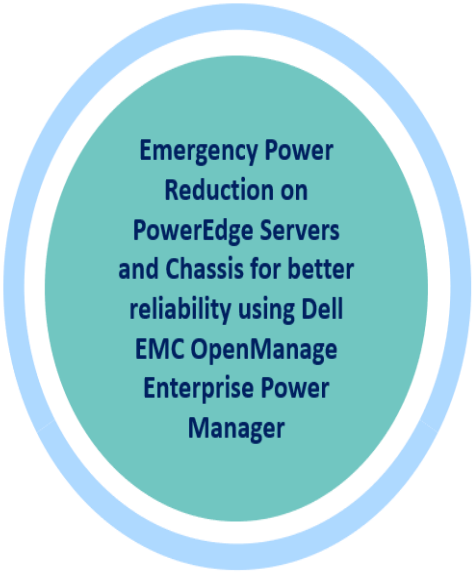
DELL Technologies

Technical Whitepaper

Emergency Power Reduction (EPR) feature with OpenManage Enterprise Power Manager



Abstract

This white paper provides an overview about the effective utilization of Emergency Power Reduction feature in a datacenter environment with Dell EMC OpenManage Enterprise Power Manager.

August 2020

Revisions

Date	Description
August 2020	Initial Release with OpenManage Enterprise 3.4.1 and Power Manager 1.2 versions.

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Author: Jimmy Muraleedharan, Test Senior Engineer

Support: Shruthi Ravoor, Technical Content Developer 2

Infographics: Moncy Lavy, Advisor, Engineering Graphic Design

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Acronyms

Acronym	Expansion
OME	OpenManage Enterprise
iDRAC	Integrated Dell Remote Access Controller
EPR	Emergency Power Reduction
CMC	Chassis Management Controller
MM	Management Module
MCM	Multi Chassis Management
MSM	Modular System Management
REST	REpresentational State Transfer
GUI	Graphical User Interface
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
API	Application Program Interface
PDU	Power Distribution Unit

Executive Summary

This technical whitepaper describes the significance of Emergency Power Reduction (EPR) in modern datacenters and the application of same with Dell EMC OpenManage Enterprise Power Manager. It also talks about:

- How and when to use EPR
- Types of EPR—Throttle and Shutdown, Manual and Temperature-Triggered
- How to enable and disable EPR from Power Manager
- Importance of group level hierarchies while applying the EPR

This document provides a comparative study of power and energy consumption in devices when EPR is enabled from Dell EMC OpenManage Enterprise Power Manager.

1 Introduction

Dell EMC OpenManage Enterprise Power Manager is an extension to Dell EMC OpenManage Enterprise console and uses fine-grained instrumentation to provide increased visibility over power consumption, anomalies, and utilization.

EPR feature in Power Manager, in conjunction with latest Dell EMC PowerEdge servers and chassis provide an effective method to initiate power reduction in the occurrence of an emergency such as a drop in Datacenter Power Availability or malfunctioning of Datacenter Cooling Mechanisms. Along with the Static or Physical Group level hierarchies created in OpenManage Enterprise, this feature is available at all levels of a datacenter down to an individual server, which allows administrators to be extremely precise in selecting what to slow down.

The following infographics provide a pictorial representation of **Apply EPR** action from Power Manager in case of a rack Power Distribution Unit (PDU) failure.

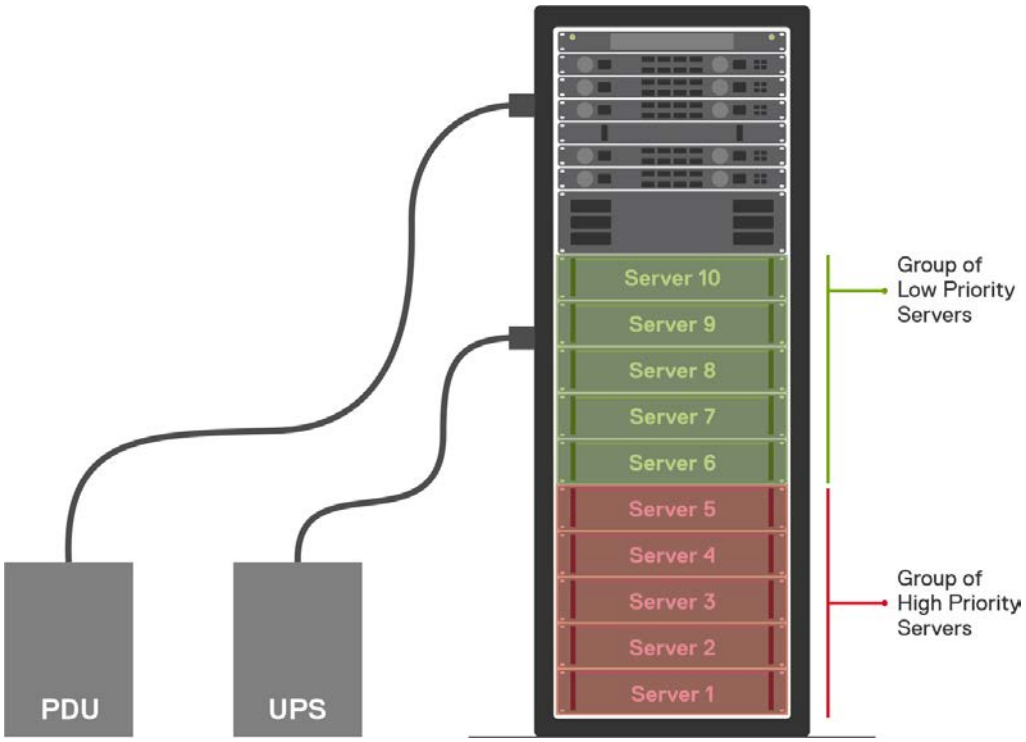

Figure 1 Rack with groups of High Priority and Low Priority servers, powered by PDU and UPS

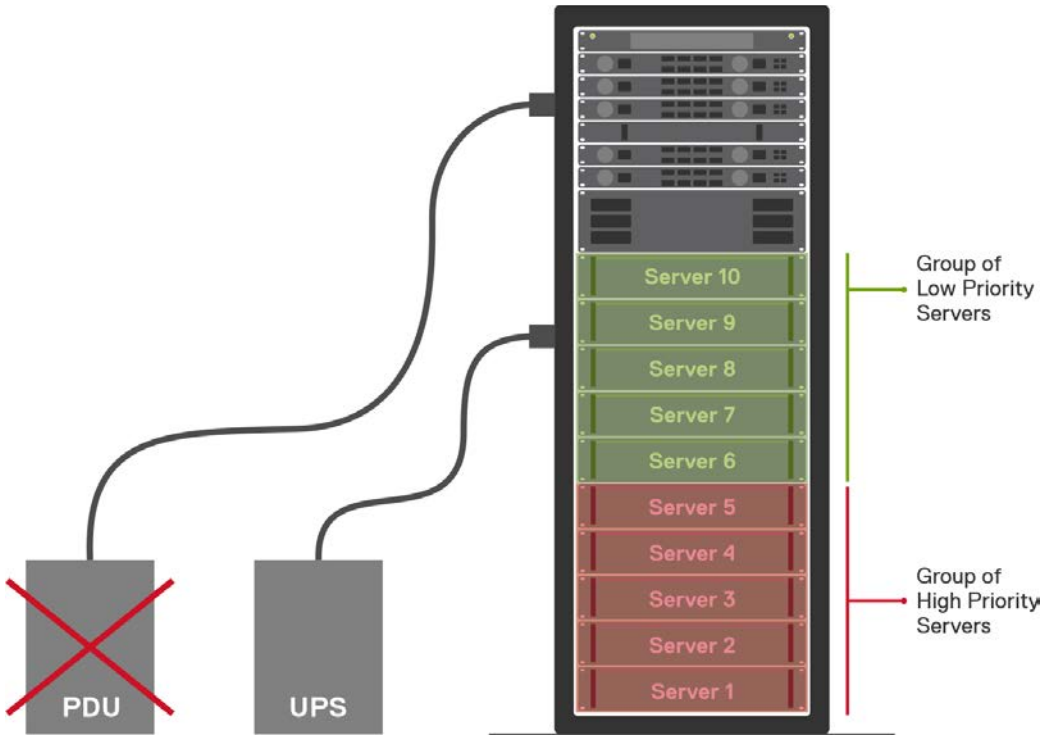

Figure 2 Power Distribution Unit (PDU) failure causing a drop in overall Rack Power Availability

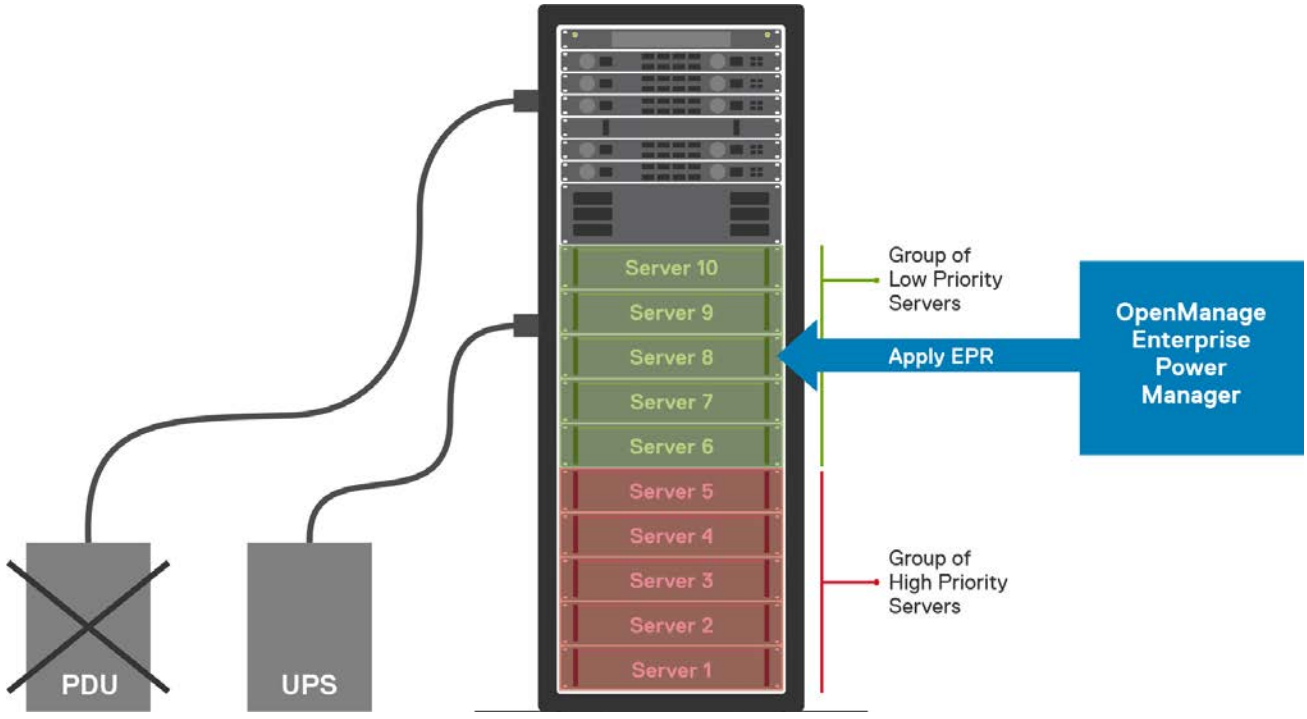

Figure 3 EPR applied by Power Manager on Low Priority Servers when the backup power source is in effect

2 Emergency Power Reduction

In case of an emergency event such as a power failure forcing the datacenter to run on a backup power supply or a failure of the datacenter cooling mechanism, an administrator can initiate EPR to reduce the overall power consumption of the managed devices.

Based on the priority of managed devices, use different EPR actions for different devices. Throttle and Graceful Shutdown are the two different EPR actions supported by Power Manager.

2.1 EPR Throttle

EPR Throttle is supported for PowerEdge servers and chassis. Applying this EPR action throttles power on the devices down to an extremely low level. Configuring devices to a minimal power consumption state impacts the overall system performance.

2.2 EPR Shutdown

EPR Shutdown is supported only for PowerEdge servers. All the selected devices or devices part of a group are gracefully shutdown.

2.3 Prerequisites for EPR Actions

This section provides an overview about the list of prerequisites required for performing EPR actions on Power Manager monitored devices.

2.3.1 License Requirements

You can apply EPR Throttle on servers (iDRAC) and chassis managed by Dell EMC OpenManage Enterprise Power Manager with OpenManage Enterprise Advanced and corresponding iDRAC Enterprise, CMC Enterprise or iDRAC Datacenter license.

EPR Shutdown is supported only for servers with OpenManage Enterprise Advanced license and iDRAC Express, Enterprise or Datacenter license installed.

Table 1 License Requirements for EPR actions on Servers

iDRAC Versions	OME Advanced License	iDRAC Express License	iDRAC Enterprise License	iDRAC Data Center License	Supported EPR Actions
12G and Above	✗	✓	✗	✗	None
	✗	✗	✓	✗	None
	✗	✗	✗	✓	None
	✓	✓	✗	✗	EPR Shutdown
	✓	✗	✓	✗	EPR Throttle, EPR Shutdown
	✓	✗	✗	✓	EPR Throttle, EPR Shutdown

Table 2 License Requirements for EPR actions on Chassis

Chassis Models	CMC Enterprise License	Supported EPR Actions
PowerEdge MX7000	Not Applicable	EPR Throttle
PowerEdge M1000e	Not Applicable	EPR Throttle
PowerEdge VRTX	✔	EPR Throttle
PowerEdge VRTX	✘	None
PowerEdge FX2s	✔	EPR Throttle
PowerEdge FX2s	✘	None

Note: Refer the Compatibility Matrix in OpenManage Enterprise Power Manager User's Guide to check the supported list of PowerEdge servers and chassis.

