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Getting Started

Getting Started: Overview

Intel® DCM Console is a power and temperature management solution for the data center. It enables you to monitor and manage power consumption and temperature in your data center through the management console.

See Also

Dashboard
Groups
Device Management
Datacenter Management
Summary
Energy Optimization
Power Policies
Events and Thresholds
Emergency Power Reduction
Settings

Software Requirements

Intel® DCM Console has been validated on the following operating systems:

- Microsoft Windows 2003 Standard/Enterprise/Small Business Server SP1 (x86, x64)
- Microsoft Windows 2008 Standard/Enterprise/Datacenter (x86, x64)
- Microsoft Windows 2008 R2
- Microsoft Windows 7
- Microsoft Windows Vista (x86, x64)

Hardware Requirements
DCM Console User Guide

For best performance, install the Intel® DCM Console on a system with at least:

- A dual-core processor of 2.6GHz or higher
- 8 GB RAM
- 80 GB of hard drive space

Installing DCM Console

Navigate to the directory containing the installation package, and double-click the package to launch the installation program.

Click Next.
Getting Started

Choose I accept the terms in the license agreement, and then click Next.

Fill in the User Name and Organization fields, choose whether to install for all users or only the current user, and then click Next.
Choose whether you want to install the optional components, **Reference UI** (reference user interface) and **Samples** (sample code), or click **Next** directly (recommended in the step).
For ease of trouble-shooting while installing and running the product, we recommend that you use the default installation path and click **Next** directly. If you want to change the location to install, click **Change**.
If you clicked **Change** in the previous step, you can browse through the drop-down list or type the exact path in the text box. Click **OK** to return to the previous window, then click **Next** to continue the installation.
Choose the port for SNMP traps, and then click **Next** (recommended). If you need to change the **RMI Port**, click the check box first and then configure the port number on the right side.
NOTE

Generally, each of the ports has a default value during installation and configuration. You need to make sure that other processes do not occupy the port you’re setting before you change the value.

You may choose to enable TLS and configure the TLS port by clicking the check box and configuring the port number on the right side. You may also use another HTTP port number for the web service interface.
Configure the Sampling Frequency and Data Granularity settings, then click Next.
NOTE

The **Sampling Frequency** is the time interval between power and thermal measurements that DCM collects from the devices managed. The default value is 60 seconds, and you need to make sure that the device supports the sampling frequency you set.

The **Data Granularity** is the resolution of power/thermal data measurements that are stored in DCM database for query/metric usages. Valid measurement data granularity includes 30, 60, 180, 360, 600, 1800, and 3600 seconds, and it must be a multiple of the **Sampling Frequency**.

Then configure **User Name** and **Password** for login, and click **Next**.
NOTE

Special characters are not recommended in a password.

Enter **TLS Keystore Password**, which will be used to access the keystore file. Then enter the corresponding information for the certificate, and click **Next**.
In the form, you need to complete the database settings, including **User Name**, **PostgreSQL Port**, **User Password**, and the directory of the database. The default value of **PostgreSQL Port** is 6443. If another process is already using that default port, enter a different one. Then click **Next**.
On the **Ready to Install the Program** page, click **Back** if you want to change the installation settings, or click **Install** to begin the installation process.
Once you click **Install**, you will see a status screen that notes the progress.
After clicking **Finish**, DCM Console has been installed successfully.
Launching DCM Console

There are two ways to launch DCM Console.

1. By typing the URL directly in address bar of browsers.

   Enter the following default address in your web browser to launch the DCM Console:
   
   http://localhost:8688/DcmConsole/

   We suggest using Firefox as the web browser, since some functions of the console may not work properly in other browsers.

   Enter the **User Name** and **Password** you configured during installation to log in.
The Dashboard provides an overview of data center power and temperature status.

**NOTE**

The letters of 'D' and 'C' in default address are always capital.

2. By clicking the shortcut in the Start menu.
   - Click Start—All Programs.
   - Find the Intel Datacenter Manager folder.
   - Click on Datacenter Manager Console.

**Comment [AG]:** This is the correct way to represent this, but does it match what’s onscreen?
License

DCM Console can be used at no charge for 90 days. You can click **About** on the top right of the interface to check license **Status** and **Expire Date**.

![License Information](image)

If a new license is not imported after the expiration date, the **Status** changes from **Valid** to **Expired**. DCM Console stops working, and any operation in DCM Console will lead to an **Invalid license** notice.
If you want to continue using DCM Console after the expiration date, you can request a license from Intel Corporation to extend your use period.

