



Visual Data Center

3D Client User Guide

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Optimum Path Inc.
Proprietary and Confidential

Optimum Path Inc.

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Chapter 1: Introduction

3D Application Overview

The *3D Client User Guide* provides detailed instructions for implementing and maintaining the application.

The application portal lets you access a wide array of data information from several disparate sources in one consolidated interface. The power of this aggregation is the simplicity it provides to operators to monitor and control both Facilities and IT devices in the data center environment. Since the application is vendor neutral, any device can be included in the interface and monitoring capabilities.

The application provides the following features for data center operators:

- Visual Navigation and Information to multiple floor plans
- Navigation to Main Data Center floor plans or Remote IT closets
- Real-time data metrics related to any device in the system
- Historical trend analysis for metrics defined for devices
- Reporting capabilities for user, device, performance and executive reporting requirements.
- Service Management scheduling and Warranty Tracking
- Integration to third party software solutions. For example, Power Strip controls, IP Camera Systems, Card Access Security Systems, Other Vendor Support and Maintenance portals, third party Monitoring applications, and more are supported.
- Integrated File Depot for document aggregation and management. This feature provides a single location for all data center related As Built drawings, Vendor Contract, Support Agreements, Photos, Policies and Procedures related to your environment.
- Complete Design management of navigation and floor plans. Administrators can assign new devices to floor plans and customize the images and menu links associated with them.
- Full featured Rack Builder. This feature permits administrators to create online graphical representations of their rack layouts. Key information related to devices and racks can then be viewed individually or at the rack level to understand the Weight, Power and physical characteristics of that rack.
- Complete Administrator command of the Access Control Rights of users on the system. Floor plans, Devices and Reports are all controlled by standard User and User Group access rights in the System Administrator area of the application.

Client versus Web

The application provides two interfaces for the user to access with each providing some different functions. In many cases the features overlap, but the 3D Client interface is the interface which provides advanced data analysis and visualization features.

- Location Studio – Build and configure the navigation tree for all locations managed by the application. Create floor plans for assigning devices. Available in both 3D Client and Web Interface.
- Device placement – Assign, remove and relocate devices on floor plans. Available in both 3D Client and Web Interface.
- Device Data Viewing – View all data related to a device including alarms, dashboards, trend charts, service events, port mappings, file depot and more.
- Alarms – View all alarm information for locations and devices.
- Site Summary Data – View summary data related to sites for energy consumption and energy costs based on device performance of devices at that location.
- Port Mapping – Define network and power relationships between devices. Available in both 3D Client and Web Interface.
- Project Wizard – Create work order based device actions and assign tasks to users of the application.
- Network and Power Paths – Create one-line summary of the network, a power tree of a facility, or both. This feature allows logical and physical definitions.
- Capacity Planner – Analyze key capacity metrics related to locations and devices. This tool allows for what if comparisons of actual and modeled device scenarios.
- Root Cause | Impact Analysis – Analyzes the port connections to determine impacts and dependencies for devices connected on the power and network paths.
- Data Control – Manual change of data values or scheduled calendar changes to be automatically changed based on a user defined calendar for changes.
- Security Studio/ Camera Studio – Allows users to configure and manage camera interfaces.
- Reports – View all reports related to device performance and application information. Available in both 3D Client and Web Interface.
- Services – View and manage calendar events and warranty data for all devices in the system.

Chapter 2: 3D Client Interface

How to Access the Client Interface

The application client package is installed on the client computer system. The package provides application files to use for accessing an instance. The following are three ways to access the client interface from a computer on which the application is installed:

- Start Menu – Lets you run the program from the Start Menu.
- Desktop Icon – Lets you run the 3D client by double-clicking this icon. During the client installation process, a desktop icon is added to the user's desktop.
- File Manger – Lets you run the .exe file, which is installed to the following location by default (the final folder will have a version number of the installation package). Note that installers can install this package to a different folder during the installation process.

Login to the Client Application

The login process and login issues for the client are the same as those defined for the web interface. When prompted, you provide a user name and password combination to access the main application interface. During the logon process, you can choose supported language variants from a drop-down list. The same issues and messages appear for the logon and the web-based interface.

Login Profiles

The application lets you create multiple access profiles. This feature lets you access multiple instances from your client by using a single version of the client software. If one or more of the instances are of different versions, you will need to have a different client for each. All clients will access the same Settings file so maintenance of separate Settings files is not needed.

When the client installation is complete, you are prompted to create the default access profile. The profile consists of the URL used to access the interface in the web browser. If new profiles need to be added to the client, you can create them by accessing the Settings application from the Windows Program menu.

When this program is opened, you can click the New button to define a new profile for the client. Enter the URL to be used to access the new instance. The new profile is added to the profile list. Note that these settings are saved to the following windows file:

```
c:\users\[your windows logon name]\appdata\local\VDC\VDC.exe.config
```

If multiple profiles exist on the client, you can select the profile that you want to use to connect when you open the application. If the client can establish a connection to the selected server instance, the logon page appears to let you connect to the system.

Login to Incorrect URL Error Message

When user's login with the incorrect URL, an error message window will indicate that the URL is not correct and the correct URL is provided.