2.3.2 Privileges and Accessibility

- OpenManage Enterprise User Privileges:
  - The OpenManage Enterprise users can trigger policy actions on Individual Devices with Administrator or Device Manager privileges.
  - Only the Administrators can perform the group level policy actions.
- Managed Device Access — when you are discovering devices in OpenManage Enterprise, ensure that:
  - The management console (iDRAC or CMC or MM) is reachable.
  - The onboarding task is successful.
  - The discovered servers and chassis are in Managed state.
  - The System Lockdown Mode is disabled on iDRAC console for 14th generation and above servers.

3 Enable EPR using Power Manager

Apply EPR either for Individual Devices or Custom Groups (Static and Physical). To Apply EPR (Throttle or Shutdown), perform the following steps from OpenManage Enterprise after installing Power Manager.

3.1 EPR for Individual Devices

Perform the following steps to apply EPR on individual devices:

1. Login to Dell EMC OpenManage Enterprise and click the **Devices** tab. All devices discovered in OpenManage Enterprise are displayed.
2. From the list of devices, click the Device Name. The details of the device are displayed on the **Overview** page.
3. To view Power Manager related information, click the **Power Management and Monitoring** tab. Navigate to **Policies and EPR** tab and click **Apply EPR** option.

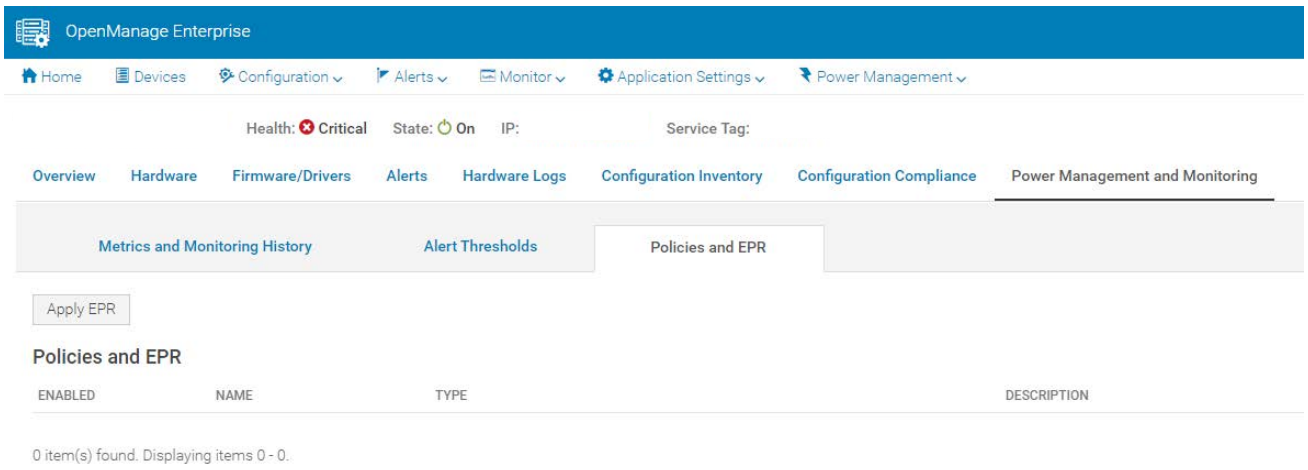

Figure 4 Power Management and Monitoring Tab for Individual Devices

- A popup is displayed with available EPR actions as Throttle and Shutdown.
  - **Throttle**—all the selected devices or devices part of that group consume extremely low-level power and have an impact on performance.
  - **Shut down**—all the selected devices or devices part of that group gracefully shutdown.

4. Select any one of the EPR options and click **Apply EPR**.

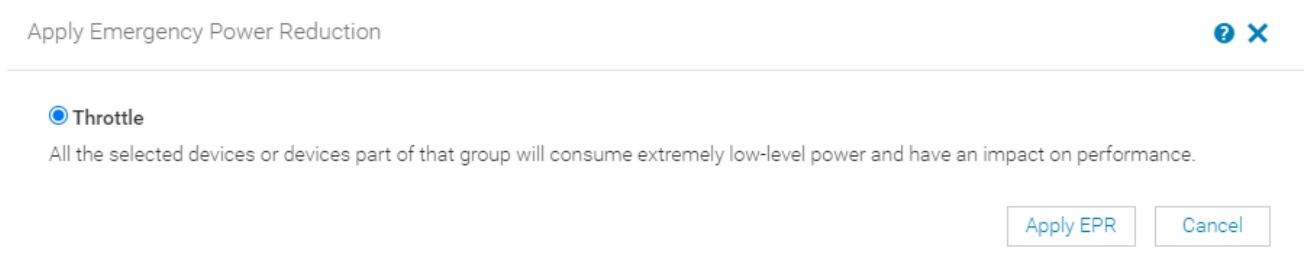

Figure 5 EPR action available for a chassis

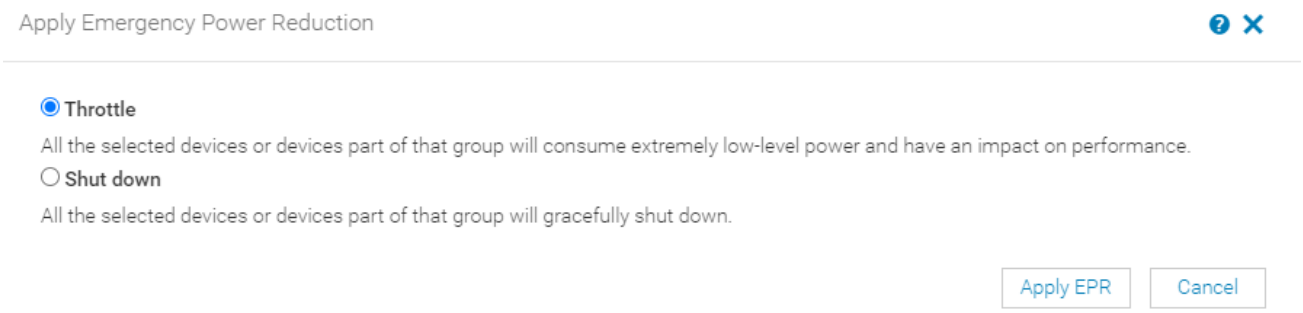

Figure 6 EPR Actions available for Servers

- After applying EPR on the target device, on the Policies and EPR tab of devices with an active EPR, a red color banner is displayed with the following message:
  EPR Throttle (or EPR Shut down) is enabled. EPR is applied manually.

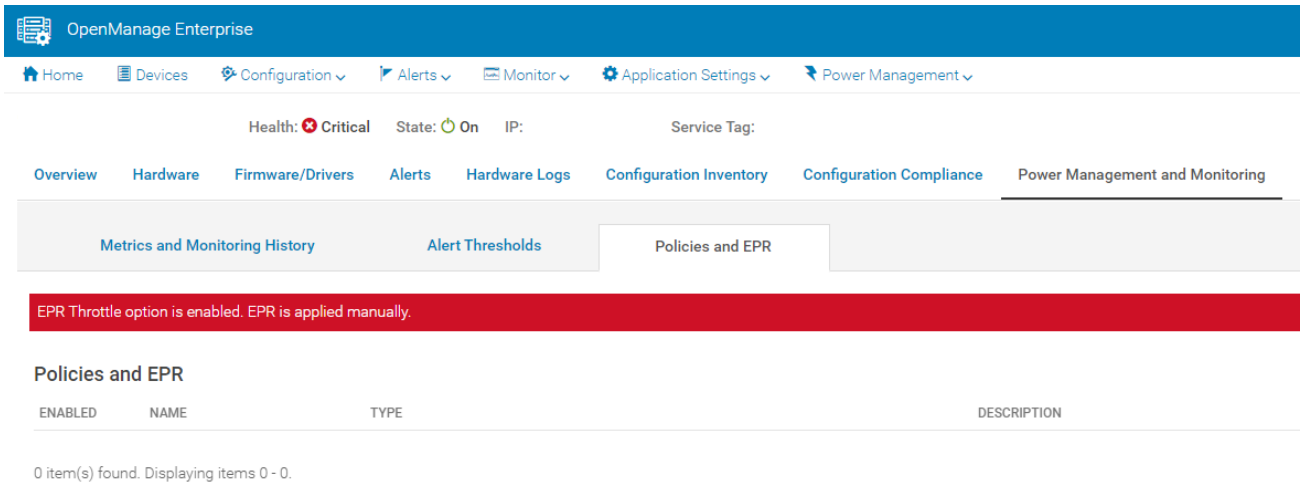

Figure 7 Banner indicating EPR type and Source in Device Details

- EPR is applied successfully on target device and the details are available in **Power Management > Emergency Power Reduction** tab.

On a device level, the applied EPR details are available in **Power Management and Monitoring > Policies and EPR** tab.

A corresponding audit log entry is available in **Monitor > Audit Logs** tab as follows:

Message ID—CPWR0025, Severity—Info, Category—Configuration

Message—The Emergency Power Reduction feature is enabled on the device <Device Name>.

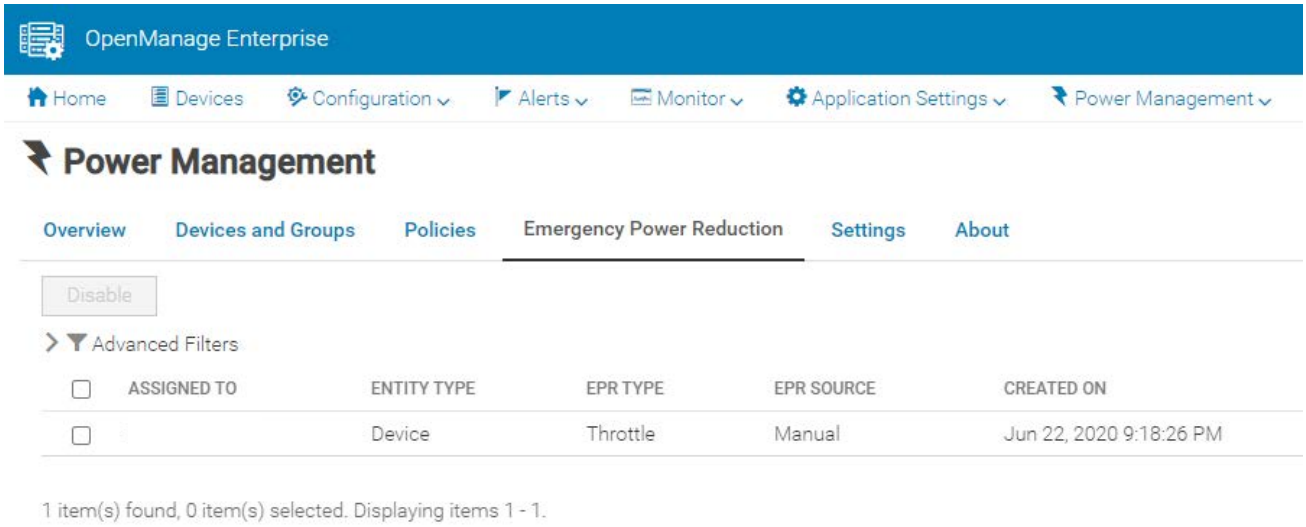

Figure 8 EPR Details (for Device) on Emeregency Power Reduction tab

For a device that is monitored as part of a physical group, apply EPR from **Power Management > Rack View** tab. To apply EPR on a device:

1. Click device name of Power Manager capable devices from **Rack View**. The **Power Management and Monitoring details** tab is displayed.
2. Navigate to **Policies and EPR** tab and click **Apply EPR**.

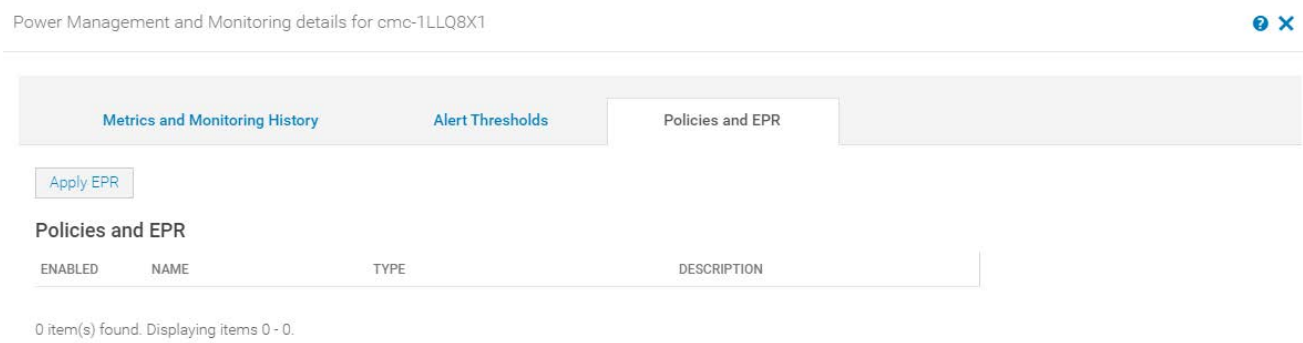

Figure 9 Apply EPR on devices from Rack View tab

3.2 EPR for Static and Physical Groups

1. Login to Dell EMC OpenManage Enterprise and navigate to **Devices > Static Groups > Group Name** or **Devices > Extension Groups > Physical Hierarchy > Group Name.**
   All devices that are part of the selected group are displayed.
2. To view Power Manager related information, click **Group Details.**
3. In **Group Details** tab, navigate to **Policies and EPR** tab, and then click **Apply EPR** button.
   A popup is displayed with available EPR actions as Throttle and Shutdown.