To request a license:

- Click **About** on the top right of the interface.
- Copy your **Request ID** in the popup dialog and email it to **dcmsales@intel.com**.
- Contact Intel Corporation to sign an agreement and complete payment correctly.
- Obtain license from Intel.
To import new license:

- Click **About**.
- Click **Import new license** in the popup dialog.
- Select license (dcm.lic) and then click **Open**.
Then your Status changes to Valid and the Expire Date is extended automatically.
License Information

Status: Valid
Expiration Date: 2013-02-28

To request a license, please contact Intel(R) Data Center Manager support by email to dcm-sales@intel.com. You need to provide Request ID to obtain the license.

Request ID: E9CE49F375FCAB51D41C2BA102AC25F100C40

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Using DCM Console

Dashboard

Dashboard: Overview

The Dashboard page displays the overall status of your data center, including temperature/power status, energy/space usage, and partial events.

The Dashboard page is available in two ways: the traditional form and the new form with optional gadgets.

The Dashboard page is introduced in the traditional form in this chapter. The last section of this chapter introduces how to use the new form.

See Also

Temperature/Power

Capacity

Events

The New Dashboard

Temperature/Power

The Temperature/Power tab displays overall temperature status that DCM Console monitors.
The temperature clock shows the current highest temperature for all the devices managed by DCM Console:

- The pointer will position in the blue area when the highest temperature is below 27 degrees.
- The pointer will position in the orange area when it is above 27 degrees.

Hourly trending of the highest temperature during the previous 24 hours is displayed in the temperature trending chart. The top 3 high temperature rooms are listed below with the icons in orange/blue colors:

- Blue for rooms with highest temperature below 27 degrees.
- Orange for rooms with the highest temperature above 27 degrees.

You can click on the rooms listed here to check the tool’s cooling analysis on the Energy Optimization page.

The power clock on the right side of the Temperature/Power tab shows the current total IT equipment power. The maximum value of the power clock is the peak power that DCM Console detected in the last month. If the current total power is below 80% of the peak power, the pointer will locate in the blue area. There are also hourly time charts below each relevant dial, which display the temperature status and power trending of the previous 24 hours.
The **Capacity** tab in the **Dashboard** page shows the power/space capacity and usage.

The two bar charts indicate the power and space capacity currently consumed against the power and space capacity unused. The total numbers of rooms, racks, and devices in the DC hierarchy are displayed at the bottom of the tab.

**Events**

The **Events** tab on the **Dashboard** page lists all the critical events and custom events.
See Also

Events: Overview

The New Dashboard
Our new Dashboard provides a new way to visualize your overall DC information. Flexible and friendly, it offers more ways to customize your data, dividing the overall information into different gadgets.

If you’re using the traditional dashboard, you can click the right top corner to enjoy the new dashboard:

You can select which gadgets to display and which to hide by clicking the gear at top of the page:
Using DCM Console

Check the boxes to the left of the gadgets you’re interested in, then click **OK**.

If you would like to revert back to the traditional dashboard, simply clear the checkbox to the left of **Enable Gadgets**.

Groups
Groups: Overview

On the Groups page, the devices you are interested in can be sorted and put into one custom group. You can manage, monitor, and configure the devices in the groups the same way as in the Hierarchy.

See Also

Operation on Groups

Summary/Temperature/Power/Policies/Thresholds

Operations on Groups

1. Adding groups

On the Groups page, click + under Group List to add a group. Specify the name and an optional description in the popup dialog, and then click OK.

You'll see your group added to the Group List.
Using DCM Console

Select a group and click + under **Device Name** to add a device to it. Specify the name and an optional description in the popup dialog, and then click **OK**.

Then devices are added successfully and the IP Addresses and the hierarchical structures are listed in the form.
NOTE

If you want to add all the devices of a given Data Center/Room/Row/Rack to a group, you can check the box for that Data Center/Room/Row/Rack, and then click **OK**.

2. Editing/deleting groups

In the Group List, click **edit** to edit the selected groups and **delete** to delete groups.

In the Device list, click **delete** to delete devices.

Summary/Temperature/Power/Policies/Thresholds

These four tabs are similar to that of **Datacenter Management** page.

See Also

Summary

Temperature/Power

Policies

Thresholds

Device Management

Device Management: Overview

The **Device List** page contains all the devices discovered, imported, and manually added.

On this page, you can edit the device information to change the **Name, Description**, etc. You can also delete a device from the list, or apply a filter to show only specific devices.
Discovering Devices

Click **Submit Task** in the **Discovery** page.

Select the protocol type from the drop-down list, and input the **IP range**. The default **Subnet Mask** is 255.255.255.0. You may provide some additional information based on the **Protocol** type you choose.
Choose from 6 protocol types available in the drop-down list: IPMI, SNMPv1v2c, SNMPv3, WS-MAN, SSH, and INBAND_PROTOCOL.

**NOTE**

The first two bytes of the **First Address** and the **Last Address** must be the same.

