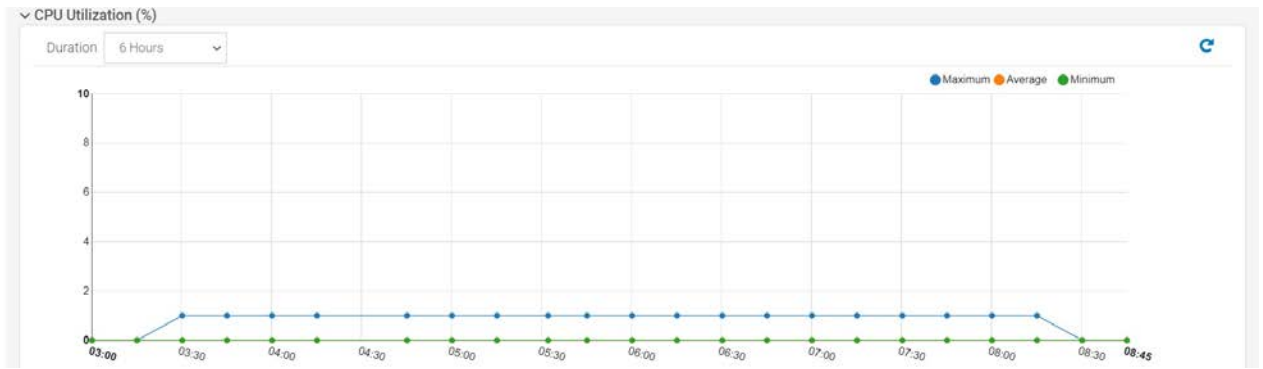


Figure 11 CPU Utilization Graph for a Device

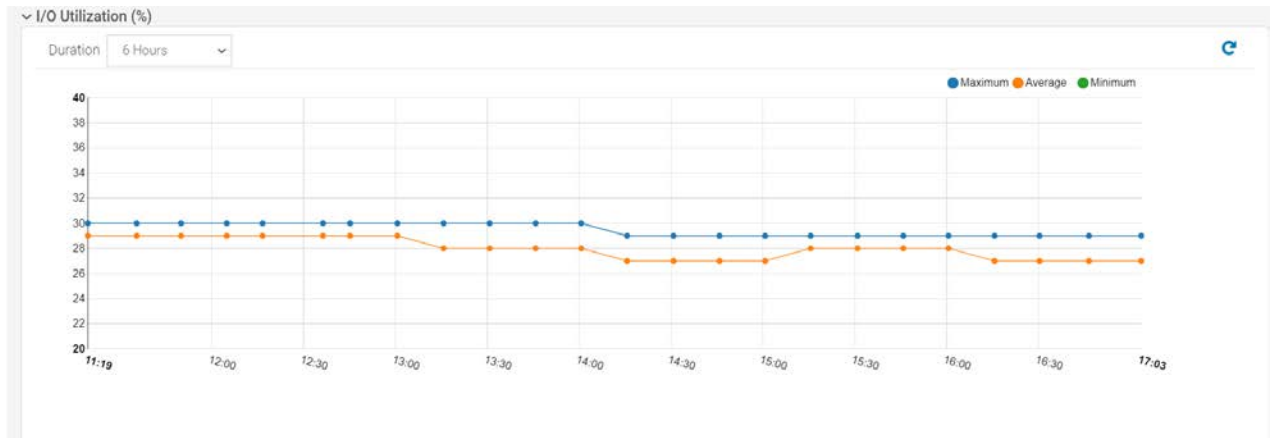


Figure 12 Fig xx: I/O Utilization for a Device

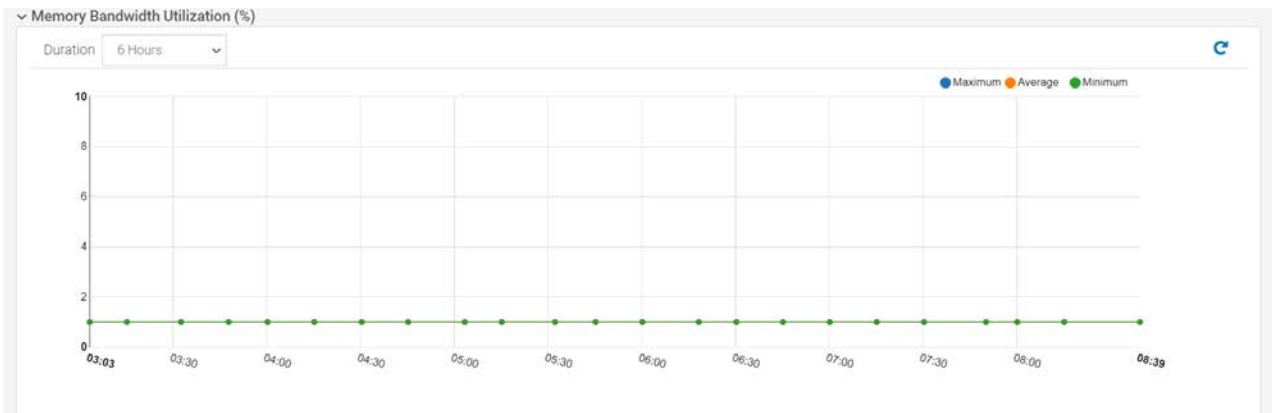


Figure 13 Memory Bandwidth Utilization Graph for a device

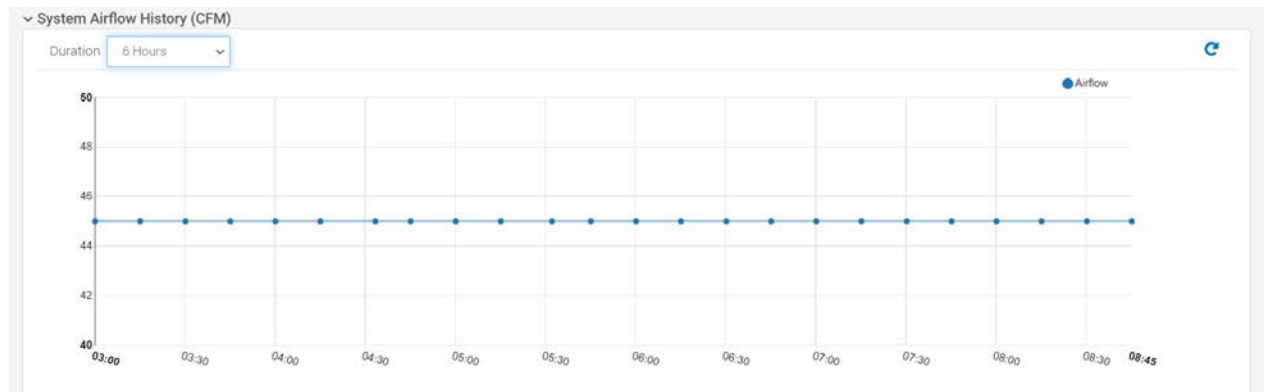


Figure 14 System Airflow data for a device

5.2 Metric Data for Groups

View metric data for groups by navigating to **All Devices** page of Open Manage Enterprise.

Following are the steps to view the metrics for a group added to the Monitoring List:

- In OpenManage Enterprise, click a group name → Group Details → Metrics and Monitoring History

This section lists the Power History, Thermal History and System Airflow History graphs (if constituent devices provide this data).