Incorrect URLs include:

- Any URL other than the one designated during installation
- The IP address
- A URL that resolves to the IP address but was not the URL designated during installation

Running the Client in a Citrix Environment

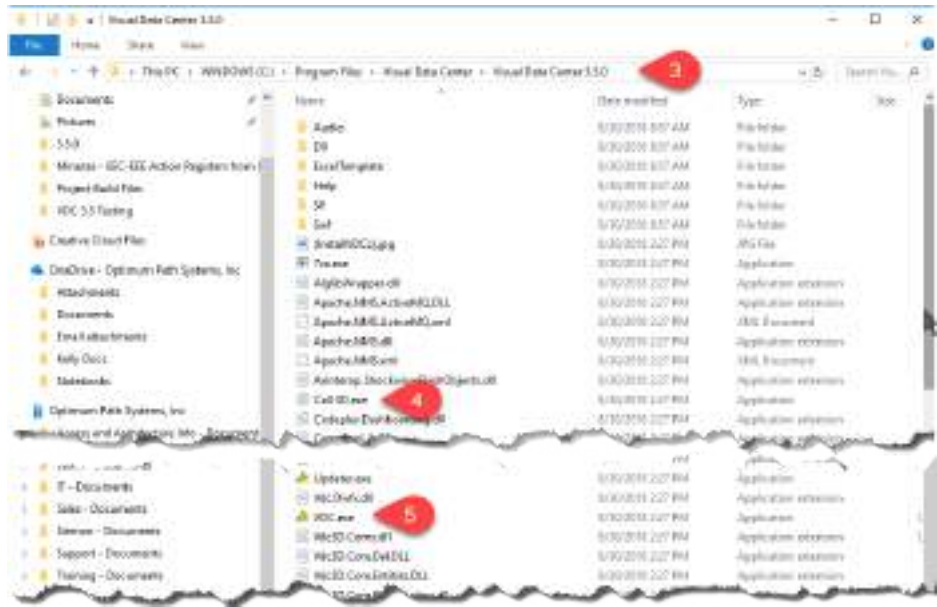
In a Citrix environment the user does not have a personal folder to retain the 3D client settings. This can be resolved by adding login information to the application string in the desktop shortcut. You will need the following information:

- URL including the http:// or https://
- Your VDC username
- The encrypted password for that VDC username

The steps below will walk you through getting the necessary information and imbedding it in a 3D client shortcut for future use.

1. Open a notepad document so you can paste the information strings for use in the final step.
2. Add your URL to the notepad document including the http:// or https:// with final slash and your username
**http://vdc55-2543.company/
username**

3. In a Windows Explorer window, navigate to the Visual Data Center 5.x folder

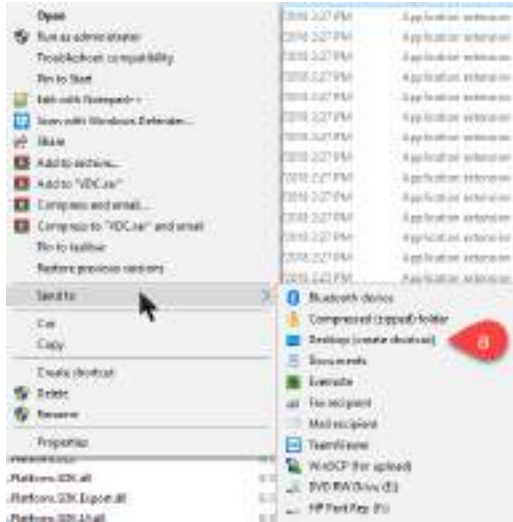


4. Locate the Call 3D.exe tool and double click to run



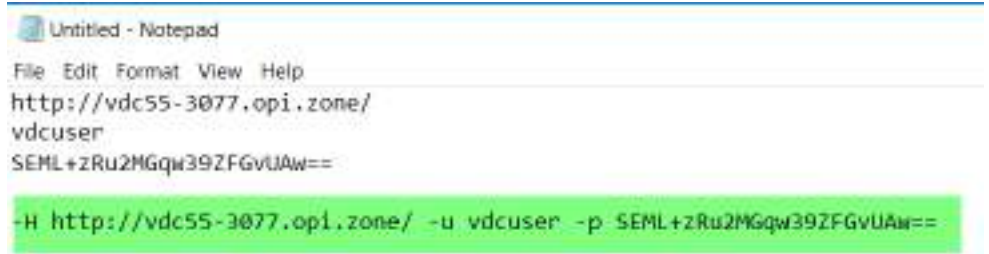
- a. Input your password
 - b. Click the Encrypt button
 - c. Click Copy button to copy the Encrypted text to the clipboard
 - d. Paste the Encrypted password text to the notepad file
5. Create a desktop shortcut for the VDC.exe file.

- a. Right click on VDC.exe and select Send to Desktop (create shortcut). This creates a shortcut on the desktop named VDC.exe.