Click **OK** to run the discovery task.
After the discovery progress reaches 100%, you may restart/remove the task by clicking **Run Again/Remove**.

The devices discovered will be added to the **Device List** automatically.
Adding a Device Manually

Click **Add** to add a new device to the Device List.

Eight device types are now available in the drop-down list: Server, PDU, UPS, Network device, Chassis, Unmanaged server, Unmanaged network device, and Unmanaged storage device.
Specify **Name** and **IP Address** or **Hostname** of the new device in the popup dialog. You may also need to provide some additional information based on the **Device Type** you selected. For servers managed via the IPMI protocol, you may specify in-band OS information to retrieve CPU utilization data, along with the power and temperature data.

For example, if you chose **Server** as the **Device Type**, you have to choose a protocol from IPMI, SSH, and WMI, then type in the related information.
Click **OK** and you will see a new device successfully added to the device list.
Using DCM Console

- You need to enter either the **IP Address** or the **Hostname**, but not both.
- If you choose **Server** as the device type and **SSH** or **WMI** as the protocol, DCM will login the OS with the username and password. Then DCM gets workload information from the OS to estimate power consumption dynamically.
- For **Network Device**, DCM supports Cisco switches with Cisco EnergyWise technology enabled.

**PDU Configuration**

If you add a PDU with outlet level power monitoring capability, you can specify unmanaged devices as associate devices. By doing this, you can get the power information of the devices without power monitoring capability from the PDU outlet power.

Click the **Associate Device** link on the **Device** tab of the PDU summary page. Click the drop-down list and choose an unmanaged device for the corresponding outlet. Then click **OK**.

![Associate Device to PDU Outlet](image)

**See Also**
Adding an Unmanaged Device

If you choose Unmanaged server, Unmanaged network device, or Unmanaged storage device as the device type, DCM will specify Power Estimator(s) for the device(s) because these unmanaged devices do not have power monitoring capabilities. You can assign parameters to the estimator by specifying typical power or looking up the power profile.

To look it up go to the Datacenter Management page, select the Hierarchy tab, then add the unmanaged device to a rack and select the device.

Click the Edit link on the Summary tab and a popup dialog box appears. Then you can select the device from the list and DCM will fill in the peak power and active idle power automatically according to the device selected. Click OK to finish configuring Power Estimator.
If your device is not in the list, or you know the typical power of your device, you can:

- Fill in the **peak power** and **active idle power** blanks directly.
- Click **Add** in the popup dialog to add a power profile:

Select from 3 types of power profiles available in the drop-down list: **Server**, **Network Device**, and **Storage Device**.
You can **Edit** or **Delete** a power profile by clicking the corresponding button:

You can also check, edit and delete all the power profiles on the **Power Profile** tab of the **Settings** page.

**NOTE**

- After adding an unmanaged device into a rack, an event will appear in the Events list to remind you to specify a power estimator for it.
- You can configure the Power Estimator for devices of the same type in batches:
If you have specified an unmanaged device for a PDU, you can see the information for the PDU on the last line of the Device list. For example, the screenshot below shows that you can get its power information from Outlet1 of PDU with an IP address of 10.239.98.30. You can click the **Clear** link to disassociate this information.

### See Also

- **PDU Configuration**
- **Power Profile**
- **Importing Devices**
Click the Import button on the Devices tab of the Devices and Racks page to import a list of devices with hierarchy information. This information must be contained in a Microsoft Excel document that's formatted as in the figure below.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>Entity display name</td>
</tr>
<tr>
<td>type</td>
<td>Supported protocol types include IPMI, SNMPv1v2c, SNMPv3, WS_MAN, SSH, and INBAND_PROTOCOL. For unmanaged device, it should be &quot;Unmanaged server&quot;, &quot;Unmanaged network device&quot;, or &quot;Unmanaged storage device&quot;.</td>
</tr>
<tr>
<td>address</td>
<td>IP address</td>
</tr>
<tr>
<td>username</td>
<td>Username to login</td>
</tr>
<tr>
<td>password</td>
<td>Password to login</td>
</tr>
<tr>
<td>snmpcommunitystring</td>
<td>Community string for accessing the SNMP-based platform via V1</td>
</tr>
<tr>
<td>snmpencryptionpassword</td>
<td>The SNMP-based platform user account password for encryption</td>
</tr>
<tr>
<td><strong>httpsport</strong></td>
<td>The HTTPS port for the entity</td>
</tr>
<tr>
<td>---------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td><strong>sshport</strong></td>
<td>The SSH port for the entity</td>
</tr>
<tr>
<td><strong>distinguishedname</strong></td>
<td>The UCS DN of the entity (used for identifying and discriminating UCS devices in DCM)</td>
</tr>
<tr>
<td><strong>key</strong></td>
<td>The IPMI key for the node</td>
</tr>
<tr>
<td><strong>deratedpower</strong></td>
<td>De-rated power for both managed and unmanaged nodes</td>
</tr>
<tr>
<td><strong>dc</strong></td>
<td>Data center</td>
</tr>
<tr>
<td><strong>room</strong></td>
<td>A physical group that includes all rows in a physical room in the data center</td>
</tr>
<tr>
<td><strong>rack</strong></td>
<td>A physical group that includes all nodes in a physical rack in the physical data center.</td>
</tr>
<tr>
<td><strong>row</strong></td>
<td>A physical group that includes all racks in a physical row in the physical data center.</td>
</tr>
<tr>
<td><strong>enclosure</strong></td>
<td>An enclosure to contain blade servers</td>
</tr>
<tr>
<td><strong>size</strong></td>
<td>Size of the entity</td>
</tr>
<tr>
<td><strong>location</strong></td>
<td>Location of the physical entity</td>
</tr>
</tbody>
</table>