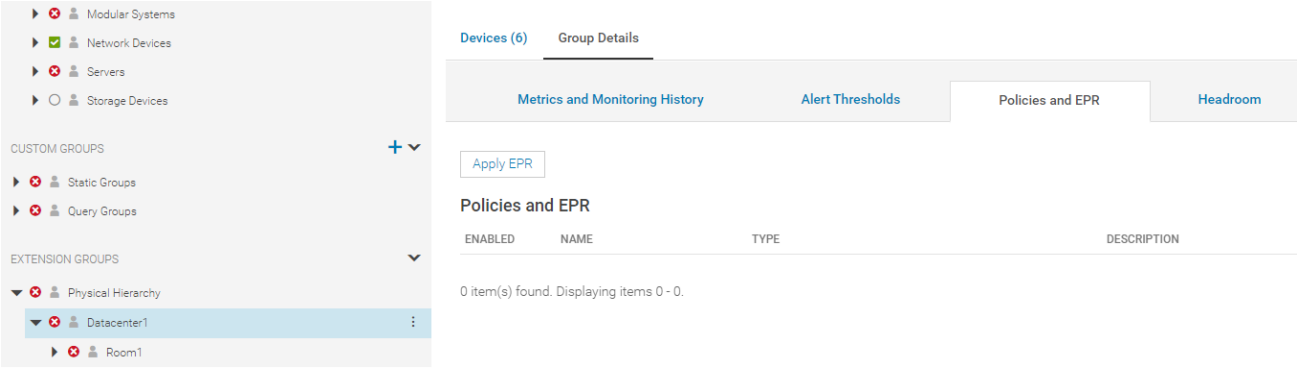

Figure 10 Group Details tab for Physical Groups

4. Select an EPR action and click **Apply EPR** option.

Note: If a monitored group consists of servers and chassis, on selecting Shut down option, only the servers in the group are shut down because the shutdown option is applicable only for servers.

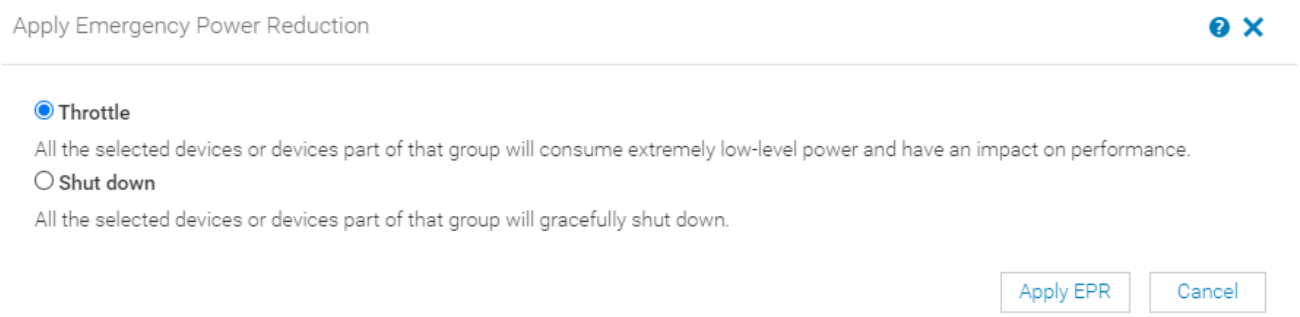

Figure 11 EPR Actions available for Static and Physical Groups

5. EPR is applied on the target device and the corresponding details are available in **Power Management > Emergency Power Reduction** tab.
   Corresponding audit log entries are available in **Monitor > Audit Logs** tab for each device(s) monitored as part of the group.

   Message ID—CPWR0025, Severity—Info, Category—Configuration
   Message—The Emergency Power Reduction feature is enabled on the device <Device Name>.

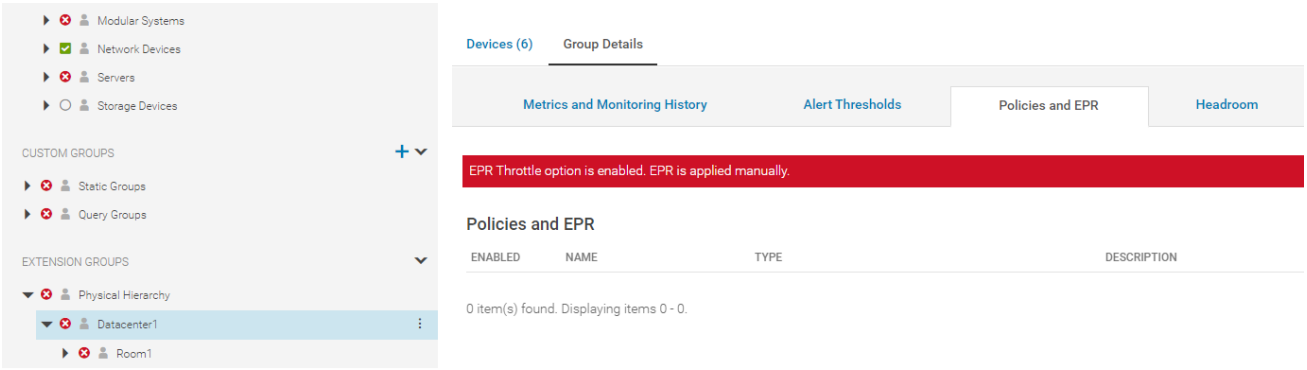

Figure 12 Banner indicating EPR type and Source in Group Details tab

Audit log(s) also mention the task status and corrective actions required for failed EPR actions on target devices.

- *Message ID—CPWR0023, Severity—Warning, Category—Configuration*
  Message—Unable to enable the Emergency Power Reduction feature on the target <Device Name> because the feature is already enabled on the target.

- *Message ID—CPWR0026, Severity—Critical, Category—Configuration*
  Message—Unable to enable the Emergency Power Reduction feature on the target <Device Name> because the device is either unreachable or does not have necessary license

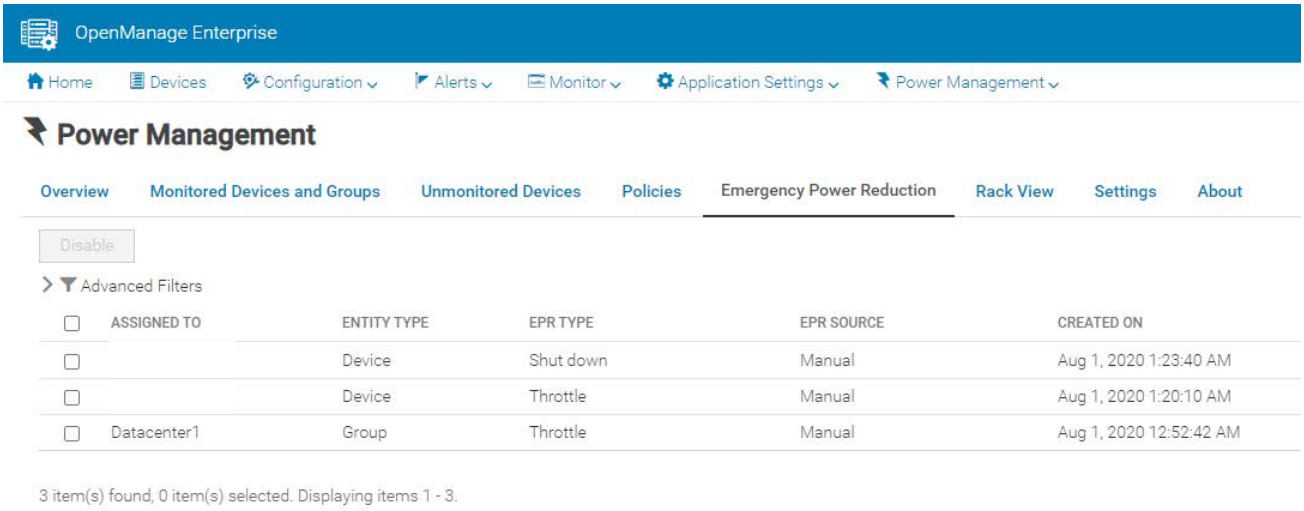

Figure 13 EPR Details for devices and groups in Power Management tab

4 Disable EPR using OpenManage Enterprise Power Manager

To disable the EPR, perform the following steps:

1. Login to OpenManage Enterprise and navigate to **Power Management > Emergency Power Reduction** tab.

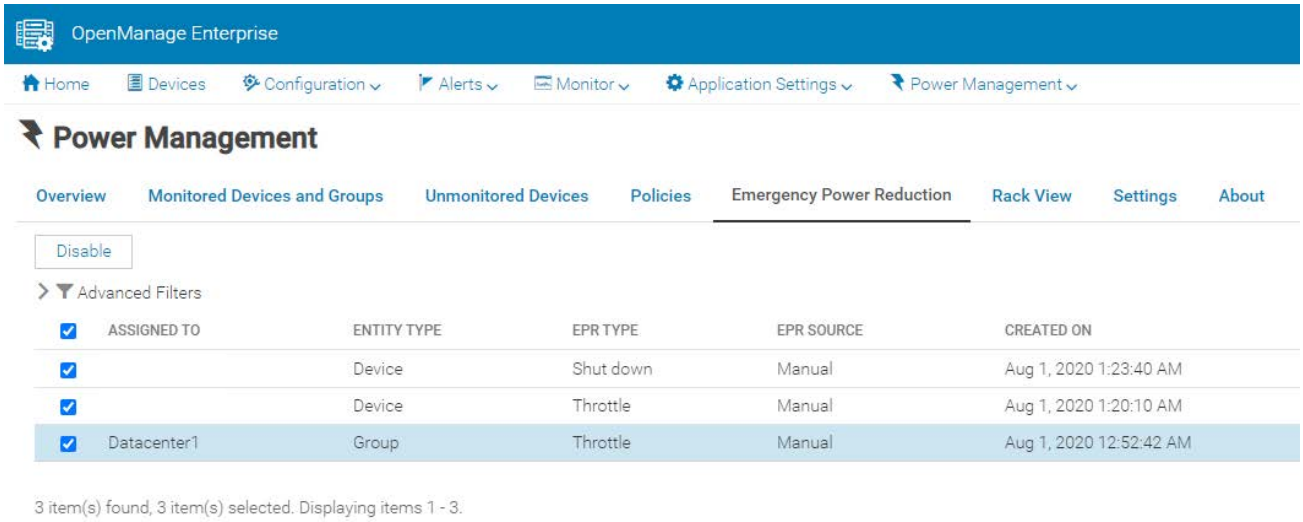

Figure 14 Emergency Power Reduction tab in Power Management section

2. Select the device(s) or group(s) for which you want to disable EPR and click **Disable**.
3. In the confirmation page, click **Yes**. EPR is disabled successfully.

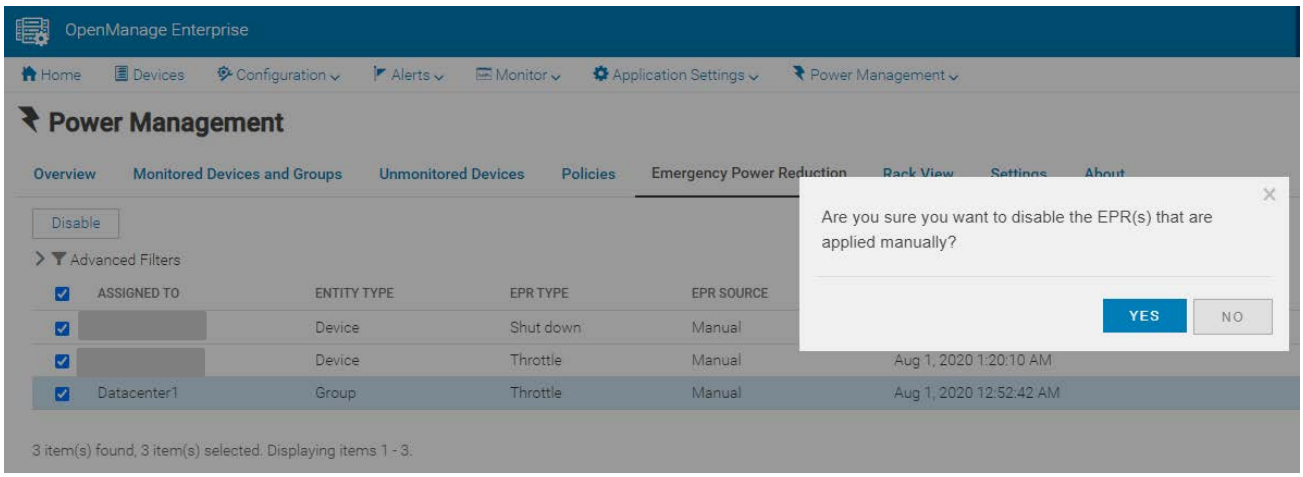

Figure 15 Confirmation message displayed on Disabling EPR's

4. All disabled EPR's are removed from the target device and **Power Management > Emergency Power Reduction** tab.
5. Corresponding audit log entries will be available in **Monitor > Audit Logs** tab for each device(s) monitored as part of the group.