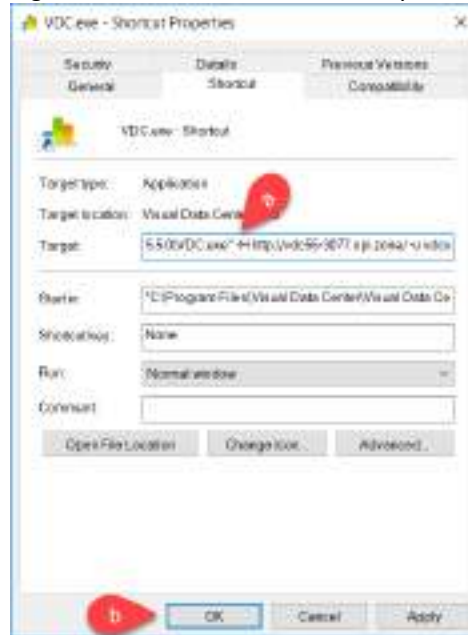


- 6. In the notepad file construct the information string that will be pasted into the shortcut and Copy.

The syntax is: **-H URL -u USERNAME -p ENCRYPTEDPASSWORD**



7. Right Click the VDC.exe shortcut on your desktop.



- a. In the Target field, after the quote at the end of the path add a space and paste the information string from your notepad file.
 - b. Click OK to save the change.
8. Double Click the desktop shortcut and the 3D Client should launch and automatically connect to the URL and login.

Manage Proxy Settings

The application has a built-in SSH Proxy component that lets you connect to the instance from a remote location (only if connection to the server through SSH is granted). This setup is configured through the Settings page. The port tunneling service performed through the 3D application remains connected during the duration of your session.

Note: You can access the 2D session of a server connected through SSH only if the 3D application is running and a connection is established.

Follow these steps:

1. Add the following line to your C:\Windows\System32\drivers\etc\hosts file:
127.0.0.1 SERVER_URL
Save and Close the hosts file after this edit has been made.
2. Open the Settings application.

For new installations, the settings window is automatically opened by the application when the installation of the server is completed.

To add a profile or modify an existing profile after the initial installation of the application, follow these steps:
 - a. Locate the application folder in the Start menu.
 - b. Select the Settings application within the directory.
 - c. Click New to create a new profile or double click an existing profile to edit its properties.
3. Select the SSH Proxy check box.
4. Specify values in the SSH Proxy input fields.

Server IP

Specifies the IP address of the server that you are trying to SSH into.

Port

Indicates port 22 unless you specify a different value.

Username

The username should be a user with access to the server such as root.

Password

Enter the root password.

Note: When the configuration is confirmed and the user runs the 3D Client and connects to the application server they will use their regular username and password. Their access to data on the application server will be controlled by the user access rights configured by the administrator of the application server.

Description

Entering a description is optional.

5. Click Submit.
The server tests the proxy settings.
6. Do one of the following:
 - If the connection is accepted, close the settings window.
 - If connection is refused, verify that settings are correct and resubmit the proxy settings.
 - Note, the session attempt will timeout if an incorrect user and password combination is supplied for the connection.

Login to a Profile

After creating an SSH Proxy connection in Settings, you can log in to that profile through the Profile window.

Follow these steps:

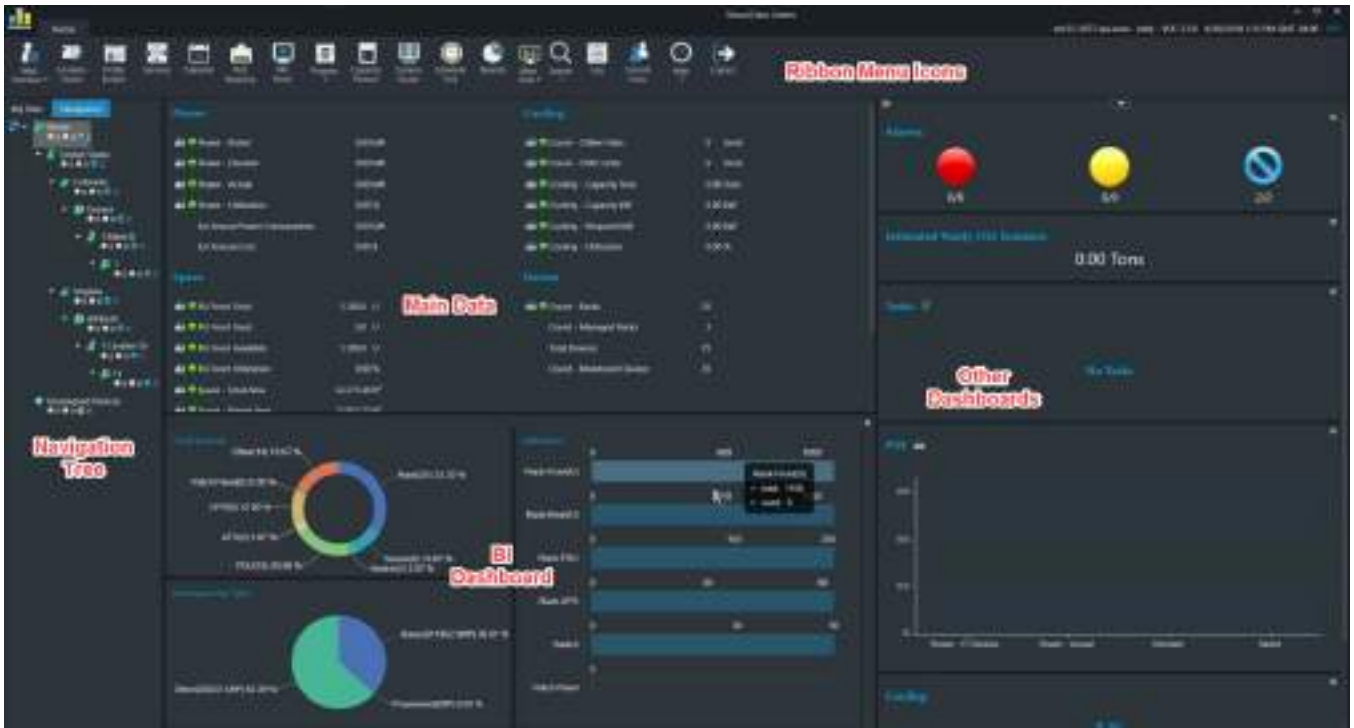
7. Open the application.
8. Select the Server Host profile.
9. Click Verify.
 - If all five ports pass, continue to the next step.
 - If one of the five ports fail, go to the Settings window and verify SSH Proxy settings for the problematic Server Host profile.
10. Click OK to close the verification window.
11. Click OK to activate the selected Server Host profile.