Click **Import**, choose the Excel document, and then click **Open**.
The devices in your Excel spreadsheet are now imported into the **Device List**.
You can also view the hierarchy imported on the Datacenter Management page.

Filtering Devices

You can apply a filter to show only specific devices:

- Go to the Devices tab on Devices and Racks page.
Specify device name/address (partial or full).

Click **Search**.

Click **Clear** to clear the filtering text box.

**Editing a Device**

Click **Edit** to edit a device. Select the devices you want to edit, and then click **OK**.
You can change the name and optional information of the devices being edited.
IP Address/Hostname, Device Type, and Protocol information are based on device configuration, which cannot be changed arbitrarily.

Deleting Devices

To delete a single device or multiple devices:

- Go to the Devices tab on the Devices and Racks page.
- Click Delete.
- Select the check boxes to specify which devices to delete.
- Click OK.

Datacenter Management

Datacenter Management: Overview

Datacenter Management displays all managed entities in DCM Console. You can configure several entities (not including the data center) as a group for your management.
DCM Console manages entities with the following group structure:

Data Center > Room > Row > Rack > Device > Blade

Blade level is only available for HP and DELL enclosure.

When you are creating a hierarchy:

- A room can only be added to a data center.
- A row can only be added to a room.
- A rack can only be added to a row.
- A device can only be added to a rack.

See Also

Adding Groups
Adding Devices
Hierarchy Management

Adding Groups

On the Datacenter Management page, click + in the Data Center list to add a DC. Specify the name in the popup dialog, and then click OK.
A DC is added successfully.

Select a DC and click + in the Room list to add a room to it. Specify the name of the room in the popup dialog, and then click OK.

Similarly, you may add rows to a room.
Using DCM Console

Select a row and click + in the **Rack** list to add a rack to it. Specify the name of the rack in the popup dialog, configure the space capacity and total power capacity, check the box "**PDU Power as Rack Power**" if you want to use the power reading of PDU(s) in the rack as the IT equipment power of the rack, and click **OK** to add the rack.

![Add Rack dialog](image)

**NOTE**

**Name** and **Total Power Capacity** are mandatory when adding a rack.

**Adding Devices**

Select a rack and click + in the **Device** list.

![Device hierarchy](image)

The popup dialog shows all the ungrouped devices that do not exist in the current hierarchy. Select the devices you want to add to the rack, and then click **OK**.
Devices are grouped successfully as shown in the following figure.

Click the name of the device in the **Device List** page, and then you can go to the **Hierarchy** page of the selected device directly.
You may also add a new device to a rack by navigating to the **Add New Device** tab in the popup dialog, and specifying the information of the device as described in [Adding a Device Manually](#).

![Add Device](image)

**NOTE**

If you do not specify **Size of Device** and **Derated Power**, default values (1 for **Size of Device** and 400 for **Derated Power**) are set for the server after you click **OK**. Default values for different device types are different.
Hierarchy Management

In the Hierarchy tab on the Datacenter Management page, each entity can be edited or deleted (recursively with the sub-groups and devices) using the Edit icon or the Delete icon.

To edit an entity:
- Select the entity.
- Click the Edit icon in the list.
- Edit its information.
- Click OK.

To delete one or more entities:
- Select the entity/entities.
- Click the Delete icon in the list.

You may also click the Move icon to change the hierarchy:
- Select the entity/entities.
- Click the Move icon in the list.
- In the popup dialog, select the group as the destination.
- Click OK.
After the previous steps, the devices selected have been moved to the destination group. You may move rooms/rows/racks similarly.
NOTE

You can refer to the Hierarchy tab by clicking the hyperlinks on entities. Almost all the entities are equipped with hyperlinks to the Hierarchy tab.