   Message ID—CPWR0027, Severity—Info, Category—Configuration

Message—The Emergency Power Reduction feature is successfully disabled on the target <Device1>.

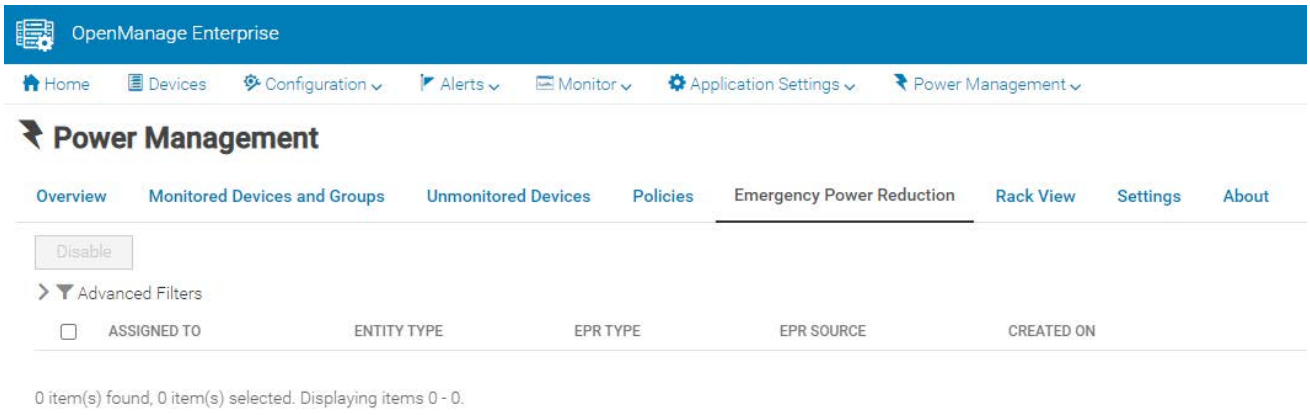

Figure 16 Emergency Power Reduction tab in Power Management section

Audit log(s) also mention the task status and corrective actions required for failed EPR actions on target devices.

Message ID—CPWR0028, Severity—Warning, Category—Configuration

Message—Unable to disable Emergency Power Reduction on the device <Device Name> because it is unreachable.

Note: If EPR is enabled on a device, and the device is removed from Power Manager due to an expired or deleted license, then you cannot access the device through Power Manager.
The disable EPR action initiated from Power Manager fails when the device is not reachable. However, the EPR entry is removed from **Power Management > Emergency Power Reduction** tab. To disable EPR, go to the iDRAC or CMC console of the target device and remove the EPR.

5 Temperature-Triggered EPR (Throttle)

Use Temperature-Triggered policy to prevent damage to devices due to overheating in the event of cooling infrastructure failure. It limits the processing capability of the devices in the group, hence reducing the possibility of any damage to device due to overheating. The policy helps in maintaining data center temperature to align to the standards defined by American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE).

Create Temperature-Triggered policy on a group (static or physical) monitored by Power Manager, by defining a temperature threshold value. After defining the threshold value and enabling the policy, if the average inlet temperature of the group crosses the temperature threshold value, Power Manager enforces an EPR (Throttle) on the group. On the EPR tab **(Power Management > Emergency Power Reduction)**, the source of EPR (Throttle) is displayed as Temperature-Triggered.

Following infographics provides a pictorial representation of Apply EPR (Throttle) action from Power Manager in case of a cooling infrastructure failure.

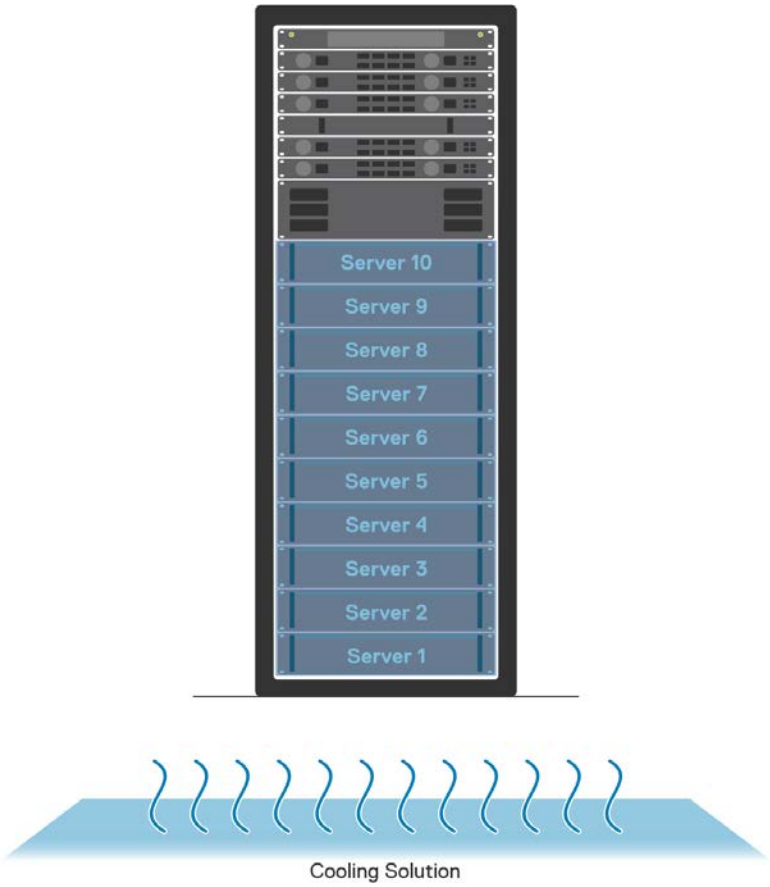

Figure 17 Datacenter with a functional cooling infrastructure. Rack(s) and associated device(s) are monitored in Power Manager as physical group(s)

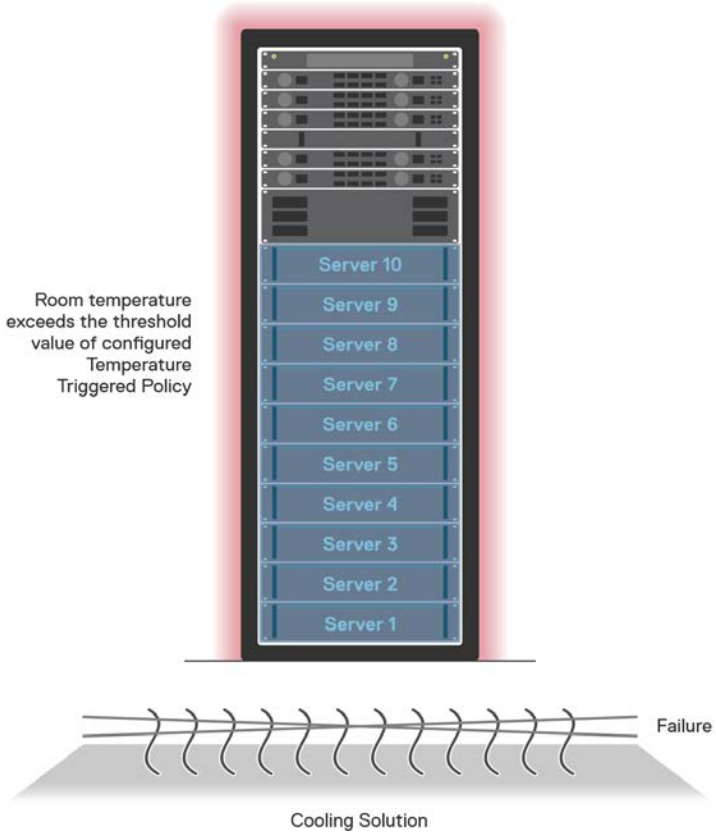

Figure 18 Overheating due to the failure of cooling infrastructure

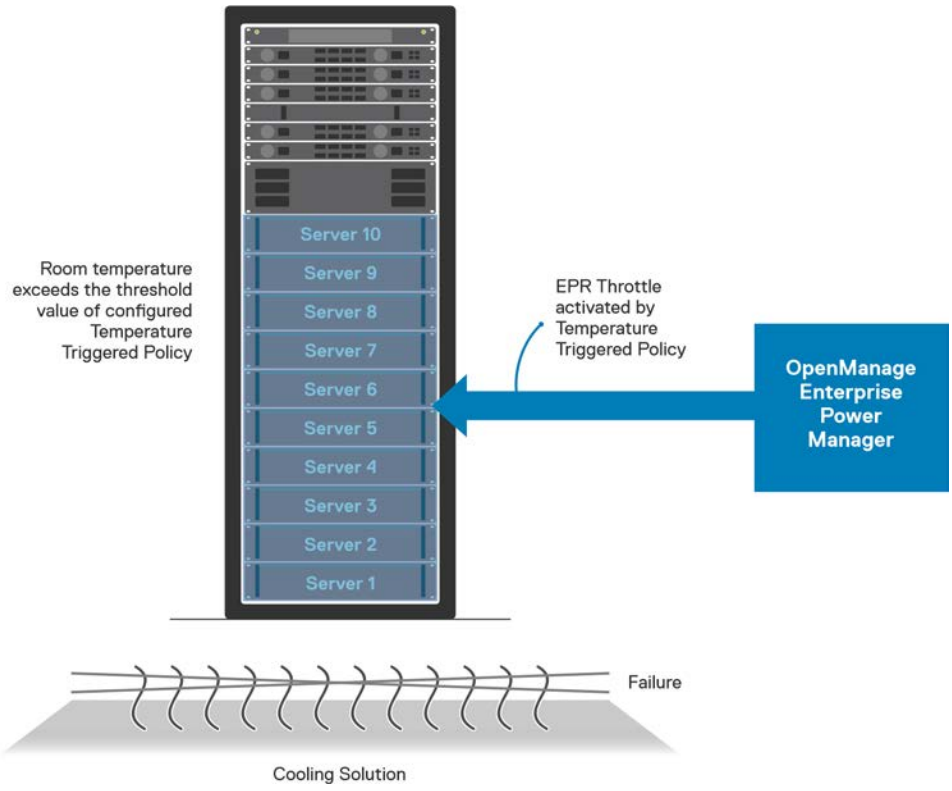

Figure 19 Temperature-Triggered EPR (Throttle) applied by Power Manager

5.1 Create Temperature-Triggered Policy

To create a Temperature-Triggered policy, perform the following steps:

1. Login to OpenManage Enterprise and navigate to **Power Management > Policies**.
2. Click **Create** to launch the policy creation wizard.
3. Select the policy Type as **Temperature-Triggered.**

Note: Modifying the type of policy after creation is not supported.

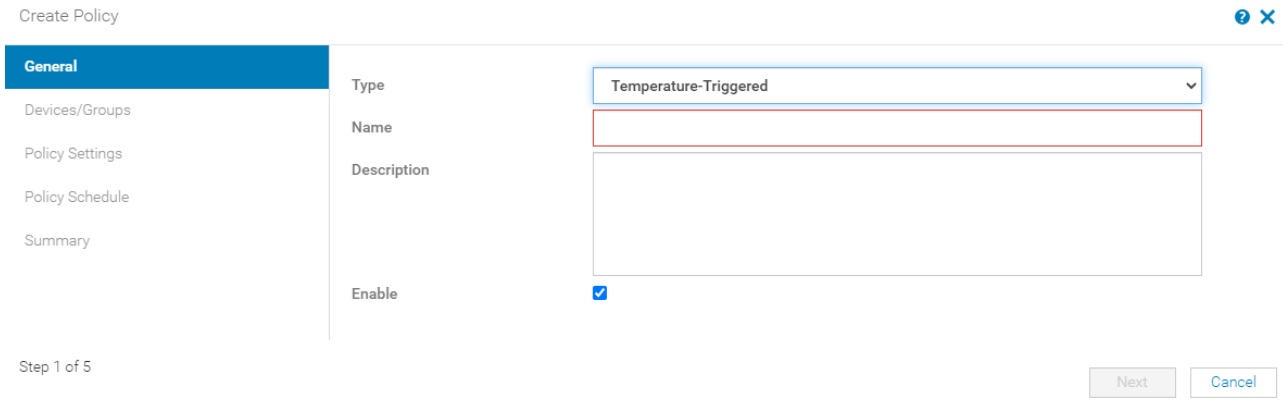

Figure 20 Create Temperature-Triggered policy

4. Enter the policy name and description (optional).
   Policy is enabled by default.
   To disable the policy after it is created, clear the **Enable** checkbox.
5. Select a static or physical group monitored in Power Manager for creating a Temperature-Triggered policy.

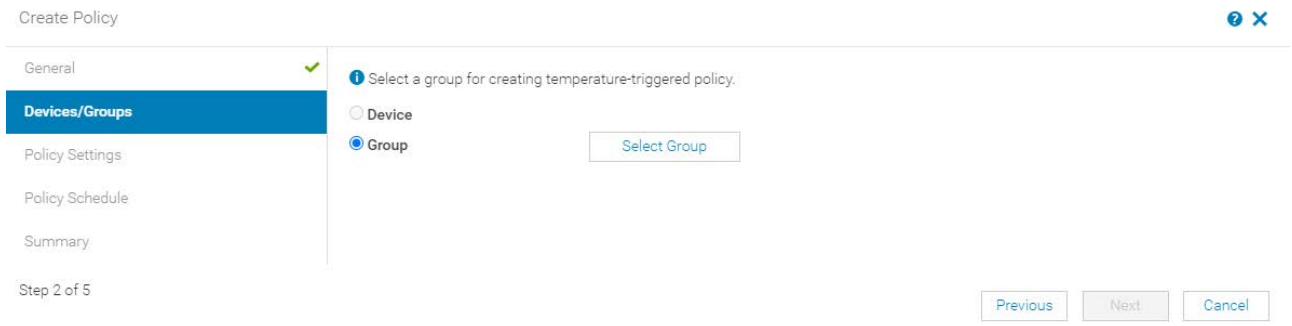

Figure 21 Select Group from Devices/Groups tab

You can filter the list of all monitored groups in Power Manager either by Group Name or Group Type. Available options for Group Type filter include All, Static and Physical.