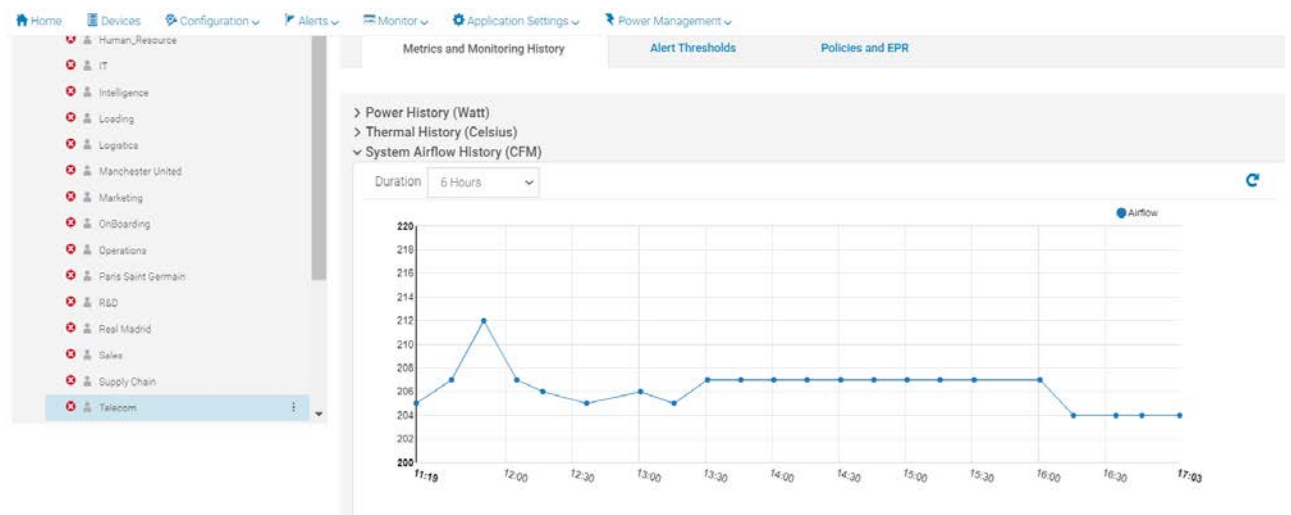


Figure 15 System Airflow Graph for a group

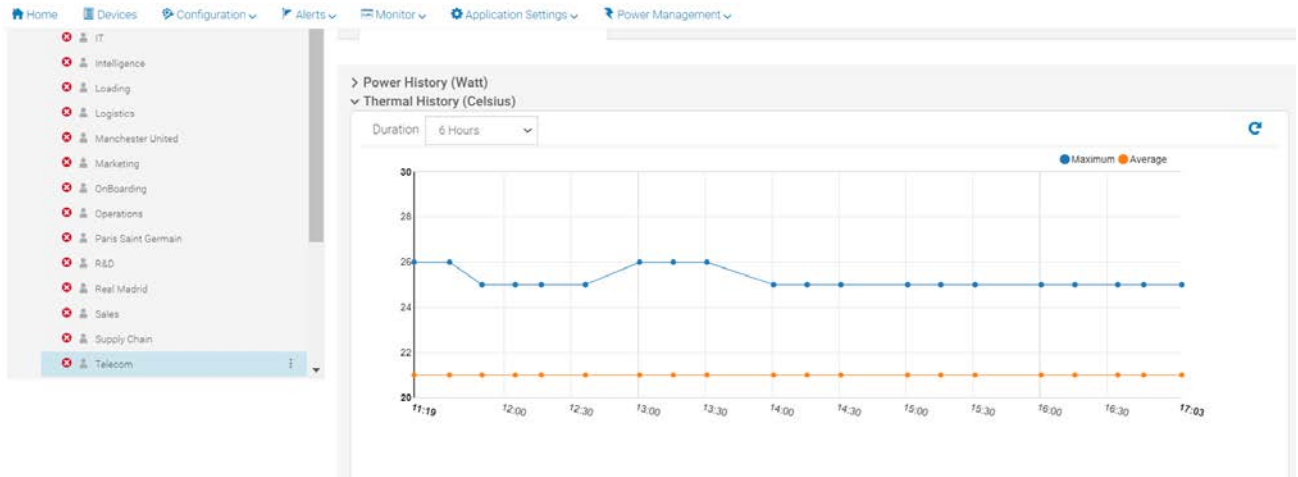


Figure 16 Thermal History Graph for a group

5.3 Analyzing data using Metric Graphs

The metric graphs shown for devices and groups added to Monitoring List are a convenient way to identify any outliers. Using the graph and the duration options (6 Hours, 12 Hours, 1 Day, 7 Days, 1 Month, 3 Months, 6 Months and 1 Year) you can identify any sudden spikes in the consumption that might have occurred recently or in the past.

For example, in the graph shown below, you can identify that the consumption of this device is increased over the last 2 days and further corrective actions can be taken based on these values.