Search for Available Racks

You may specify device information to search for racks to install the device.

Go to the Racks tab on the Devices and Racks page. Type in the appropriate values for Device Size and Device Derated Power, and then click Search.

Then the racks matching your requirements will be listed below.

Summary
Summary: Overview

The Summary tab on the Datacenter Management page displays detailed information about each entity, including temperature, power, space and events, etc.

See Also
Summary of a DC
Summary of a Room
Summary of a Row
Summary of a Rack
Summary of a Device

Summary of a DC
The **Summary** tab of the DC selected on the **Datacenter Management** page displays the following information:

- Highest inlet temperature
- The power capacity currently consumed against the power unused
- The space capacity currently consumed against the space unused
- The total numbers of racks and devices in the DC

In most of the cases, the thermometer in the **Temperature** graph is shown in green.

The pie charts in the **Power** and **Space** graphs show the power and space capacity of the data center selected. The unused capacity is plotted in green and the capacity in use is plotted in orange.

The **Events** tab lists all the events for the DC.

> **NOTE**

The thermometer in the **Temperature** graph may turn red if the **Highest Inlet Temperature** becomes higher than 27 degrees.

The pie charts in the **Power** and **Space** graphs may turn red if the amount in use is greater than the capacity configured.

**See Also**

**Events: Overview**

**Summary of a Room**

The **Summary** tab of the room selected on the **Datacenter Management** page displays the information below:

- Highest inlet temperature
- The power capacity currently consumed against the power unused
- The space capacity currently consumed against the space unused
- The total numbers of racks and devices in the room

**The Summary** of a room is similar to the **Summary** of a DC.

The **Events** tab lists all the events for the room.
See Also

Summary of a DC

Summary of a Row

The Summary tab of the row selected on the Datacenter Management page displays the information below:

- Highest inlet temperature
- The power capacity currently consumed against the power unused
- The space capacity currently consumed against the space unused
- The total numbers of racks and devices in the row

The Summary of a row is similar to the Summary of a DC.

The Events tab lists all the events for the row.

See Also

Summary of a DC

Summary of a Rack

The Summary tab of the rack selected on the Datacenter Management page displays the information below:

- Highest inlet temperature
- The power capacity currently consumed against the power unused
- The space capacity currently consumed against the space unused
- The total numbers of devices in the rack

The Summary of a rack is similar to the Summary of a DC, while a visualized rack figure is shown and the total number of racks is not listed, as demonstrated in the following figure.
The **Lowest Inlet Temperature** and the **Highest Inlet Temperature** of all the devices in the rack are shown above the rack visualized. Colored rectangles represent the devices in the rack you’ve selected, and rectangles with no colors represent the free space. When the inlet temperature of a device is higher than 27 degrees, the color of the device turns yellow.

When you hover your mouse over a device, the color changes and the details of the selected device are shown.
You can select a device by clicking on the corresponding rectangle in the visualized rack figure, then the information for the selected device will appear across all the tabs. The selected rectangle will be light gray (or yellow if the inlet temperature higher then 27 degrees), while the others will be dark gray.

The Events tab lists all the events for the rack.

See Also

Summary of a DC

Summary of a Device

The Summary tab of the device selected on the Datacenter Management page displays the information below:

- Highest inlet temperature
- Power
- Space
- The details of the device

The Summary of a device is different from that of a group.

- The Temperature graph displays its highest inlet temperature.
- The Power graph shows its current power.
- The Space graph displays the space that it occupies.
The light gray rectangle in the visualized rack highlights the device selected. The dark gray rectangles represent the other devices of the rack and the empty rectangles with no color represent the free space.
The **Events** tab lists all the events for the device.

**NOTE**

To refresh the properties and status of the selected device, you can click **Reconnect** on the Summary tab.
Using DCM Console

See Also

Summary of a Rack
Power/Temperature

Select an entity on the Datacenter Management page and then click the Power/Temperature tab to view its power and temperature details.
Power and temperature data is plotted in the figures with the corresponding data granularities. CPU utilization data will be plotted if in-band OS information is specified for the given server.

In the temperature figure:

- The **Highest Inlet Temperature** is plotted in pink.
- The **Lowest Inlet Temperature** is plotted in green.
- The **Average Inlet Temperature** is plotted in brown.

In the power figure:

- The **Highest Power Consumption** is plotted in red.
Using DCM Console

- The **Lowest Power Consumption** is plotted in cyan (blue-green).
- The **IT Equipment Energy** is plotted in brown.

You can view the power/temperature values by hovering your mouse over the data points in the curves.

By default, the power and temperature figures display the trending data of the recent hour. You can click the arrow buttons “<” and “>” to view the data in the previous and next time window, or switch to display the data in different time windows by clicking the corresponding buttons.