Note: Both static and physical groups monitored in Power Manager are available for selection by default. Location details are displayed only for physical groups with group tag as Room, Aisle or Rack.

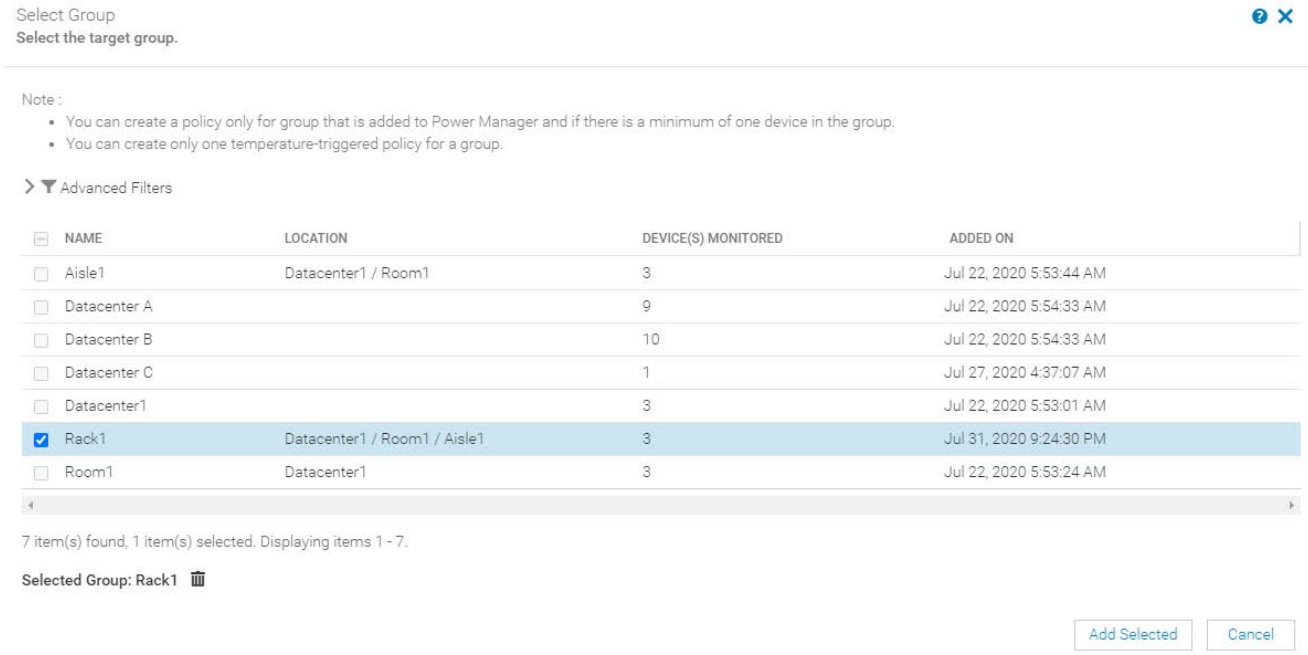

Figure 22 Select Static or Physical Group to create Temperature-Triggered policy

Note: Temperature-Triggered policy is supported only for groups monitored by Power Manager and if there is a minimum of one device added in the group.
Note: The group is not available for selection if there is already a Temperature-Triggered policy applied on the group.

6. In Policy Settings, refer to the **Temperature data** section to configure the temperature threshold value. Based on the selection of monitoring time period value, the temperature details are displayed for selected group.

    a. Select any of the ASHRAE recommended values or a custom value from the **Temperature Threshold** drop-down menu.
    Available ASHRAE recommendations in the drop-down menu are as follows.

    - ASHRAE Recommended - 27 degrees Celsius or 81 degrees Fahrenheit
    - ASHRAE Class A1 Allowable - 32 degrees Celsius or 90 degrees Fahrenheit
    - ASHRAE Class A2 Allowable - 35 degrees Celsius or 95 degrees Fahrenheit
    - ASHRAE Class A3 Allowable - 40 degrees Celsius or 104 degrees Fahrenheit
    - ASHRAE Class A4 Allowable - 45 degrees Celsius or 113 degrees Fahrenheit

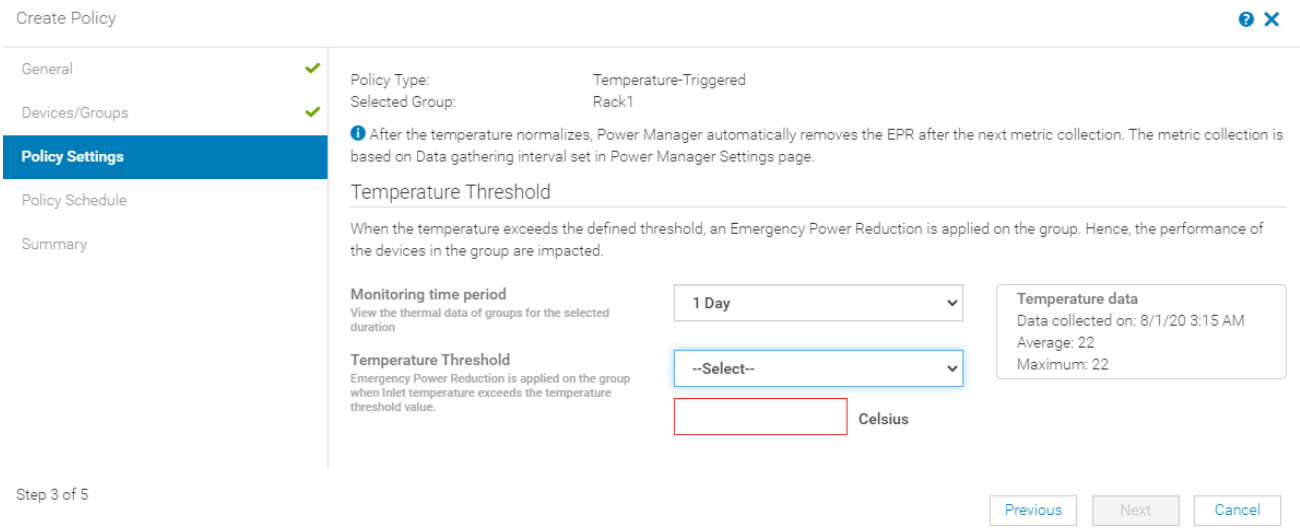

Figure 23 Temperature threshold configuration in Policy Settings section

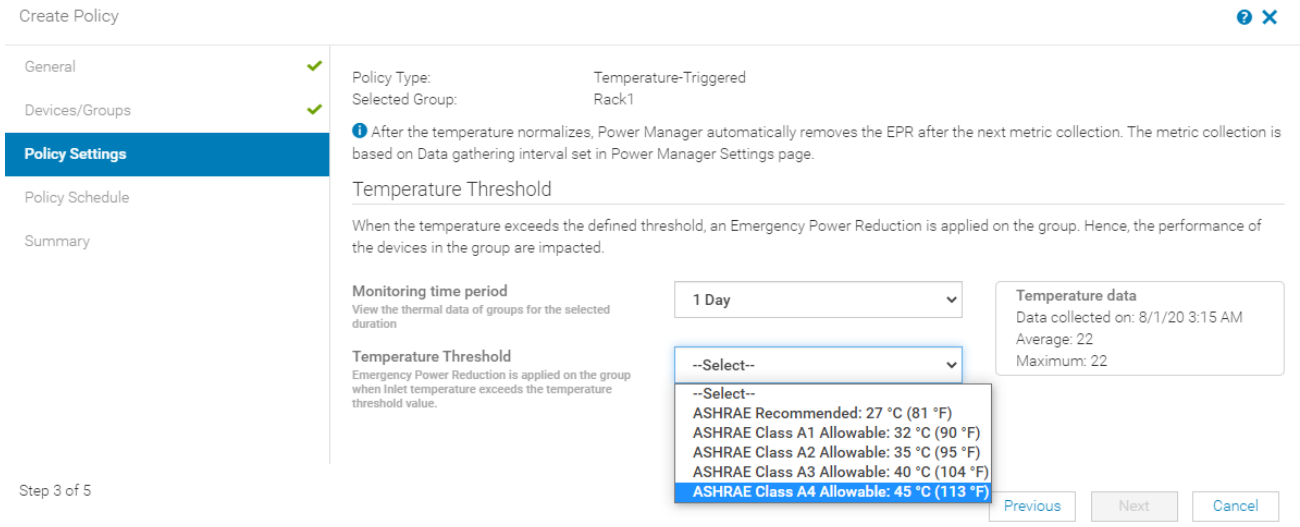

Figure 24 ASHRAE Classes available for selection of Temperature Threshold

Note: Scheduling a Temperature-Triggered policy is not supported, and the policy is always active after creation

7. Review the Summary section after providing the inputs for configuring Temperature-Triggered policy. Summary section gives an overview about the policy name, description, state, assigned group and the configured temperature threshold values. Since Temperature-Triggered policy cannot be scheduled, Date Range, Time Span and Days will be displayed as Always.

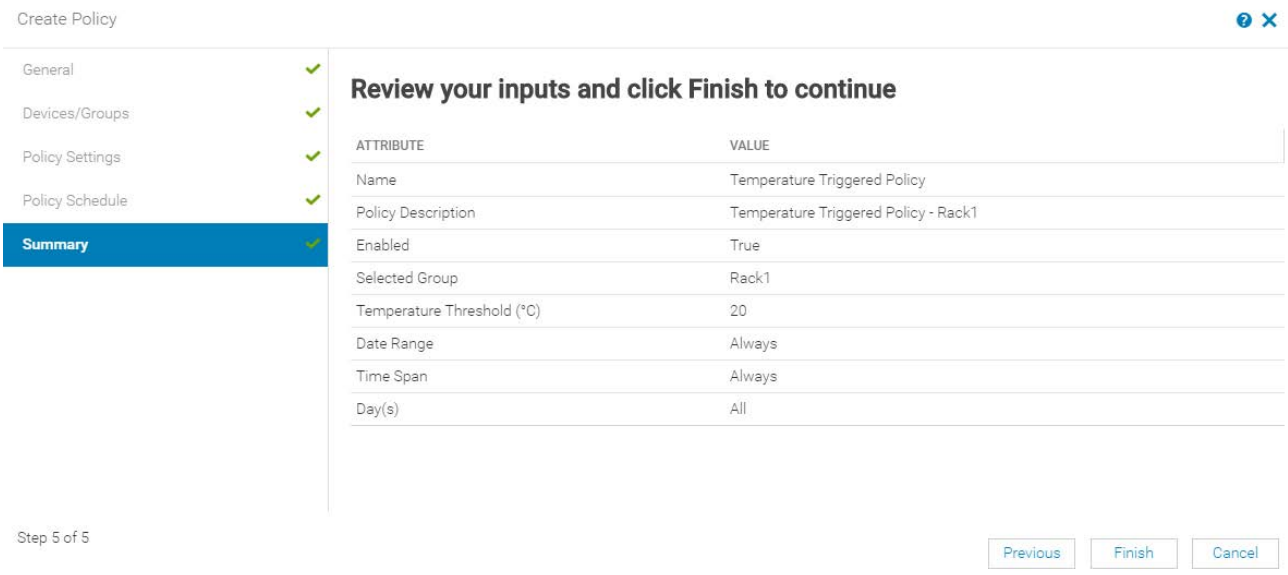

Figure 25 Review policy inputs from Summary section

8. After clicking **Finish**, a Temperature-Triggered policy is created and listed in **Power Management > Policies** page.

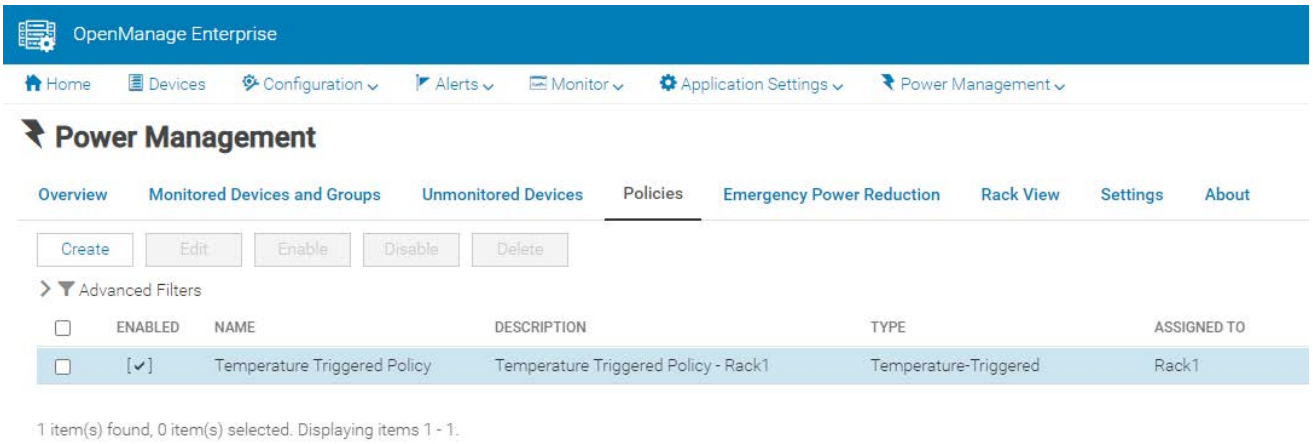

Figure 26 Temperature-Triggered policy listed in policies tab

Note: You cannot modify the type of policy created during an Edit action.