This analysis provides a Data Center Administrator an assistance with finding the optimum operating resource consumption for their servers for power, temperature and other utilizations considering the system load.

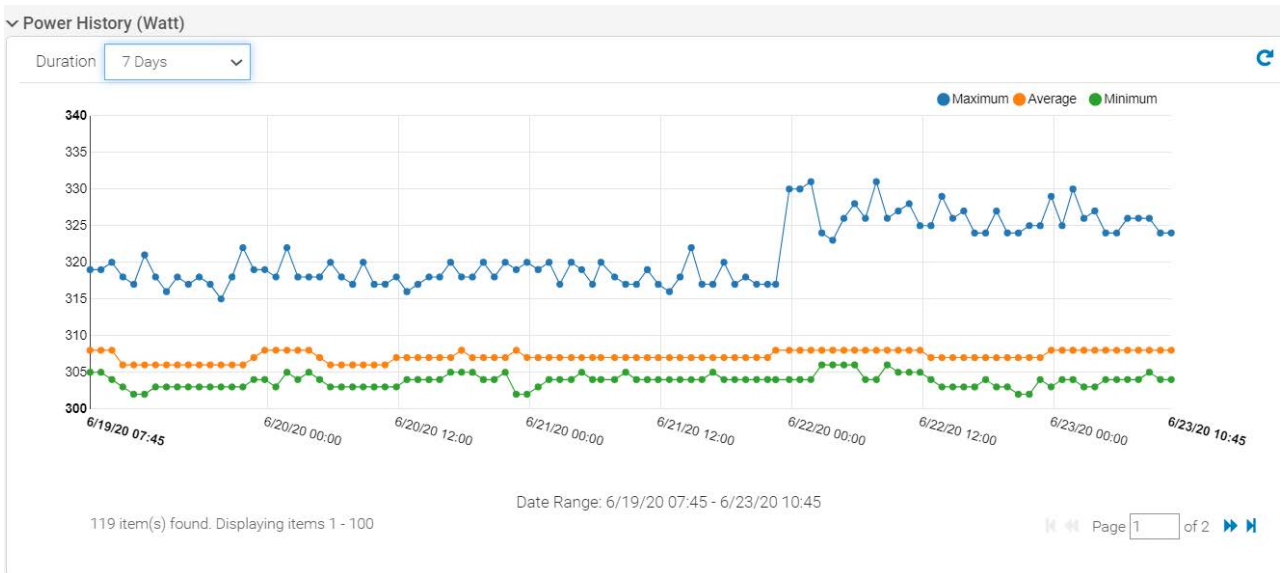


Figure 17 Metric Data for 7 days duration for a device

6 Setting Power and Temperature Threshold

Another step in the checklist of setting up the plugin is to create Power and Temperature Thresholds for devices and groups.

Thresholds provide a set of boundary conditions in order to generate events for immediate attention of a Data Center Administrator to investigate the problem. This feature provides assistance to a Data Center Administrator to maintain the Power and Temperature values for devices and groups within a pre-determined optimum range.

This section summarizes the method to set thresholds for devices and groups.