You can save the measurement data in an excel file so that the managers can analyze the data more conveniently. Click the **Export measurement data** link on the top of the **Temperature/Power** tab.

![Temperature/Power tab](image)

Choose the start and end time for data exporting. Then click **OK**.

![Export Measurement Data](image)

**NOTE**

The corresponding data granularity of a different time window size is different, and is explicitly shown in the figures.

The **Power/Temperature** tab also provides energy consumption metrics for the selected entity:
DCM Console User Guide

- **IT Equipment Energy** gives the total energy consumption of all the IT devices.

- **Cooling Energy**, obtained by multiplying **IT Equipment Energy** with a multiplier, estimates the energy consumption for cooling.

- **Energy Consumed (Total)** gives the total energy consumption from the IT devices and the cooling system.

<table>
<thead>
<tr>
<th>Metrics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>kWh</td>
</tr>
<tr>
<td>IT Equipment Energy</td>
<td>0.172</td>
</tr>
<tr>
<td>Cooling Energy</td>
<td>0.172</td>
</tr>
<tr>
<td>Energy Consumed (Total)</td>
<td>0.344</td>
</tr>
</tbody>
</table>

**NOTE**

After a policy is enforced on the entity selected, **Requested Power Cap** is plotted in purple in the power trending graph.

**See Also**

- Policies: Overview

**Power Policies**

**Policies: Overview**

You can use policies to limit the amount of power that an entity consumes. Each policy applies to one entity, either a group or a device.

DCM Console provides several policy types:

- **Custom Power Limit** limits the total power consumption of an entity. When the policy applies to a group, DCM Console actively reallocates the power budgets to the individual servers within the group in each monitoring cycle. It attempts to minimize the gap between the power demands of each entity and the overall power allocation for the group, in order to minimize the
Using DCM Console

performance impact of the group power capping. DCM Console monitors the power consumption data of the servers, estimates the power demand of the servers, and reallocates the power budgets with a sophisticated approach by applying a heuristic discriminative approach to solve a probabilistic model. In general, DCM Console reacts quickly by allocating more power to servers to get new tasks running properly. If the total power demand of the group exceeds the group power constraint, DCM Console implements a balanced power allocation. The policies are commonly applied to increase the server density with respect to power or cooling capacity.

- **Minimum Power** throttles power consumption of an entity as much as possible. Use this policy to prolong business continuity in the case of an emergency.

You can go to the Policies page or to the Policies tab on the Datacenter Management page to view the policies.

**Creating a Policy for Device**

On the Datacenter Management page, select a device and click Add in the Policies tab.

In the popup dialog, specify the policy name and select the policy type from the drop-down list:
DCM Console User Guide

- If you choose **Custom Power Limit**, DCM will generate an alert when the actual power consumption is higher than the threshold you configured.
- If you choose **Minimum Power**, DCM throttles the device power to the minimum (so you do not need to specify a threshold).

Navigate to the **Schedule** tab to schedule the policy, and then click **OK**.

You may check the policy in the **Policies** tab or on the **Policies** page.
Using DCM Console

**NOTE**

*Reserve Budget* is used for devices without power capping capability and is discounted from the total power limit.

**Creating a Policy for a Group**

When enforcing a *Custom Power Limit* at the group level, you may configure the priorities of its members. Excess power is distributed to the devices according to their priorities.

For each member, you can choose one of the priority levels:

- Low
- Medium (Default)
- High
- Critical: DCM reserves the de-rated power for this entity.

Priority lists are policy-specific and an entity may have different priorities in different policies. However, during policy calculation, a higher priority of an entity in one policy may override a lower priority set to the same entity in another policy.
You may view all the policies on the Policies page to disable, edit, or delete policies.

Enabling/Disabling Policy

To enable/disable a policy:

- Go to the Policies page or the Policies tab on the Datacenter Management page.
- Click the policy’s Enable/Disable link.
- The Status of the policy turns green/red.

Editing Policies

To edit a policy:

- Go to the Policies page or the Policies tab on the Datacenter Management page.
- Click Edit for the selected policy.
Using DCM Console

- Update policy details in the popup dialog.
- Click OK.

See Also

Creating a Policy for Group
Creating a Policy for Device

Deleting Policies

To delete a policy:

- Go to the Policies page or the Policies tab on the Datacenter Management page.
- Choose the policies to delete by selecting the check boxes.
- Click OK.

Energy Optimization

Energy Optimization: Overview

Energy Optimization analyzes different data to help you optimize the energy efficiency in your DC, including Cooling Analysis, Server Utilization Analysis, and Server Power Characteristics, each with a description below.
 cooling analysis

in the cooling analysis page, the temperature histogram figure for the room selected provides real-time monitoring data of the inlet temperatures. the x-axis shows the temperature values and the y-axis gives the percentages of servers with the corresponding temperature values. sample size shows the number of the devices whose temperature can be monitored in the selected room.

see also

cooling analysis
server utilization analysis
server power characteristics
The current cooling status is evaluated with suggestions given, along with possible actions and the Benefits of taking these actions.