9. When the inlet temperature exceeds the configured temperature threshold value, the Temperature-Triggered policy with EPR Throttle option is applied on the group. And, the source of EPR is displayed as Temperature-Triggered.

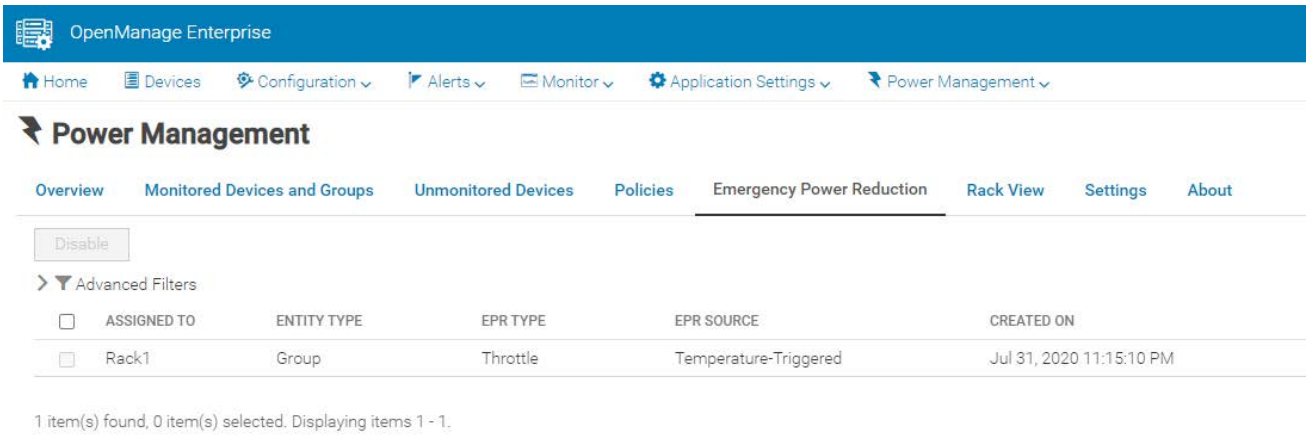

Figure 27 Temperature-Triggered EPR Throttle listed in Emergency Power Reduction tab

Note: You cannot manually disable the EPR Throttle applied by virtue of a Temperature-Triggered policy. However, after the inlet temperature reduces Power Manager automatically removes the EPR.

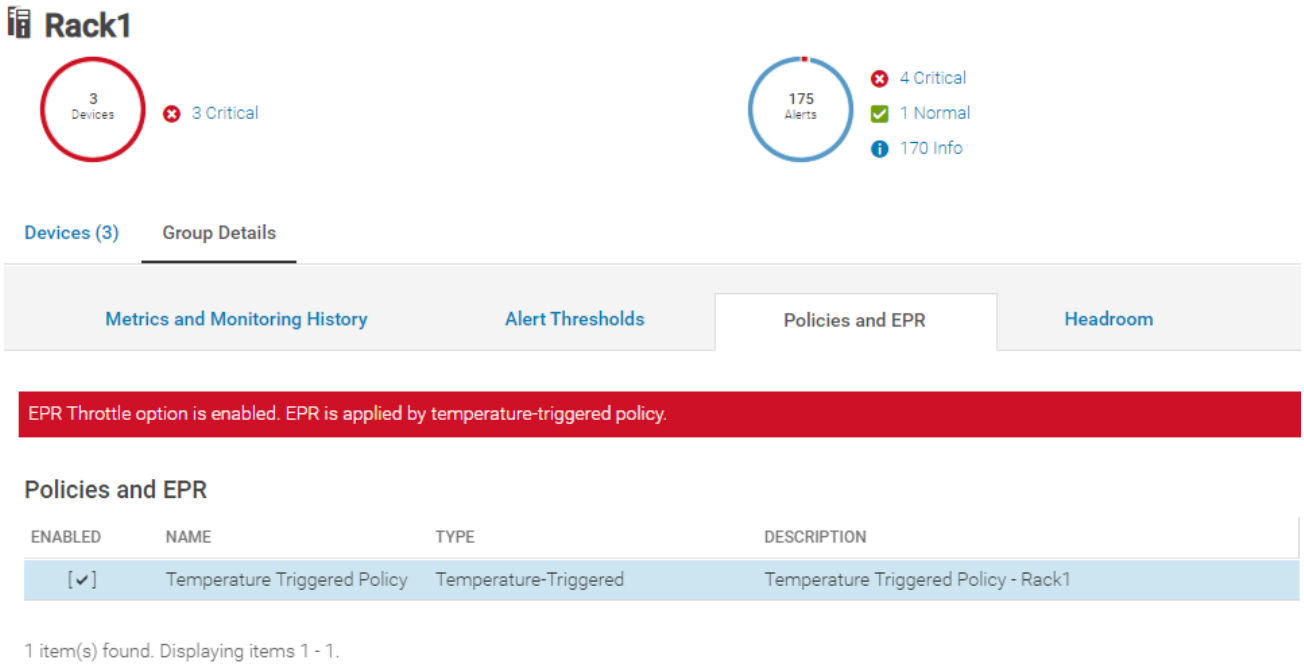

Figure 28 Temperature-Triggered policy and EPR listed on Group Details tab

Corresponding audit log entries are available in **Monitor > Audit Logs** tab for when a Temperature-Triggered EPR is enabled or disabled for the selected groups.

Message ID—CPWR0047, Severity—Critical, Category—Configuration

Message—The temperature of the group <Group Name> has exceeded the threshold temperature set by the temperature triggered policy <Policy Name>.

Message ID—CPWR0050, Severity—Info, Category—Audit

Message—The Emergency Power Reduction feature is successfully enabled on the group <Group Name> by using the temperature triggered policy <Policy Name>.

Note: Power Manager cannot apply Temperature-Triggered EPR (Throttle) when the group already has EPR (Throttle or Shutdown) applied manually or when all the devices monitored as part of the group has EPR (Throttle or Shutdown) applied individually. Following audit log entry is generated in this case.

Message ID—CPWR0023, Severity—Warning, Category—Configuration.
Message—Unable to enable the Emergency Power Reduction feature on the target because the feature is already enabled on the target.

5.2 Disable Temperature-Triggered EPR

Manually disabling a Temperature-Triggered EPR is not supported. After the temperature normalizes, Power Manager automatically removes the EPR after the next metric collection. The duration of metric collection is based on the data gathering interval set in Power Manager Settings **(Power Management > Settings)** tab.

EPR Throttle applied by virtue of Temperature-Triggered policy is removed from Power Manager and the target device when the corresponding policy is disabled, deleted or if the temperature threshold is updated to a value higher than average temperature of the group.

6 Comparative study of Resource Utilization with EPR Throttle configured from Power Manager

A comparative study was done to identify the overall power utilization for devices and groups when an EPR (Throttle) is applied from Power Manager.

Tests have been performed by applying group level EPR Throttle on four PowerEdge R740 servers that are monitored as part of a Static Group in Power Manager.

- Aggregated Power Utilization by Default:
  - The maximum and minimum power utilization for the monitored group was in the range of 167-482 Watts.
  - The average power consumption was ~264 Watts before imposing EPR Throttle on the static group.

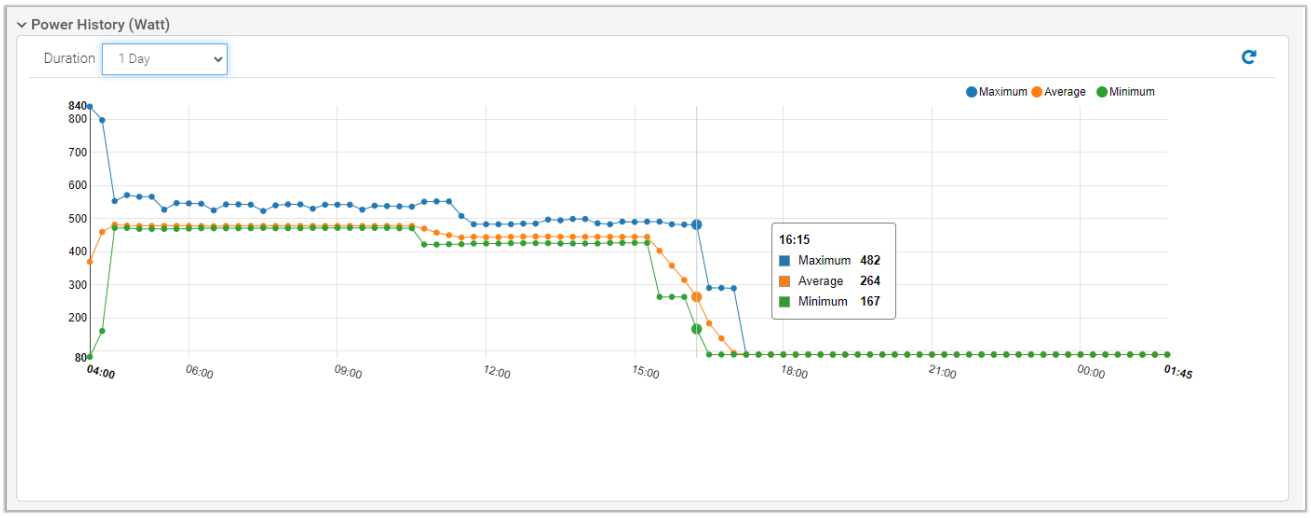

Figure 29 Power History details of a Static Group without EPR (Throttle)

- Aggregated Power Utilization with EPR Throttle
  - With reference to the above image, EPR throttle was applied on the Static Group after 16:15 and the power utilization was rechecked in the next metric gathering interval.
  - The average power utilization was brought down to ~ 90 Watts with the maximum, average and minimum power utilization to the similar values.

Note: With EPR throttle applied on monitored groups, the overall system performance was impacted and the same was displayed in CPU Utilization metrics of individual devices.

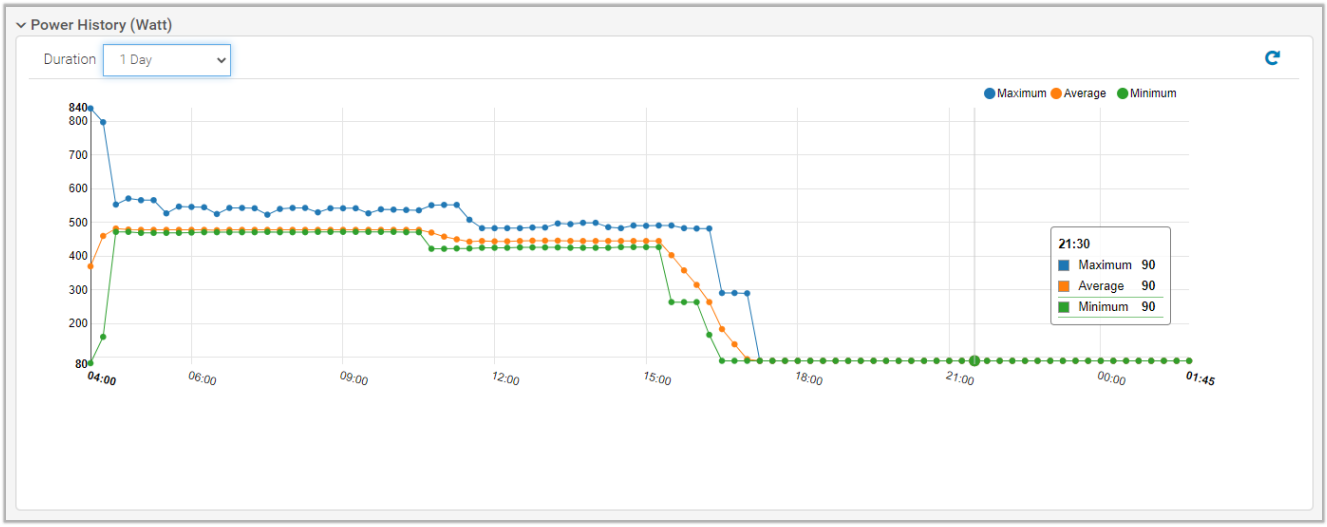

Figure 30 Power History details of a Static Group after applying EPR (Throttle)

7 Frequently Asked Questions

What is Max Power Conservation Mode (MPCM) in CMC? How is MPCM associated with Power Manager actions?

When Maximum Power Conservation Mode is enabled on a chassis, all connected blade servers start functioning at their minimum power levels, and all subsequent server power allocation requests are denied. In this mode, the performance of powered on servers may be degraded. Additional servers cannot be powered on, regardless of the server priority.

Configuring EPR throttle for CMC (PowerEdge M1000e, PowerEdge FX2/FX2s, PowerEdge VRTX) enables the MPCM mode in chassis.