License Quota Control

When logging into the 3D client the application will check the system usage versus the license quotas purchased by the customer. If there is an excessive number of licenses used then the access to the 3D client will be blocked. Users will need to access the application in the web interface using an administrator account to purge excessive quota items or purchase additional licenses to apply to the server. Once the quota check is in compliance, then standard login functionality is restored.

Chapter 3: Home Page

The client interface is designed to open separate Windows for each function performed. This feature lets you take advantage of multiple monitors or easily lay out the various functions on a large network operations center screen. Each separate window function is defined further in this document, but this section describes the Home Page layout and key functions.



Navigation Tree – Lists all locations to which the user has View access rights. There are two tabs Navigation and My Sites.

- Navigation Tab - displays the full navigation tree
 - You can click the nodes of the tree to view summary data for each part of the location tree. You can also double-click floor or area names to open the floor view of the location.
 - The numbers under the node name represent the number of devices in that node and all child nodes that match the three alarm conditions. Yellow indicates Warning alarms, Red indicates Critical alarms, and Blue indicates Unreachable alarms. Monitored devices that have not been assigned a floor location are counted in the Unassigned Devices node (the last node in the tree).

- My Sites Tab - displays the list of pinned floor plans

Data Charts and Dashboards – shows dynamic system information and includes the main data area and several dashboards. The user's options for the home page layout are remembered for the next login.

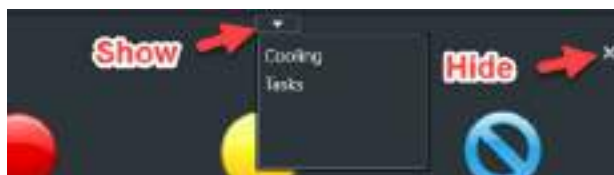
- Main Data - is the large area in the center of the screen and the display is controlled by the Main Data icon in the Ribbon Menu. The options include Site Data, Alarms, Dashboards, Trend Charts, Abstract Model and Detailed Model. Details for each option are listed below.
- BI Dashboard - is located under the main data area and displays utilization information. It can be hidden by clicking the X in the upper right corner of the area. To show simply click on the BI Dashboard button that appears when it is hidden.

BI Dashboard

- Other Dashboards - The dashboards located on the right side of the screen include Alarms, Estimated Yearly CO2 Emission, PUE, Cooling and Tasks (current project assignments).
 - These dashboards can be re-ordered by dragging and dropping where a green line appears.



- These dashboards can be hidden by clicking on the X in the upper right corner of the dashboard. To show a hidden dashboard select it from the pull-down list at the top of the column.



Ribbon Menu Icons – From left to right, these icons provide quick access to common functions from this main screen.

- Web Interface – There are two options to access a web browser session. Select Administration to go to the Admin Tab or Navigation to go to the Web Interface Home Page with Navigation Tree.
- Location Studio – Provides all functions related to managing and building out the locations present in the navigation tree.
- Profile Builder – Lets you create custom device templates.
- Services – Lets you define service events, warranty dates, and other advanced asset management items for devices in the system.
- Calendar – Lets you view and filter user and device activities within the system in either a list or calendar view.
- Port Mapping – Lets you define network and power mapping of specific device ports.
- VM Panel - Displays the hosts and the guests on the highlighted Host name.
- Projects – Lets you select Wizard or Work Order
 - Wizard to create and manage device projects and create work orders.
 - Work Order to open the work order history log, which displays past and present work orders.
- Capacity Planner – Provides building and location power consumption and power analysis functions.
- Camera Studio - Allows users to configure and view camera images for integrated IP camera devices.
- Schedule Tool – Allows users to define scheduled changes to data points for devices.
- Reports – Opens a web browser session and automatically logs the user into the report interface.
- Main Data – Lets you select the data that will be displayed in largest and Main window of the home page. The options with their descriptions are listed below. The selected option is remembered and will be displayed when the user logs in.
 - Site Data – The Site Data panel includes the Location Power, Cooling, Space information. This data here is similar to the PUE Summary.
 - Alarms – Displays the active alarms for devices in the selected node of the navigation tree. This list is updated every 30 seconds.
 - Dashboards – Displays a list of available dashboards saved to the selected node of the navigation tree.
 - Trend Charts – Displays a list of available trend charts saved to the selected node of the navigation tree.