6.1 Setting Thresholds

To set the threshold values for groups and devices, perform the following steps:

Prerequisites:

- Determine the optimum Upper Warning and Upper Critical values for Power Threshold and Lower Critical, Lower Warning, Upper Warning and Upper Critical values for Temperature Thresholds.
- For a group, ensure that these values are a summation of the thresholds identified for individual devices part of the group.

To set the threshold for a device:

1. Click the name of a device. The device details are displayed on the **Overview** tab.
2. Click Power Management and Monitoring→Alert Thresholds.
3. Click the Edit option and provide the values.
4. Click Apply.

To set the threshold value for a group:

1. Click the name of a group.
2. Click Group Details→Alert Thresholds.
3. Click the Edit option and provide the values.
4. Click Apply.

Edit Alert Thresholds: Banking ? X

Configure the threshold values to generate alerts when the current system values exceed the specified threshold values.

Power (Watt)

Upper warning

Upper critical

Temperature (Celsius)

Lower critical

Lower warning

Upper warning

Upper critical

Figure 18 Setting threshold on a Group

6.2 Event Generation

Whenever any of the threshold values are violated, an alert is generated.

View the alerts from OpenManage Enterprise page, Alerts → Alert Log, under the **System Health** Category and **Metrics** Sub-Category.

The violations of thresholds are also captured in the **Audit Logs** and on the dashboard of OpenManage Enterprise **Home Page** Under **Recent Alerts** section if the alerts are generated recently.

Recent Alerts

▲ **Metrics**

Temperature on Banking has exceeded its lower threshold.

Aug 10, 2020 5:25:49 PM

✖ **Metrics**

Power on Banking has exceeded its threshold.

Aug 10, 2020 5:25:49 PM

Figure 19 Alerts under OpenManage Enterprise Home Page Recent Alerts Section

Alerts

Alert Log Alert Policies Alert Definitions

Acknowledge Unacknowledge Ignore Export Delete Archived Alerts

Advanced Filters Clear All Filters

Severity: All Acknowledge: Unacknowledged Start Date: End Date: Source Name: Category: All Subcategory: All Message:

SEVERITY	ACKNOWLEDGE	TIME	SOURCE NAME	CATEGORY	SUBCATEGORY	MESSAGE ID	MESSAGE
Warning	[]	Aug 10, 2020 5:25:49 ...	Banking	System Health	Metrics	CMET0004	Temperature on Banking has exceeded its lower thresh...
Error	[]	Aug 10, 2020 5:25:49 ...	Banking	System Health	Metrics	CMET0008	Power on Banking has exceeded its threshold.

Figure 20 Alerts inside OpenManage Enterprise Alerts Log Section

Audit Logs Jobs Discovery Server Initiated Discovery Inventory Warranty Reports MIB

Export


Advanced Filters

SEVERITY	TIME STAMP	USER	MESSAGE ID	SOURCE ADDRESS	CATEGORY	DESCRIPTION
Info	Aug 10, 2020 5:30:...	Internal_Process	CJOB5002	Internal	Configuration	The task with the following details is completed. Job Name: WorkingSet_Ma...
Info	Aug 10, 2020 5:30:...	Internal_Process	CPWR0030	Internal	Configuration	The group(s) are successfully added in the Power Monitoring list.
Info	Aug 10, 2020 5:30:...	Internal_Process	CPWR0030	Internal	Configuration	The group(s) are successfully added in the Power Monitoring list.
Info	Aug 10, 2020 5:30:...	Internal_Process	CJOB5001	Internal	Configuration	The task with the following details is started. Job Name: WorkingSet_Manag...
Warning	Aug 10, 2020 5:25:...	admin	CMET0004		System Heal...	The Temperature on Banking has exceeded its lower threshold value.
Error	Aug 10, 2020 5:25:...	admin	CMET0008		System Heal...	The Power on Banking has exceeded its threshold value.
Info	Aug 10, 2020 5:25:...	admin	CMET0005		Configuration	The threshold value of Banking is successfully configured for Temperature .
Info	Aug 10, 2020 5:25:...	admin	CMET0005		Configuration	The threshold value of Banking is successfully configured for Power .
Info	Aug 10, 2020 5:08:...	admin	CUSR0001		Audit	Successfully logged in from GUI .
Info	Aug 10, 2020 11:3:...	System	CAPP0178		Configuration	Console setting CIFS share Password changed modified.

Figure 21 Audit Logs for Threshold Alerts along with their severity of violation

Top Offenders list for threshold violators in Groups and Devices—the devices or groups that generate alerts in a large number are added to the **Top Offenders** under the **Overview** page in Power Manager. The top 10 violators of threshold for both devices and groups based on Temperature or Power threshold violations are added here.


Top 10 Power Offenders

Entity Type State 

ENTITY NAME	SERVICE TAG	TOTAL VIOLATIONS	THRESHOLD STATE
		1	Warning

1 item(s) found. Displaying items 1 - 1.

Top 10 Temperature Offenders

Entity Type State 

ENTITY NAME	SERVICE TAG	TOTAL VIOLATIONS	THRESHOLD STATE
cmc-81jj5bs.bdcsv.lab		1	Critical
MINWINPC		1	Critical

2 item(s) found. Displaying items 1 - 2.