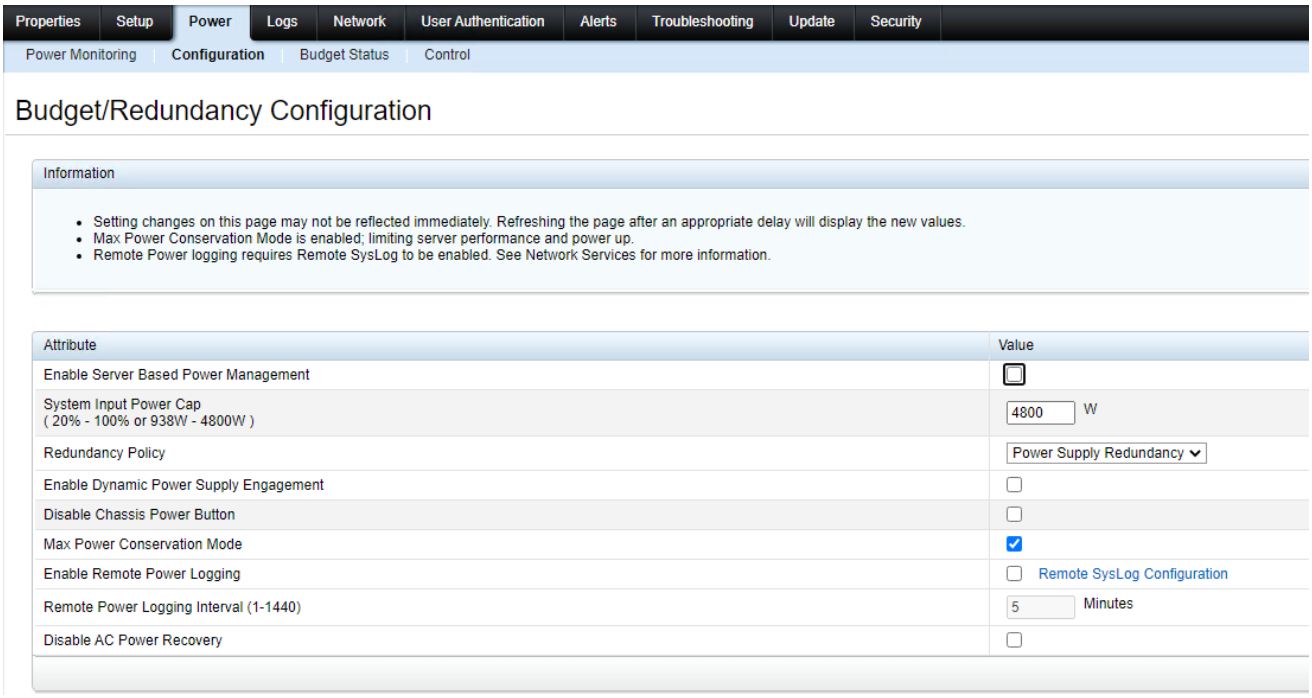

Figure 31 Max Power Conservation Mode enabled in CMC with EPR Throttle action

Can I remove individual devices or static groups from Power Manager monitoring list when there is an active EPR (Throttle or Shutdown) applied from Power Manager?

Description:

Removal of monitored Static Groups and Individual Devices (**from Power Management > Monitored Devices and Groups**) is restricted with the following error message when there is an active EPR applied at group or device level.

CPWR0099—Unable to remove disassociate devices or groups from the Power Manager because Emergency Power Reduction is active of <Device Name or Group Name>.

Resolution:

Disable EPR and remove static groups or devices from Power Manager. In case of Temperature-Triggered EPR (Throttle), disable or delete the corresponding Temperature-Triggered policy and retry the operation.

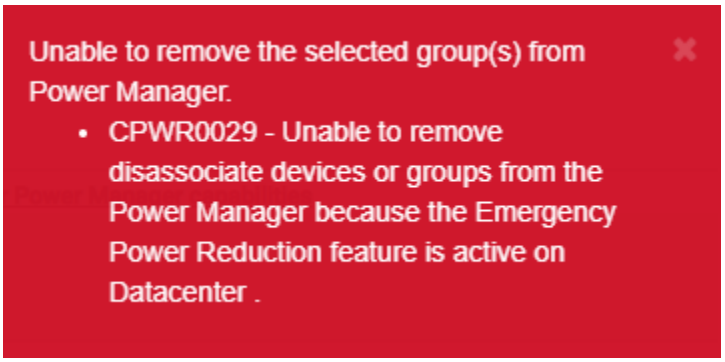

Figure 32 Message displayed on removing static groups with active EPR from Power Manager

Can I add any device(s) monitored or managed in OpenManage Enterprise, into a physical group with an active EPR applied from Power Manager?

Description:

Addition of devices are restricted into a Rack physical group with an active EPR (Throttle or Shutdown). The task fails with a message as *Unable to add the device to the rack because the Emergency Power Reduction (EPR) feature is currently enabled on the rack <Rack Group Name>.*

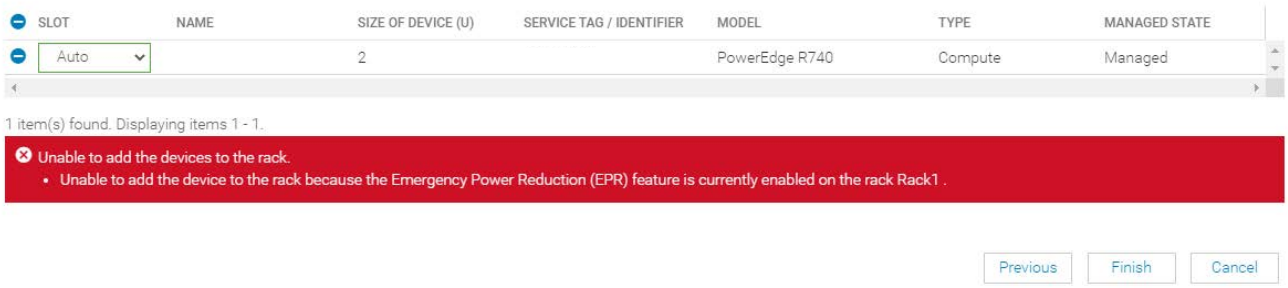

Figure 33 Message displayed on adding devices to a physical group with active EPR.

Recommendation:

Disable the EPR applied on the physical group and retry the operation.

Note: Addition of both, Power Manager supported, and unsupported devices are restricted when there is an active EPR applied on the physical group.

Can I rearrange devices in a Rack physical group with active EPR applied from Power Manager?

Description:

You can modify the rack slot(s) of selected device(s) **(Manage Rack > Rearrange Rack > Update Rack Slots)** even if there is an active EPR applied on the Rack physical group.

Can I edit the attributes of a Static or Physical Group with active EPR?

Description:

You can monitor attributes of a Power Manager static or physical group even if there is an active EPR applied at a group level.

Can I move device from a Rack physical group with active EPR to another Rack group in same or different physical hierarchy?

Description:

There are two use cases to be considered in this scenario:

- Movement of device(s) from a physical group (Rack1) with or without EPR to another group (Rack2) with active EPR.
  - Movement of devices from a physical group (Rack1) with or without EPR, to another physical group (Rack2) with EPR is restricted with a message as *Unable to add the device to the rack because the Emergency Power Reduction (EPR) feature is currently enabled on the rack <Group Name of Rack 2>.*

    Recommendation:

    Disable EPR applied on the physical group (Rack2) and retry the operation.
- Movement of device(s) from a physical group (Rack1) with EPR to another group (Rack2) without EPR.
  - Movement of device(s) is successful from a group (Rack1) with active EPR, if the target group (Rack2) does not have any EPR in active state. While movement of device to Rack2 without EPR, the EPR applied by virtue of Rack1 is removed automatically by Power Manager. Corresponding audit log entries are available in **Monitor > Audit Logs** tab as follows.
    Message ID—CPWR0027, Severity—Info, Category—Configuration

    Message—The Emergency Power Reduction feature is successfully disabled on the target <Device Name>.

Can I remove devices from a Rack physical group with active EPR?

Description:

You can remove devices from a Rack physical group with an active EPR. After you remove the devices, the EPR applied by virtue of Rack1 is removed automatically by Power Manager. The listed EPR is removed from **Power Management > Emergency Power Reduction** tab when all devices are removed from the physical group with active EPR.

Corresponding audit log entries are available in **Monitor > Audit Logs** tab as follows.

Message ID—CPWR0027, Severity—Info, Category—Configuration

Message—The Emergency Power Reduction feature is successfully disabled on the target <Device Name>.

Note: Behavior is the same even if there is an EPR effective on a Rack physical group (child) by virtue of the EPR applied in any parent groups as Datacenter, Room or Aisle.

Can I add a Power Manager monitored device with active EPR (applied in individual device level) into a static group monitored in Power Manager?

Description:

You can add a monitored device with an active EPR to a static group. To add the device, perform the following steps:

1. Discover and add a device (Device1) into Power Manager and apply an EPR on device level (from **Device Details > Power Management and Monitoring > Policies and EPR** tab).
2. Create a static group in OpenManage Enterprise **(Devices > Custom Groups > Static Groups)** and add the group in Power Manager. There is no EPR applied on Static Groups.
3. Add the device (Device1) with Active EPR into the Static Group monitored in Power Manager.

Results:

The device is added successfully to the Static Group. EPR applied on the device is maintained even when the device is added or removed from a static group monitored in Power Manager.

Can I add a Power Manager monitored device (without EPR) into a static group monitored in Power Manager with active EPR applied at group level? Will the EPR applied in group level be automatically imposed on the device after adding it to the static group?

Description:

If you add a device (without EPR) to a new group having an active EPR, the EPR is not applied on the new device. For example, consider the following scenario:

1. Discover and add few Power Manager capable devices (Device1, Device2) into Power Manager.
2. Create a Static Group in OpenManage Enterprise (Devices > Custom Groups > Static Groups) and add the group in Power Manager (Power Management > Devices and Groups > Groups).
3. Add Device1 into the Static Group and apply an EPR on group level (Devices > Static Groups > Group Name > Group Details > Policies and EPR).
4. Add Device2 (Without EPR) to the Static Group with active EPR.

Results:

Addition of Device2 is successful to the static group. EPR applied in Group level is effective on Device1 but does not have any effect on Device2 that is added later.

What happens to the EPR applied on individual device level (EPR1) when the same device is added to a static group monitored in Power Manager and another EPR (EPR 2) is already applied or applied later on group level?

Description:

EPR applied at group level is not effective on the device, when the added device already has an EPR applied on it.

For example, consider the following scenario:

1. Add two Power Manager capable devices (Device1, Device2) into Power Manager.
2. Create a Static Group (SG1) with Device2 in OpenManage Enterprise and add the group in Power Manager Monitoring List**.**
3. Apply EPR1 on Device1.
4. Apply EPR2 on the Static Group (SG1) with Device2. EPR is applied on Device2.
5. Add Device1 with an active EPR (EPR1) to the Static Group with active EPR2.

Results:

Addition of Device2 is successful to the Custom Group. EPR2 applied in Group level is effective on Device2, whereas the EPR1 is in control of Device1. Same is the behavior even if EPR is applied later to the Static Group (SG1) after adding Device1 with EPR1.

What happens when a device with EPR Throttle (EPR1) applied is added to a static group and later an EPR Shutdown (EPR2) is applied on the static group?

Description:

EPR applied on group level is not effective on the device when the device added to the static group already has an active EPR.

For example, consider the following scenario:

1. Discover and add two Power Manager capable devices (Device1, Device2) into Power Manager.
2. Create a Static Group (SG1) with Device2 in OpenManage Enterprise and add the group in Power Manager**.**
3. Apply EPR Throttle (EPR1) on Device1.
4. Add Device1 with an active EPR Throttle (EPR1) to the Static Group. The group now contains Device1 and Device2.
5. Apply EPR Shutdown (EPR2) on the Static Group (SG1).

Results:

EPR2 (EPR Shutdown) applied on group level is applied only on Device2. EPR shutdown action will fail in Device1 with following audit log entry:

Message ID—CPWR0023, Severity—Warning, Category—Configuration

Unable to enable the Emergency Power Reduction feature on the target <Device1> because the feature is already enabled on the target.

What happens when an EPR is applied on a static or physical group, but all the member devices have EPR applied individually (from Power Management and Monitoring > Policies and EPR page)?

Description:

For example, consider the following scenario:

1. Discover and add two Power Manager capable devices (Device1, Device2) into Power Manager.
2. Apply EPR1 on Device1 and EPR2 on Device2.
3. Create a Static or Physical Group and add both devices with active EPR's to the group.
4. Add the Static Group into Power Manager and try applying an EPR on the Static Group (from **Group Details > Policies and EPR** tab).

Results:

The attempted EPR action on Static or Physical Group fails with the following message since all the member devices have EPR applied individually from Power Manager.

EPR action failed.

Message ID—CPWR0049 —The Emergency Power Reduction feature cannot be enabled on the group <Group Name> because either the member devices of the group cannot be accessed, do not have necessary license, or the Emergency Power Reduction (EPR) feature is already enabled.

What happens when I disable EPR on a device (iDRAC, CMC or MSM) directly, after configuring the same from Power Manager?

Description:

In this case, there is a mismatch between the EPR details displayed in Power Manager when compared to the actual EPR status in device level.

Recommendation:

It is recommended to apply or disable EPR on devices only through one management console since EPR (Throttle or Shutdown) actions from multiple Power Manager instances, REST interfaces or iDRAC, CMC, MCM, MSM consoles can affect the parity of data between devices and management consoles.

Does EPR applied by virtue of a static group be removed from a member device, when the device is removed from the static group (with active EPR) monitored in Power Manager?

Description:

EPR applied by virtue of a Static Group is maintained in the device even when the device is removed from a Static Group with an active EPR.

Resolution:

To disable EPR after removing the device from Power Manager, go to the iDRAC, CMC or MCM console of the target device and remove the EPR.

What happens to the EPR applied on a static group, when all devices are removed from a static group with active EPR?