- Abstract Model/Detailed Model – When a floor node is selected in the navigation tree these options toggle between abstract and detailed floor views.
- Search icon – Lets you search Devices, Cables and Associated Devices.
 - Devices – Lets you search for a device.
 - Cables – Allows you to find connections between devices.
 - Associated Devices – Lets you view and create device associations.
- Log – Provides access to the system log file. Note that this icon is available only for users that belong to the administrators.
- Current Users – Lets admin users view current users logged into the application and terminate sessions as needed.
- Help – Allows you get information for submitting a Model Request, accesses the User Guide and links to the Support Portal.
- Logout – Lets you log out and terminate the current session.

Search for a Device

You can search for a device within the instance's device inventory by selecting the Search icon from the home page ribbon menu and selecting Devices from the drop-down list.

Two different searches can be performed:

- Standard search - Lets you search all devices based on the specified device name.
- Advanced search - Lets you apply various filters to search criteria.

The advanced search gives you more control over the search criteria. You can view previous searches that have been completed by selecting the time clock icon in the top right corner of the Search window. You can also save searches and review them at any time.

The advanced search lets you perform multiple searches. To open a new search, you select the plus icon.

The following filters can be applied to the advanced search:

Filter	Description
Type	This value is from the Device Properties.
Manufacturer	This value is from the Device Properties.

Filter	Description
Model	This value is from the Device Properties.
Device Group	This value is from the Device Properties.
Asset Tag	This value is from the Device Attribute named Asset Tag.
Serial Number	This value is from the Device Attribute named Serial Number.
Software	This value is the Device Application from both CMDB and the custom definition.
Create Time	This value is from the Device Attribute named Create Date.
Status	This value is the Assigned/Unassigned status of the device.
Probe	This value is the Active/Inactive status of the monitoring device.
IP Address	This value is from the Monitor tab on the device if the device is set to monitor. If the device is set to static, this value is populated from the IP Address attribute for the device.
VM Host Name	This value is populated from the device attribute named. VM Host Name

To perform a standard search, follow these steps:

1. Type the device name in the Device text box.
To apply a wildcard filter use the '%' symbol before the letters.
2. Click the Search icon to apply the filter.

To perform an advanced search, follow these steps:

1. Type the device name in the Device text box.
To apply more filter options to the search select the funnel icon in the top right corner of the Search window.
2. Click Search to apply the filter.
3. Click Save.
The search is saved.

A Search is performed, and qualified devices are listed in a table. The columns, starting from the left side of the table, are defined as follows:

- Device Status – Status of the device (Available, Operational, Planned, Reserved, Decommissioned)
- Device Central – Device's Device Central
- Select the icon to open that device's Device Central
- Device Information – Device attributes
- Select the icon to open the device information and modify its attributes.
- Name – Device Name
- Type – Device Type

- Model – Device Model

You can export the search results to an Excel file by selecting the Export button located on the bottom of the Search window.

Search for a Cable

You can search for a Cable within the instance by selecting the Search icon from the home page ribbon menu and selecting Cable from the drop-down list .

You can filter a cable search by Type, Location, Device, and Name.

Follow these steps:

1. Type the cable name or device name in the Name text box.

To apply a wildcard filter use the '%' symbol before the letters.

2. Click Search to apply the filter.

You can also filter by type, cable serial number, location, and/or devices.

The Following information is provided when you search for a cable:

Name

This value is from the Port Mapping Tool.

Type

This value is from the Port Mapping Tool. It defines the type of cable that is connecting the provider and consumer together.

Provider

This value is from the Port Mapping Tool. The number after the colon signifies the port it's connected to. The provider device is where the network or power path starts between the two connected devices. For example, the provider could be the rack mount PDU and the consumer is a server that has its power provided by the rack mount PDU. The Provider device MAC Address is also included.

Consumer

This value is from the Port Mapping Tool. The number after the colon signifies the port it's connected to. The consumer device is the device that receives the network or power out between the two connected devices. For example, the consumer could be a server and the provider is a rack mount PDU with the server consuming power from the rack mount PDU. The Consumer device MAC Address is also included.

Serial Number

This value is from the port mapping feature and represents the Serial Number of the cable.

Cable Tier ID

Indicates the tier of cable tray to use if multiple tiers of cable trays are installed to the floor.

Length & Description

These values are from the Port Mapping Tool.

Chapter 4: Location Studio

The first step to configure the portal interface is to define the sites and floor plans that will be used in the application. All sites defined in this step are shown in the Navigation tree in the main window of the client interface. You access the Location Studio by selecting the icon from the home page ribbon menu .

Prerequisites

To successfully define the sites in the system, administrators must include the following information for each site:

- Address information for the building
- Floor plan images

These files should be in a standard Windows image format such as jpg, bmp, png, or dwfx AutoCAD drawing format.

- Dimension information for the location

The length of one wall is required to set the scale of the location properly.

Note that this is not an AutoCAD like tool. Scale will be a close approximation, but not accurate. The design is meant to show a graphical representation not an exact replication.