Figure 22 Devices in Top 10 Offenders List

7 Setting Static and Temperature-Triggered Policy

The Static and Temperature-Triggered policy feature of Power Manager provides you with management capability where you can impose certain power restrictions and apply Emergency Power Restrictions (EPR) when the configured events arise.

This section of the whitepaper highlights the method for applying power and temperature-triggered policies for devices and groups to leverage the management capability of the plugin.

7.1 Static Policy

Static policy is related to power and is a method provided to cap the power consumption of a device or a group. Whenever this policy is in active state the configured Power Cap value gets applied on the integrated Dell Remote Access Controller (iDRAC), Chassis Management Controller (CMC) or the OpenManage Enterprise Modular (for MX7000) devices and henceforth the device maintains the power consumption to this set value.

Note: If multiple policies are applied on a device, the most restrictive policy is activated.

- Configuring Static policy on a device:
 1. In OpenManage Enterprise, click Power Management → Policies → Create.
 2. In the policy creation wizard, select Type of policy as **Static**, provide a name and description for the policy, and click **Next**.
 3. Select a device and click **Next**.
 4. Set a Policy Cap value and click **Next**.
 5. Select a policy schedule and click **Next**.
In case of scheduled policy, the policy is applied on the device only for the selected duration.
 6. Review the policy details and click **Finish**.

- Configuring Static policy on a group:
 1. In OpenManage Enterprise, click Power Management → Policies → Create.
 2. In the policy creation wizard, select Type of policy as Static, provide a name and description for the policy, and click **Next**.
 3. Select a group added in Power Manager and click **Next**.
 4. Set a Policy Cap value and click **Next**.
 5. Provide a policy schedule and click **Next**.
In case of a scheduled policy, the policy is applied on the devices part of the group only for the selected duration.
 6. Review the policy details and click **Finish**.

7.2 Temperature-Triggered Policy

Temperature-Triggered policy is related to the temperature of the whole group and is a method to throttle down the power consumption of the devices part of this group. This policy gets activated only when the average inlet temperature of the group crosses the applied Temperature Cap value.

Note: Temperature-Triggered policy is applicable only to groups and you cannot schedule a temperature-triggered policy.

- Configuring Temperature-Triggered policy:
 1. In OpenManage Enterprise, click Power Management → Policies → Create.
 2. In the policy creation wizard, choose the policy type as Temperature-Triggered, provide a name and description for the policy and click **Next**.
 3. Select a group and click **Next**.
 4. Set the temperature value and click **Next**.
 5. Review the policy details and click **Finish**.

Note: For troubleshooting with respect to policies on devices and groups refer the [Whitepaper on Static Power and Temperature-Triggered Policies](#).

8 EPR

The EPR feature helps reduce power consumption of devices immediately during a power emergency. These sudden power failures can cause a partial or complete center cessation and lead to major losses. In order to avoid these losses a Data Center Administrator can apply EPR to reduce the power consumption of your managed devices.

There are two types of EPR options available for devices and groups—Throttle and Shut Down.

- Steps to configure EPR on a device:
 1. In OpenManage Enterprise, click a device name on the **Devices** page.
 2. Click Power Management and Monitoring tab.
 3. Click Policies and EPR → Apply EPR.
 4. Select **Throttle** or **Shut down** option, and then click **Apply EPR**.

- Steps to configure EPR on a group:
 1. In OpenManage Enterprise, click a group name on the **Devices** page.
 2. Click Group Details → Policies and EPR→Apply EPR.
 3. Select **Throttle** or **Shut down** option and click **Apply EPR**.

Note: For more troubleshooting with respect to EPR on a device or a group, refer the [Whitepaper on Emergency Power Reduction feature](#).

9 Reading Reports

Power Manager offers multiple reports related to the monitoring and management of data. Reports provide a single space for all this data with all the details intact.

The plugin offers a set of built-in reports, which are as follows:

- Power Manager: Power and Thermal Report of Devices
- Power Manager: Metric Thresholds Report for Devices
- Power Manager: Power and Thermal Report of Groups
- Power Manager: Metric Thresholds Report for Groups
- Power Manager: Policy Report for Groups
- Power Manager: Space Headroom Report for Physical Groups
- Power Manager: Power Headroom Report for Physical Groups

The plugin also utilizes the OpenManage Enterprise feature of building custom reports in order to help you build custom reports for capturing power monitoring and management related data.

Note: For troubleshooting with respect to Power Manager reports, see the [Usage of Reports in Data Center through Dell EMC OpenManage Enterprise Power Manager](#) whitepaper.

10 Configuring Dashboards

Reports offer an option to view all the data in a single place, however the dashboard offers a more concise and user-friendly method to view important statistics. This data related to Power Manager is rendered on the **Power Manager** section on the **OpenManage** dashboard (**Home Page**) and **Power Management Overview** page.