For example, when servers with inlet temperatures higher than 27 degrees are detected, they will be displayed in the Hotspots list.

If you need to refresh the temperature data, click Refresh on the top right.

**Server Energy Utilization Analysis**

On the Energy Optimization page, click Server Utilization Analysis. You will see the screen as displayed in the figure below.
By clicking Analyze, low utilization servers will be identified and listed as potential targets for consolidation to optimize energy efficiency. The time that the analysis was done is shown in the bottom left of the screen.

If there are a large number of servers, utilization analysis may take a long time. You may leave this page and perform other operations while the analysis runs in the background.

The Daily Utilization Pattern tab shows the result of analyzing server utilization patterns based on the historical monitoring data. This can help with server consolidation. For example, if one server is busy at night and idle in the daytime,
while another is busy in the daytime and idle at night, you may consider migrating workload and shutting down one of these 2 servers.

Server Power Characteristics

Click Server Power Characteristics on the Energy Optimization page. You will see the screen displayed in the figure below. The X-axis shows the power values and the Y-axis shows the server model. The power values next to the bars present the power ranges measured for different server models.

For example, 128 – 139 means that, for all Intel Corporation-S5500WB servers managed, the lowest power observed was 128 watt and the highest power observed was 139 watt.

Events and Thresholds

Events and Thresholds: Overview
The **Events and Thresholds** page enables you to view the predefined events or custom events for DC management and all the thresholds of entities. Clicking **Events and Thresholds** on the left side of the interface will bring up the **Events and Thresholds** page, which shows lists of all events and thresholds. The **Events** list can be further filtered by time or severity level, as defined below.

<table>
<thead>
<tr>
<th>Severity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Custom</td>
<td>Associated with all custom events.</td>
</tr>
<tr>
<td>Critical</td>
<td>For errors that may cause DCM to stop working properly.</td>
</tr>
<tr>
<td>Error</td>
<td>For errors on specific nodes, or non-critical errors in Intel(R) DCM.</td>
</tr>
<tr>
<td>Warning</td>
<td>For events that warn that an error may soon occur.</td>
</tr>
<tr>
<td>Information</td>
<td>For events that do not report errors.</td>
</tr>
</tbody>
</table>

**NOTE**

There are different **Events** tabs in DCM console:

- The **Events** page lists all the predefined events and custom events.
- The **Events** tab on the **Dashboard** page only lists the critical events and custom events.
- The **Events** tab in the **Datacenter Management** page lists all the events applying to the specific group or device.

You can specify an e-mail address to receive messages when an event is triggered. Add an e-mail address on the **E-mail Subscription** tab of the **Settings** page.

**See Also**

- **E-mail Subscription**
- **Filtering Events**
- **Deleting Events**
- **Thresholds**

**Filtering Events**
To view specific events, you can filter the events by specified time period or severity level.

To filter events by data range:

- Go to the **Events** page.
- Select **Date Range**.
- Specify start time and end time.
- Click **Search**

To filter events by severity levels:

- Go to the **Events** page.
- Select **Severity**.
- Select one or more severity levels.
- Click **Search**.

Deleting Events
DCM Console User Guide

DCM Console automatically deletes old events if there are more than 20,000 events listed. You can also manually delete events.

To delete events:

- Go to the **Events** page.
- Click **Delete**.
- Choose the event to delete by selecting the check boxes.
- Click **OK**.

To delete all events:

- Go to the **Events** page.
- Click **Delete All**.

### Thresholds

Custom events are triggered when a power or temperature threshold is configured on groups or devices. The **Thresholds** tab in the **Datacenter Management** page manages the event threshold configurations, against which the collected data is compared with (in the unit of Watts for power and Celsius degrees for temperature). An event will be triggered when the **Condition** is met.

Below, we demonstrate how to set a power threshold for **Server - 10.439.43.110**. Configuring temperature thresholds is similar. Click **Datacenter Management**, select **Server - 10.439.43.110**, and select the **Thresholds** tab. Under **Power Thresholds**, click **Edit** in the **IT Equipment Power** event.
Enter the value of **Threshold**, and then click **OK**.

Once the power draw of **Server - 10.439.43.110** increases over the threshold you configured, an event is triggered and listed in **Summary** tab. You can check the details by hovering your mouse over its **Description**.
All the thresholds are listed in the Thresholds tab on the Events and Thresholds page. You can manipulate the thresholds by clicking the link Edit or Clear. Clicking the Entity name will also bring you to the Hierarchy tab on the Datacenter Management page, as indicated in Hierarchy Management.