Description:

EPR is maintained on device level when all devices are removed from a Static Group with active EPR. EPR applied on Static Group is listed in **Power Management > Emergency Power Reduction** tab and a red banner indicating EPR status and EPR Source is displayed in **Group Details > Policies and EPR** page of the Static Group.

Resolution:

To disable the EPR applied on the device, go to the iDRAC, CMC or MCM console of the device and remove the EPR.

You can disable EPR in Power Manager from **Power Management > Emergency Power Reduction** tab.

What happens to the EPR applied for a static group, when the static group is deleted from OpenManage Enterprise?

Description:

EPR is maintained in the device when a Power Manager monitored Static Group is deleted from OpenManage Enterprise. EPR applied on Static Group is automatically removed from **Power Management > Emergency Power Reduction** tab.

Resolution:

To disable EPR on the device, go to the iDRAC, CMC or MCM console of the target device and remove the EPR.

Can I delete a physical group with an active EPR from OpenManage Enterprise (Devices > Extension Groups > Physical Hierarchy)?

Description:

Delete action is restricted on physical groups with active EPR.

Note: Behavior is the same even if there is an EPR effective on a Rack physical group (child) by virtue of the EPR applied in any parent groups as Datacenter, Room or Aisle.

Result:

The deletion task fails with the following error message:

Failed to delete physical group.

CPWR0073—Unable to complete the operation because the Emergency Power Reduction (EPR) feature is enabled on the group <Group Name>.

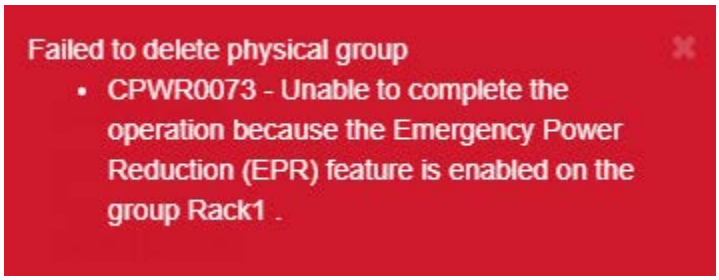

Figure 34 Message displayed on deleting physical groups with active EPR

Resolution:

Disable EPR applied on the physical group and retry the operation.

What happens when a device with active EPR is excluded or deleted from OpenManage Enterprise?

Description:

EPR is maintained in the device when a Power Manager monitored device is deleted or excluded from OpenManage Enterprise. EPR applied on the device is automatically removed from Power Management > Emergency Power Reduction tab.

Resolution:

To disable EPR on a target device, go to the iDRAC, CMC or MCM console of the device and remove the EPR.

What happens to the Temperature-Triggered EPR applied on a static or physical group, when all devices are removed from a monitored group with active Temperature-Triggered Policy?

Description:

The Temperature-Triggered policy and EPR applied on a monitored group (Static or Physical) is removed automatically from Power Manager (in **Power Management > Policies** and **Power Management > Emergency Power Reduction** tabs) when all the devices are removed from the monitored static or physical group.

The EPR Throttle applied by virtue of Temperature-Triggered policy is automatically removed from the target devices also.

Why is Throttle option not displayed after clicking Apply EPR from Power Management and Monitoring > Policies and EPR tab for a monitored PowerEdge server?

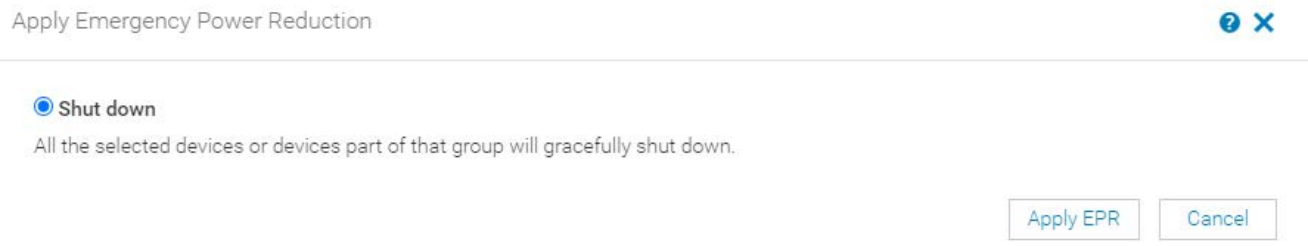

Figure 35 Only Shut Down option is displayed after clicking Apply EPR for a device

Resolution:

EPR Throttle option is not available when the monitored device does not have a valid iDRAC Enterprise or Data Center License installed. Configuration of static power policies and Temperature-Triggered EPR is also restricted without the iDRAC Enterprise or Data Center license.

Why is Apply EPR option not displayed in Power Management and Monitoring > Policies and EPR tab for a monitored PowerEdge FX2/FX2s or VRTX chassis?

Description:

After logging in with administrator privileges, **Apply EPR** option is not displayed for the chassis in **Power Management and Monitoring > Policies and EPR** tab if the discovered FX2, FX2s or VRTX chassis do not have a valid Enterprise license.

Note: **Apply EPR** option is greyed out for all devices and groups when logged in as a Viewer from OpenManage Enterprise. In case you have logged in with Device Manager privileges, Apply EPR option is available for devices but greyed out for monitored Static Groups.

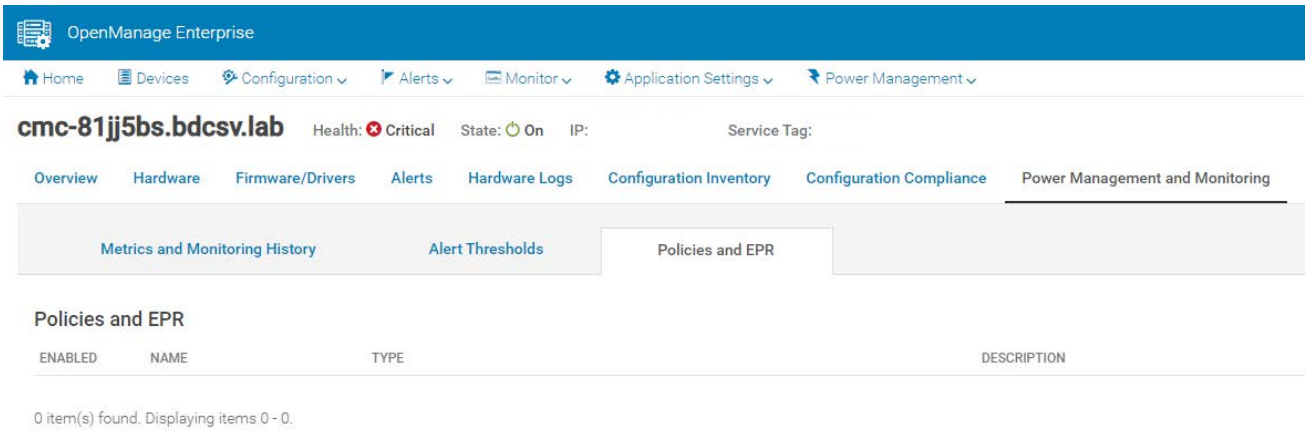

Figure 36 Apply EPR option not available for Chassis with Express License.

Can I apply EPR (Throttle) on an MX7000 chassis which is configured as a member in MCM mode?

Description:

EPR Throttle option is not available from Devices > Power Management and Monitoring > Policies and EPR tab and hence cannot be enabled directly on a MX7000 chassis which is added as a member in MCM group.

Meanwhile, EPR throttle can be enabled on a Lead MX7000 chassis and the same power configuration is replicated on the member MX7000 chassis based on the propogation rules configured for Power attribute in MSM console.

Note: EPR (Throttle) applied on Lead MX7000 chassis is not replicated on the member MX7000 chassis if Power attribute is not selected in the propogation rules configured for MCM group.

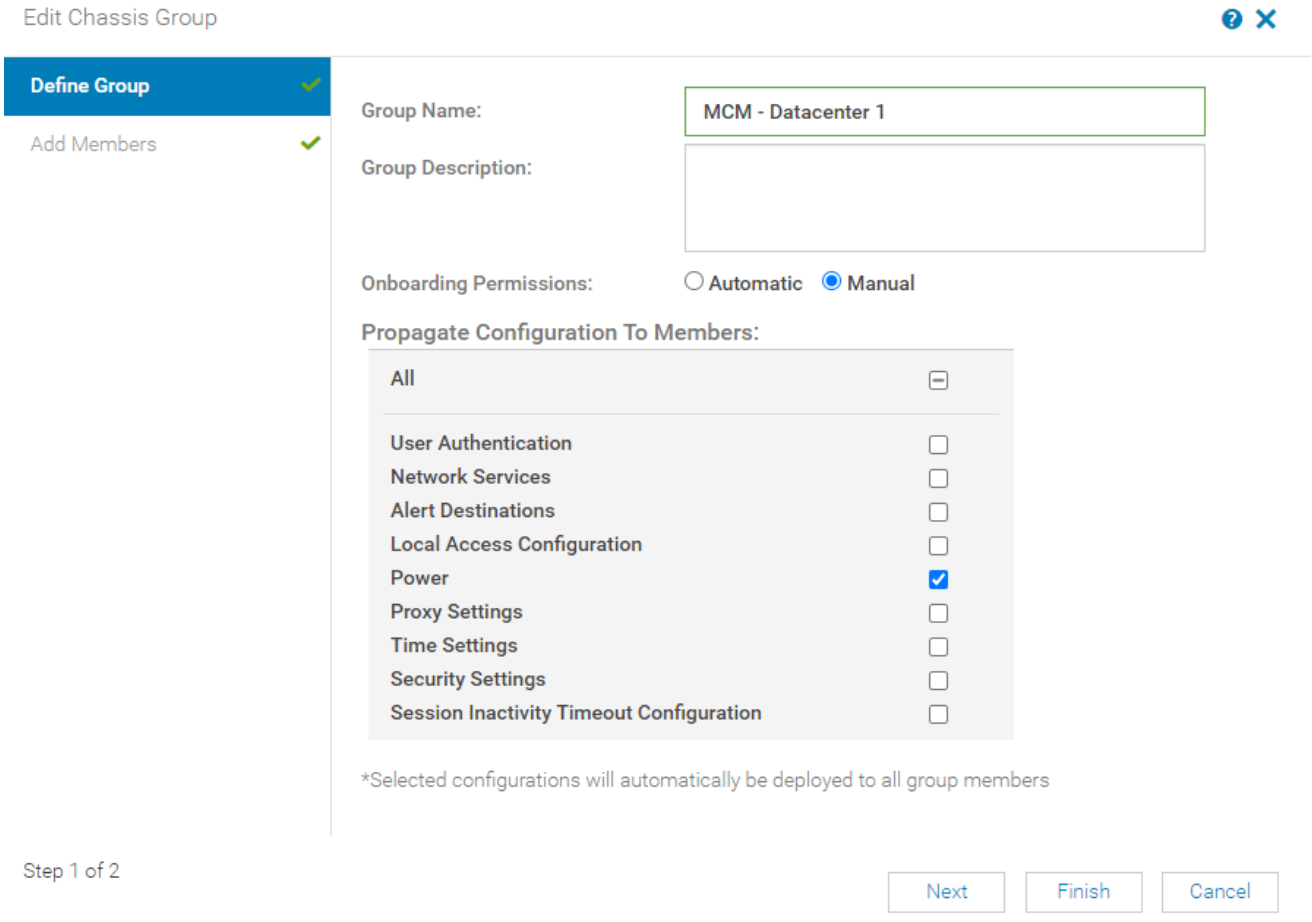

Figure 37 Select configurations in MSM which needs to be deployed to all group members

Note: Audit log entries in OpenManage Enterprise is available only for the EPR feature enabled on Lead MX7000 chassis since the propogation of power configuration is managed by MSM.

What happens to the EPR configured on a device when the OpenManage Enterprise Advanced license is expired or deleted?

Description:

If EPR is enabled on a group, and the license is expired or deleted for any device which is part of the group, the device is not removed from Power Manager. EPR remains on the target device. Behavior remains the same when EPR is applied on an Individual device and the license gets expired on the target device.

Note: When the EPR is disabled from Power Manager, the device gets automatically removed from Power Manager.

Are there any restrictions on plugin or appliance actions (Disable, Update, Uninstall) when an EPR is enabled through Power Manager?

Description:

Disable and uninstall of Power Manager is restricted if there is an active EPR (Manual or Temperature-Triggered) on a monitored device or group. However, Power Manager update is successful even with active EPR's.

Figure 38 Message displayed on disabling or uninstalling Power Manager with active EPR

Resolution:

Disable EPR and then retry uninstalling or disabling Power Manager.

Note: With active EPRs applied from Power Manager, OpenManage Enterprise upgrade is successful and the EPR is maintained in the same state post update.

8 Technical Support and Resources

- Dell.com/support is focused on meeting customer needs with proven services and support.
- To watch quick and short videos about handling the PowerEdge server components, visit the QRL video website.
- Storage technical documents and videos provide expertise that helps to ensure customer success on Dell EMC storage platforms.

8.1 Related Resources

- Knowledge Base for Dell EMC OpenManage Enterprise HTML
- Knowledge Base for Dell EMC OpenManage Enterprise Power Manager and Power Center HTML
- Dell EMC OpenManage Enterprise Power Manager Version 1.2 User's Guide PDF HTML
- Dell EMC OpenManage Enterprise Power Manager RESTful API Guide version 1.2 PDF HTML
- Dell EMC OpenManage Enterprise Power Manager 1.2 Release Notes PDF HTML