10.1 OpenManage Enterprise Dashboard (Home Page)

The OpenManage Enterprise dashboard has a dedicated section for Power Manager with the tabs listed below:

- **Power History**—this tab is for a quick view of the power metrics for a group. You can select three groups at maximum for which you want to view the power metric data directly on the dashboard without navigating to the **All Devices** page and searching for the group details.
- **Thermal History**—this tab is for a quick view of the temperature metrics of a group. You can select three groups at maximum for which you want to see the temperature metric data directly on the dashboard without navigating to the **All Devices** page and seeking for the group details.
- **Top Energy Consumer**—this is a bar graph that shows the top energy consuming devices along with Compute, Chassis and Group filters. This bar graph shows statistics of Top 5 energy consumers along with the energy consumption values shown on the Y-axis.
- **Device Statistics**—this graph shows the count of devices which are Power Manager capable and the count of devices already added to Monitoring List.

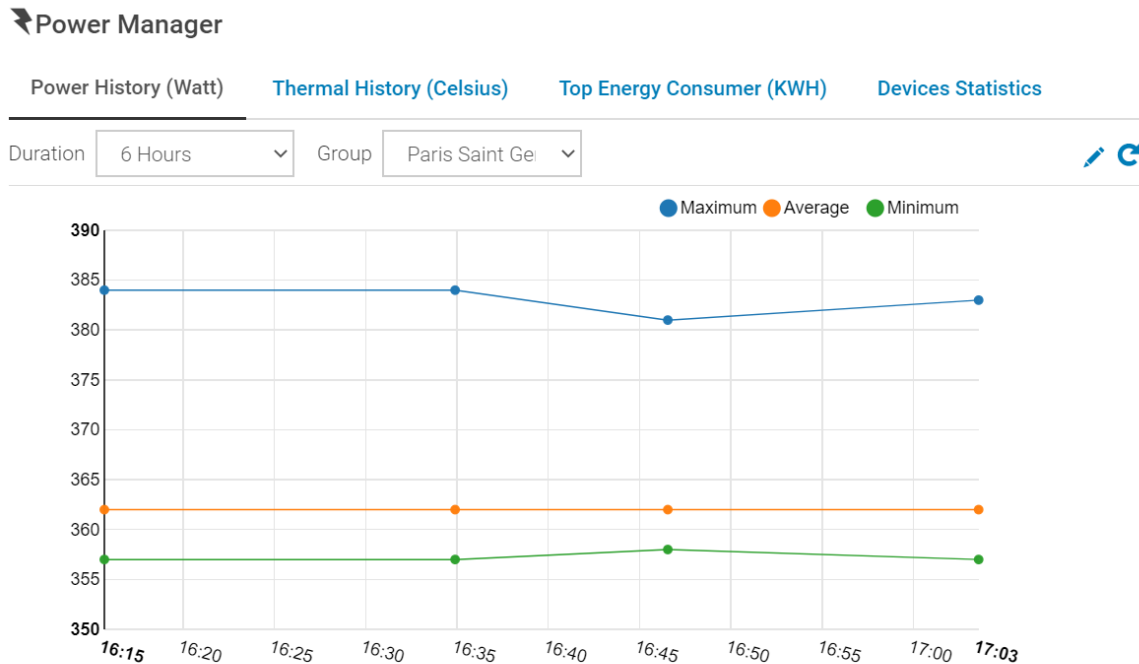


Figure 23 Dashlet for Power History for Group

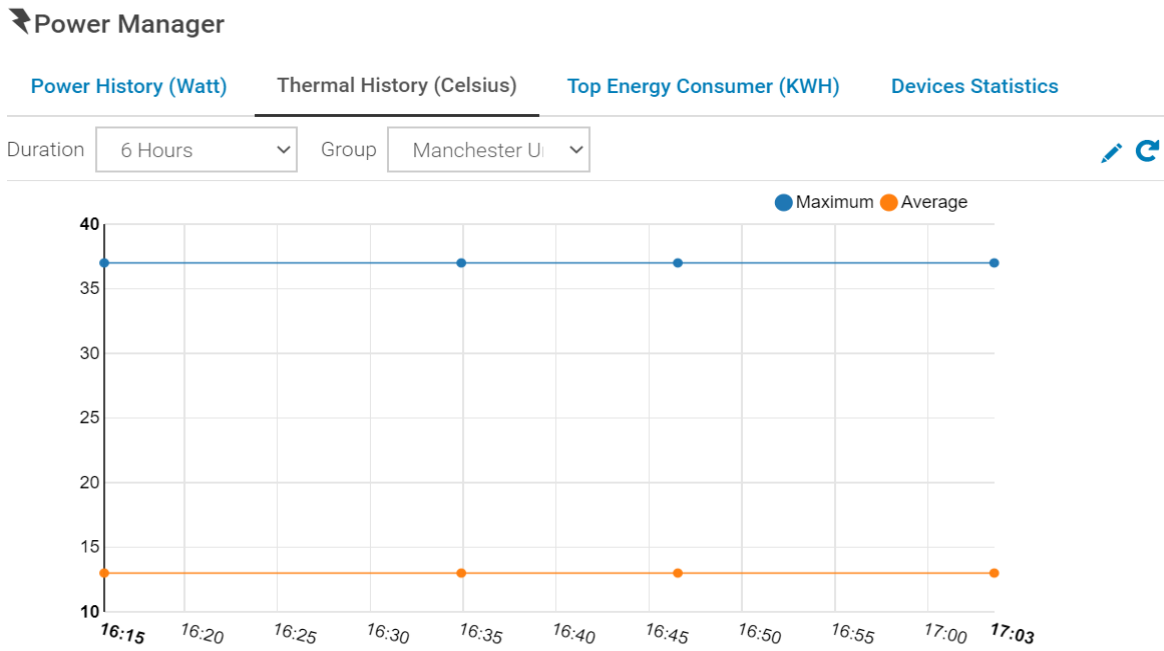


Figure 24 Dashlet for Thermal History for Group

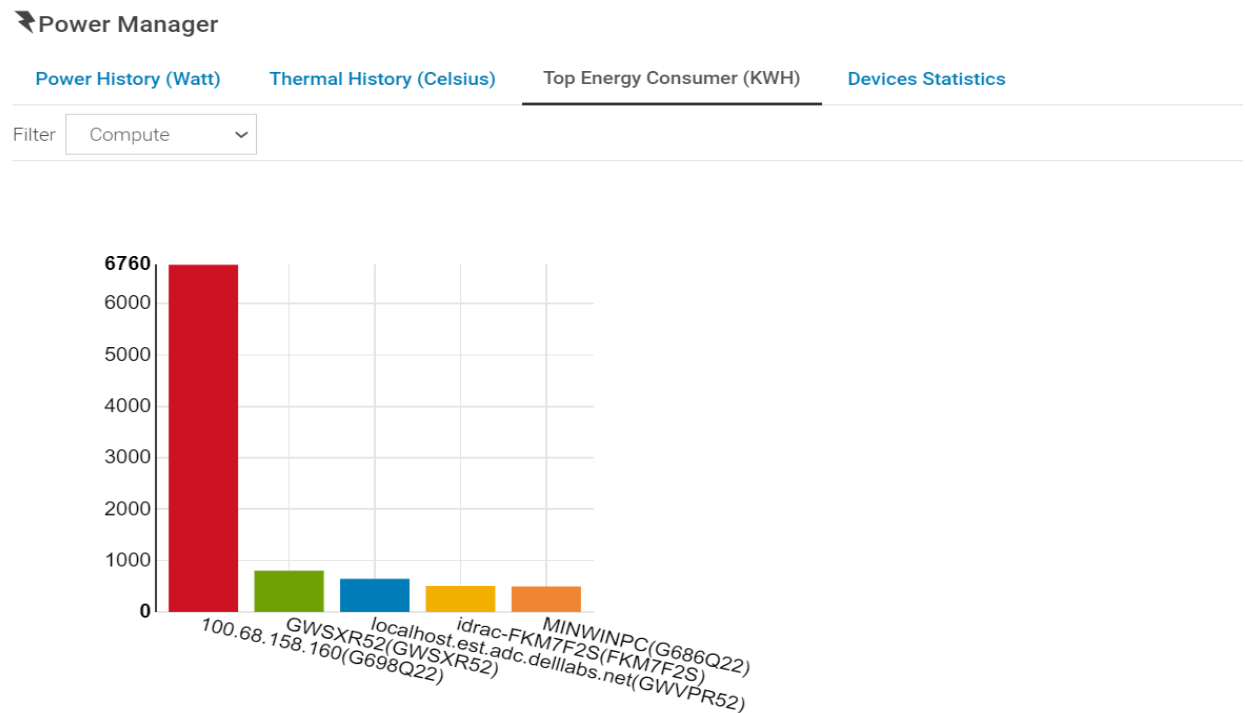


Figure 25 Dashlet for Top Energy Consumer

10.2 Power Management Overview Page

The overview page under Power Management section provides the following information:

Top 10 Power Offenders—this is a table that shows the statistics of top 10 devices and groups for which the power metric has crossed the set threshold values. This table provides option to filter out the list based on Entity Type (Device or Group) and State (Unknown, Normal, Critical or Warning).

Top 10 Temperature Offenders—this is a table that shows the statistics of Top 10 devices and groups for which the temperature metric has crossed the set threshold values. This table provides option to filter out the list based on Entity Type (Device or Group) and State (Unknown, Normal, Critical or Warning).


Power Headroom—this graph displays information regarding the available and used power for a physical group based on the power capacity provided for that group.

Space Headroom—this graph displays information regarding the available and used space for a physical group based on the space capacity provided for that group.

Top 10 Underutilized Racks (Power)—this bar graph shows the top 10 racks listed in descending order of their available power.

Top 10 Underutilized Racks (Space)—this bar graph shows the top 10 racks listed in descending order of their available space.


Top 10 Power Offenders

Entity Type: State: 

ENTITY NAME	SERVICE TAG	TOTAL VIOLATIONS	THRESHOLD STATE
M640CN2.tejd.bdcsv.lab		1	Critical

1 item(s) found. Displaying items 1 - 1.

Top 10 Temperature Offenders

Entity Type: State: 

ENTITY NAME	SERVICE TAG	TOTAL VIOLATIONS	THRESHOLD STATE
M640CN2.tejd.bdcsv.lab		1	Critical

1 item(s) found. Displaying items 1 - 1.