Five levels in the navigation tree (not including the World node) need to be defined in the Location Studio: Country, State or Province, City, Building, and Floor. Administrators can create different home views of other countries as needed for international deployments.

Web and 3D Location Studio Notes

Both the web and the 3D client interfaces contain features which allow users to manage navigation tree nodes and configure floorplan details. Users may build and manage these locations and floorplans interchangeably in each interface.

Create the Home View

The Home View is your view of the world map, shown after you specify your login credentials. Having a different home view of the world map is one of many ways the application lets you create a personalized instance that caters to your instance.

Follow these steps:

1. Select the Location Studio icon from the home page ribbon menu.
2. Select the Home tab in Location Studio.
3. Select Define Home icon in the top ribbon bar.
The cursor changes into cross-hairs when you hover the mouse over the world image.
4. Do the following:
 - a. Single-click on the map to create the first anchor point and move the cursor around to create a gray box over the desired area.
This gray box outlines the new home view to be created.
 - b. Verify that the desired view has been established and single-click again to create the second and final anchor point.
 - c. Review the shaded area and do one of the following:
 - If the area created is the desired home view, select yes to the prompt.
 - If the area is not the home view, select No and reconfigure.
5. Select All Users to apply the new home view for all users, or select Personal to edit only your home view.
6. Verify the saved home view by selecting the Show Home icon in top ribbon bar of the Location Studio.

How to Create the Navigation Tree

When you first log in to the Location Studio, only the world node is shown. You can define different Countries, States/Provinces, Cities, Buildings, and Floors under this node. In the provide example, the United States is used for the country.

Create a Country

Follow these steps:

1. Select the Location Studio icon from the home page ribbon menu.
2. Select the Location tab in Location Studio.
3. Select the World node on the navigation tree.
4. Click the New icon on the Location tab and select Country from the list, or right-click the World node and select Add Country.
5. Select a country from the list, type an optional description, and click the OK button.

Note: Rights access for this location is managed in the User Group membership for the user.

Create a State or Province

Follow these steps:

1. Select the Country where the State or Province will be listed in the navigation tree on the left.
2. Do one of the following:
 - Click the New icon on the Location tab and select State/Province from the list.
 - Right-click the Country name and click the Add State/Province link.
3. Select the state or province to be created.

Note: You can select multiple states or provinces with the Shift or Ctrl keys while you click with the left mouse button.

4. Click OK.

Create a City

Follow these steps:

1. Select the State or Province where the City will be listed in the navigation tree on the left.
2. Do one of the following:
 - Click the exact location of the city on the state map in the right side of the screen.
 - Select a city that has been previously added by right-clicking the State or Province in the navigation tree and click Add City from the drop-down.
3. Specify the name and description of the new City.

Create a Building

Follow these steps:

1. Select the City where the Building will be listed in the navigation tree on the left.
2. Click the New icon and select Building from the list, or right-click the city name and select the Add Building link.
3. Enter the Name or Address of the building, provide the price for power at this building, and enter the number of floors. Note, you may choose to define the value for 1 Phase and 3 Phase Voltage at the building level. Devices placed in the building will inherit this value if defined with the building node of the navigation tree. The Number of Phases attribute must be defined for the device in order for this setting to be inherited properly.
4. Click Preview to see a model view of the new building.
5. Click OK.

Note: The price for power is used in the generation of costs associated with power devices in this location. All buildings have the same building image and cannot be customized.

Create Floors

Follow these steps:

1. Select the Building where the Floor will be listed in the navigation tree on the left.
2. Click the floor on the building graphic to define the name for that floor.
3. Enter the Name and Description for this floor. You can leave the Automatic radio button selected as it will calculate the square footage based on how you construct the floor plan.
4. Define the default Voltage to use for devices placed on this floor for 1 Phase and 3 Phase devices. Note, the Number of Phases attribute must be defined for the device to inherit this value. If this value is not defined at the Floor node then devices will inherit the value defined for the building node. If Building and Floor do not define 1 Phase and 3 Phase Voltage settings then the attribute values for devices will be used for reporting purposes.

How to Define Floor Plans

After the nodes of the navigation tree have been defined, you can create the floor plan to be used in the client interface. To complete this task, you must have an image of the floor plan to upload into the application. To begin the process, you select the floor name in the navigation tree on the left and then select the Floor tab from the top of the screen. The floor configuration screen and the functions needed to create the floor plan for the system are displayed.

Upload Floor Plan Images

To upload a floor plan image, follow these steps:

1. Select the Upload Image button from the menu.
2. Browse to the file to be used as the floor plan template.
This file must be in the jpg, bmp, png, or dwfx file format.
3. Select the image file.

You can use the following standard navigation shortcut keys, which are active when you work with floor plans in the Location Studio:

- Left – Left arrow key or A
- Right – Right arrow key or D
- Up – Up arrow key or W
- Down – Down arrow key or S

You can zoom in and out by using the mouse scroll wheel. You can also click and drag the image by using the mouse button.

Upload AutoCAD Floor Plan Images

To upload a dwfx floor plan image, follow these steps:

1. Click the Upload Image button from the menu.
2. Browse to the file to be used as the floor plan template.
3. Select the image file.