Emergency Power Reduction

Emergency Power Reduction: Overview

In the event of an emergency, such as a DC-level power failure forcing the DC to run on a backup power supply, you can enable Emergency Power Reduction to throttle the power of the devices down to an extremely low level to prolong the service time.

Also, you can specify the emergency power reduction (EPR) for a device when it is added. You can also modify this EPR action by editing the device if it has been added. So when a room is in emergency power reduction, different devices can be in different states.
Using DCM Console

There are three actions you can choose from the drop-down list: Minimize power consumption, Shut down and No action. You can choose No action for very critical devices, but Minimize power consumption or even Shutdown for others.

<table>
<thead>
<tr>
<th>EPR Action</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Action</td>
<td></td>
</tr>
<tr>
<td>Minimize Power Consumption</td>
<td></td>
</tr>
<tr>
<td>Shutdown</td>
<td></td>
</tr>
<tr>
<td>No Action</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE**

Applying Emergency Power Reduction may throttle the power consumption of the devices down to an extremely low level, or even shut the devices down, which will impact performance. Use this function only in emergencies. Please check the EPR action carefully before applying EPR.

**Enabling EPR**

Click Emergency Power Reduction, choose a data center or a room in the popup dialog, and then click OK.

Click OK in the popup dialog.
All the devices with power capping capability in this group are throttled to the state specified by the manager. You can specify EPR action by editing the devices.
Then an icon for EPR appears on top right of the page.

You can check the device list in EPR by clicking the icon.
Disabling EPR

To disable emergency power reduction, click Emergency Power Reduction, uncheck the specified groups, and then click OK.
Click **OK** in the popup dialog.

**Settings**

**Settings: Overview**
The **Settings** page provides tabs for configuring DCM, including **User Management**, **SNMP Trap** and **Predefined Event**.

**See Also**

[User Management](#)
Password

SNMP Trap

Predefined Event

User Management

On the User Management tab, you can create, edit, or delete users. You can also assign users to either the administrator role or a guest role. A user assigned the guest role does not have permissions to modify anything in DCM.

Password

On the Password tab, you can change your login password once you fill in the correct old password.

To change the login password:
  - Go to the Settings page.
  - Fill in the old password.
  - Fill in the new password.
  - Confirm the new password.
  - Click Save.

SNMP Trap

In the SNMP Trap tab you can assign a recipient to receive the events triggered, making it easier to manage the events in 3rd-party event management systems. DCM events are defined in the Management Information Base (MIB) file. And the MIB file is installed at "<installation path>\Intel\DatacenterManager\conf\DCMConsole-MIB-V1.mib".

To add a trap receiver:
  - Go to the Settings page.
  - Click Add Receiver.
  - Fill in the Destination IP/Host, Port, and Community Name.
  - Click OK.
Using DCM Console

To edit/delete/test a trap receiver:

- Go to the **Settings** page.
- Click the links **Edit/Delete/Test** in the **Action** column.

**Predefined Event**

The **Predefined Event** tab integrates all the events predefined by DCM in a form. It includes the **Predefined Event Type** and **Severity** of events. You can select the predefined events you are interested in by checking the corresponding boxes and clicking **Save**.
Power Profile

All the power profiles are listed in **Power Profile** tab on the **Settings** page. You can manage the power profiles conveniently in this tab.

Click the **Add** or **Delete** button to add a new power profile or delete an existing power profile.

Click the **More** link to edit the corresponding power profile:
See Also

Adding an unmanaged device
## Glossary

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMC</td>
<td>Board Management Controller</td>
</tr>
<tr>
<td>DC</td>
<td>Data Center</td>
</tr>
<tr>
<td>DCM</td>
<td>Data Center Manager</td>
</tr>
<tr>
<td>NM</td>
<td>Intelligent Power Node Manager</td>
</tr>
<tr>
<td>PDU</td>
<td>Power Distribution Unit</td>
</tr>
<tr>
<td>RMI</td>
<td>Remote Method Invocation</td>
</tr>
<tr>
<td>RAM</td>
<td>Random Access Memory</td>
</tr>
<tr>
<td>SNMP</td>
<td>Simple Network Management Protocol</td>
</tr>
<tr>
<td>SSH</td>
<td>Secure Shell</td>
</tr>
<tr>
<td>TLS</td>
<td>Transport Layer Security</td>
</tr>
<tr>
<td>UI</td>
<td>User Interface</td>
</tr>
<tr>
<td>UPS</td>
<td>Uninterruptible Power Supply</td>
</tr>
<tr>
<td>UCS</td>
<td>Universal Character Set</td>
</tr>
</tbody>
</table>