Figure 26 Tables on Power Manager Overview page

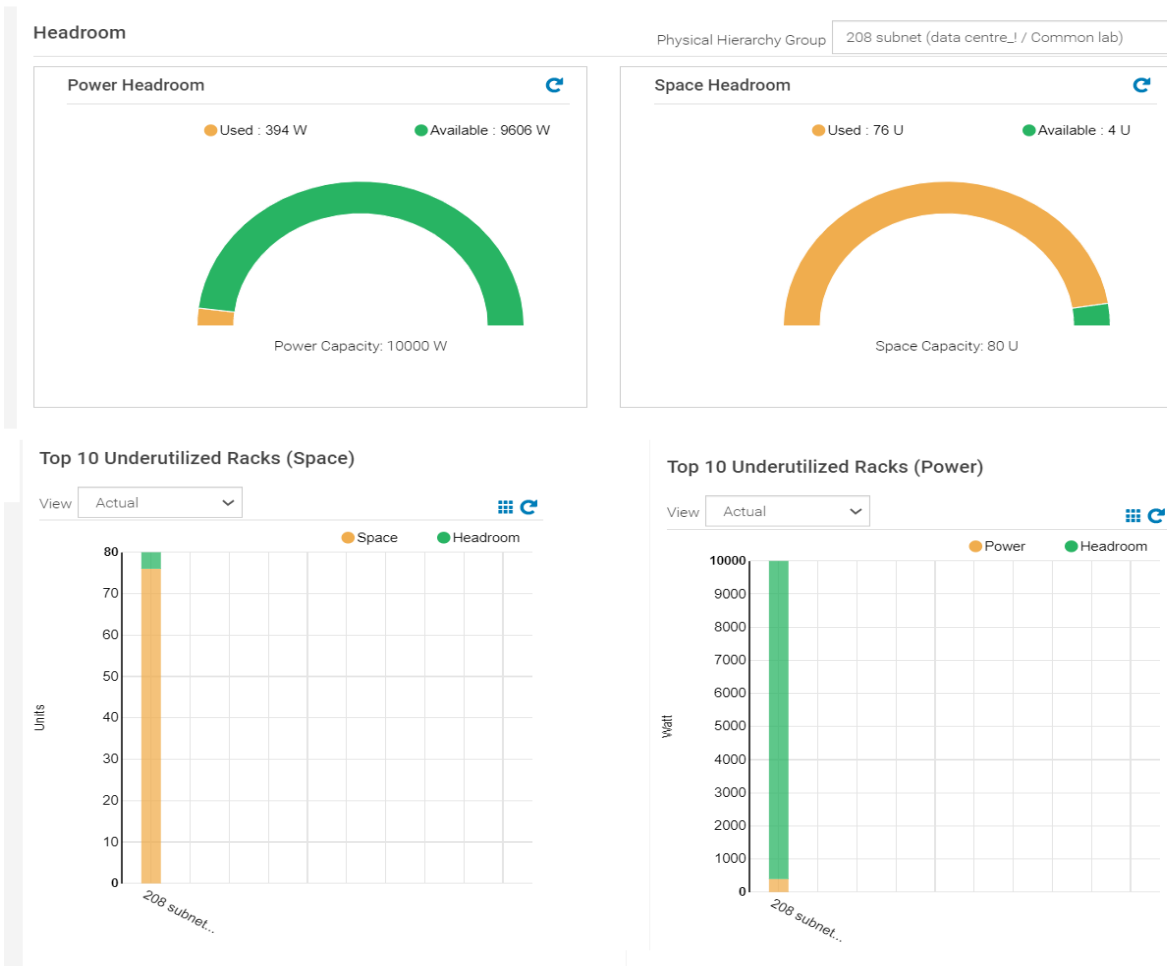


Figure 27 Various dashlets on Power Manager Overview page

11 Conclusion

Power Manager is a powerful tool plugged in to OpenManage Enterprise which comes with a variety of features such as device power, thermal, airflow and CUPs monitoring; threshold and alerting; power capping and EPR; Built-in and custom reports; Power Manager dashboards for Top Offenders of power and temperature for groups and devices; space and power headroom charts to see availability of power and space along a physical infrastructure. This whitepaper aids you with configuring Power Manager using different modes of installation and provides an overview to all the available features as a set up guide for first time users.

12 Terminologies Used

Monitoring—this is the metric collection for various devices and groups.

These metrics for **devices** include Maximum, Minimum, Average and Instant Power; Maximum, Minimum, Average and Instant Temperature; Maximum, Minimum and Average CPU Utilization; Maximum, Minimum and Average Memory Bandwidth Utilization; Maximum, Minimum and Average Input Output Utilization; System Airflow and Energy Consumption.

Metrics supported for groups include Maximum, Minimum and Average Power; Maximum, Minimum and Average Temperature; and System Airflow in which case these values are aggregated from the values received from the devices part of these groups.

Monitoring List— for devices to be monitored they must be included under the scope of PMP for the same. For which the devices are to be added to a list of devices by the user. This list is called the Monitoring List.

Management— this is for the actions or configuration changes that you can perform on the devices using Power Manager either directly or by virtue of OpenManage Enterprise events generated.

For Example, Emergency Power Reduction (EPR) by either throttling the power or powering off the device.

Note: For more information about the supported metrics for various device types, see [Power Manager 1.2 User's Guide](#).

13 Technical Support

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