You can use the following standard navigation shortcut keys, which are active when you work with floor plans in the Location Studio:

- Left – Left arrow key or A
- Right – Right arrow key or D
- Up – Up arrow key or W
- Down – Down arrow key or S

You can zoom in and out by using the mouse scroll wheel. You can also click and drag the image by using the mouse button.

Default Floor Option

The Default Floor option under the Define Floor ribbon icon on the Floor tab does the following:

- Draws walls around the outermost edge of the uploaded image
- Labels the area by using the floor name

To create a custom floor, you must define anchor points and walls individually.

Define Walls

To define walls after uploading the image, follow these steps:

1. Define the anchors or corners of each wall by selecting the Anchor Point icon.

The cursor changes to indicate that the system is in edit mode.

Left-clicking each corner of a wall in the image place a light blue anchor at each corner of a wall. To exit the Anchor Point mode, click the Esc key.

2. Select the Wall Segment icon to draw the walls of the floor. A drop down will appear prompting the user to define the type of wall that will be created: solid or cage. While defining the walls you can reselect the drop down option to change the default type. By reselecting the type of wall, its only changing walls that are created from that point on.

The cursor changes to indicate that the system is in Edit mode.

Clicking the start and end corners for the wall lets you define a wall between those anchor points. Continue defining walls from corner to corner until all walls have been added.

3. Change the attributes of the wall and make the wall a cage wall or glass wall. Newly created walls are Solid by default.
 - d. Right-click the wall.
 - e. Select Set Wall Type and select Cage or Glass as the type.

Note: In some cases, you will not be able to define all walls without moving to a new corner to start the process again. Pressing the SPACE bar or Esc key lets you exit Edit mode and start adding walls to a new part of the image. If you exit the wall draw function and want to add more walls, select the Wall Segment icon again. A dark gray line is added to the image to indicate that a wall has been added.

Set the Scale of the Image

To define the scale of the image after adding walls, follow these steps:

1. Right-click one of the walls and select the Set Scale menu item.
2. Specify the length of the selected wall, which sets the scale for the entire drawing.

Note: The unit of this option is set to feet or meters, based on the user's personal settings.

Define Floors and Areas

To define the entire area of the floor where devices can be placed, follow these steps:

1. Select the Define Floor icon from the ribbon menu on the top of the Location Studio and select Draw Floor from the drop-down list.

The cursor changes to indicate that the session is in the Edit mode.

2. Define the entire floor area as follows:
 - a. Click on the first wall anchor to select the region to be defined.
 - b. Click on the other corners of the floor in order around the perimeter of the floor.
3. Close the floor area definition by clicking on the first anchor selected.

This action displays an information box in which the floor name is already defined for this node of the floor plan.

To define individual Areas of the floor, follow these instructions. For example, offices, hallways, data centers, MDF, NOC, and so on can be defined as separate areas of a large floor view.

1. Select the Define Area icon in the ribbon bar.
2. Define the area as follows:
 - a. Click on the first wall anchor to select the region to be defined.
 - b. Click on the other corners of the area in order around the perimeter of the area.
3. Close the area definition by clicking on the first anchor selected.

Note: Pressing the Esc key at any point during the process of defining the area cancels the action and returns you to the standard View mode for the floor.

4. A configuration window will provide area settings to be defined.
 - a. Select the desired color for the area. The color selected is shown on the 3D and web floorplan to differentiate the areas within a floor view.
 - b. Area Mode - Automatic or Manual - This selection allows the user to define the size of the area or the application will determine the size based on the actual dimensions of the floorplans.
 - c. Provisioned – Indicates if the area is sold or occupied, space that is currently in use. This square foot number will be subtracted along with common raised floor from the total square footage of the area/floor and the result will be the sellable raised area. The Provisioned field is totaled up for all the areas and seen in the Provisioned cell on the 3D home page.
 - d. In Floor - Checking yes will add the area's square footage to the total floor square footage, selecting no will not include the area's square footage in the total floor square footage.

- e. Department – Assigns a Department to the area to help with power, energy and cost reporting. If multiple tenants or departments occupy the space then use the settings at the device level to drive department level reports.
- f. Power Rated | Derated – Data used for capacity and utilization reporting on Site Data for the Home Page metrics.
- g. Weight Capacity – Data used for capacity and utilization reporting on Site Data for the Home Page metrics.

Apply Grid Coordinates

Users can define a grid coordinate naming convention for rows and columns in the areas.

Follow these steps:

1. Select an area of the floor plan by clicking on the area in the graphic.
The selected area turns the original floor color a darker shade.
2. Choose the Apply Grid icon from the ribbon menu and choose either the Entire Floor or Selected Areas.

These options let you apply a grid naming system to the entire floor or selected areas. The Grid Width|Height can be defined for each “block” of the naming scheme. Start Point by default is set to the top, left part of the area, but users choose any of the four corners to start the numbering scheme. The Grid size of the first “block” can be changes to match the actual size of the grid in the area.

- Note, the grid naming scheme for letters and numbers can be edited in the web interface using the Floor functions.

Apply a Raised Floor and Perforated Tiles

You can overlay a set of raised floor tiles on the floor plan. The application uses standard two-foot by two-foot tiles for the raised floor overlay.

Follow these steps:

1. Select an area of the floor plan by clicking on the area in the graphic.
The selected area turns the original floor color a darker shade.
2. Choose the Raised Floor icon from the ribbon menu and choose either the Entire Area or Custom Area.

These options let you apply a raised floor to the entire selected region or select a specific portion of the area for a raised floor. If you select the Custom Area, highlight the area to be covered with the raised floor and provide the information required in the pop-up dialog.

3. Right click on a floor tile to indicate if the floor tile is a Common area on the raised floor. This feature allows you to track total raised floor vs common area which is not eligible for device placement. Floor tiles marked as Common will show a blue outline in the Location Studio.

Apply Common Floor Tiles

Common floor tiles is another attribute that the individual tiles can be given. By assigning a tile a “Common” attribute, you are stating that floor tile cannot be occupied. Examples of this would be walkways, door clearances, etc. The Sellable Raised Area cell on the 3D home page is a collection of the Common Raised tiles and Provisioned areas subtracted from the Total floor square footage.

Follow these steps:

1. Select a single tile or multiple tiles.
2. Right click and select Turn On Common. This will outline the tile in a blue box signaling it is common. To turn off the common attribute for a tile, select the Turn Off Common option.

Publish Devices

The Publishing Devices icon in the ribbon bar under the Floor tab only applies to dwfx uploaded image formats. When you upload a dwfx file into Location Studio, the application analyzes the image and extracts any device information that the image has embedded.

You can view the objects recognized by Location Studio (the objects created when you click the Publish Devices icon). To view these objects, select the Objects tab on the right side of the Location Studio image canvas.

Save and Activate Floor Plans

To save a floor plan, select the Save icon at the top of the screen. The changes to the floor are saved to the Location Studio only and not made public for users to add devices.

To activate a floor plan, click the Publish icon. The floor is saved and then activated to the main navigation page.

Create a Floor by Uploading an AutoCAD File

Location Studio lets you import AutoCAD floor plan images in the dwfx file format. During the image import process, the image is dissected and the blocks are analyzed for attribute matches. If the blocks have attributes defined as DEVNAME, DEVMODEL, DEVMANUFACTURE, and DEVTYPE, Location Studio automatically creates the devices and adds them to the device library database.

To upload an AutoCAD file, follow these steps:

1. Select the Upload Image icon on the Floor tab.
2. Locate the dwfx file and open the image.
3. Define the anchor points, walls, and areas for the location.
4. Apply any and all floor characteristics.
5. Verify that the floor plan is ready to be published to the floor and select Publish Floor Plan.

Note: You cannot publish devices if the floor plan is not published.

6. Select Publish Devices to create recognized devices.

Edit a Location

Any of the existing navigation tree nodes can be edited as follows:

1. Select the node in the tree and do one of the following:
 - a. Click the Modify icon at the top of the Location Studio.
 - b. Right-click and select Edit from the shortcut menu.

A dialog box with that node's specific settings is displayed. If an area/floor is removed all devices will be removed from the area.

2. Modify settings and click the OK button.

Delete Locations

Location nodes in the navigation tree can be deleted at any time as follows:

1. Right-click a node name in the navigation tree.
2. Select the Remove link from the shortcut menu.

Note: You cannot remove a node from the tree if subordinate nodes are present. For example, you cannot remove a state node if cities are still defined under that state. If you remove a floor that has operational devices located on that floor, the devices are not deleted. The devices are returned to the inventory list with an updated status of Available.

Chapter 5: Floor Plans

The floor plan view in the client application is where you can access and view the majority of the device and site data. This section covers all the functions and features related to the floor plan view in the client application.

Access Floor Plans

To open a floor plan view in the client, go to the navigation tree on the main page of the client application.

- Double-click the floor name in the navigation tree to open the floor view in a new window
- If Main Data is set to Abstract Model and you see the building displayed, you can Double-click the floor on the building to open the floor view in a new window
- If you double click an area on the navigation tree, just that area and its devices will be visible in a new window. From there you can use the Up One Level button to view the whole floor.

Floor Plan Basics

The floor plan window provides many features. They are arranged for easy access to a variety of data points from this single screen.

Mode Menu

Select by clicking on the drop-down Mode Menu next to the application logo on the upper left. The menu displays the current mode.

Provides these options:

- View Only Mode – Provides a read-only view option of the current floor plan. By default, any time a floor is opened, it is in View Only Mode.
- Edit Mode – Lets you assign, move and delete devices on the floor plan. Only users with rights to Edit Mode can access this menu item and make changes to the location. This right is controlled at the User Group privilege level.
- Close – Closes the floor plan window.

Save and Pin Icons

- The save icon, saves changes to the floor plan.
- The pin icon saves the current floor plan to My Sites tab in the navigation tree.

Ribbon Menu and Ribbon Bar

Quickly access information related to the view and perform functions on devices. Each menu option is defined further in this section.

Left Side Device Tabs in Edit Mode

View devices in the application.

- Devices – By default lists all devices in the Current Location. Using radio buttons, you can switch to All and Available devices when in Edit Mode.
 - Search – Search for device name, asset tag, serial number and IP address from devices in the Current Location by default. When in Edit Mode it will search All or Available devices based on radio button selected.
 - Add Criteria – Adds search fields for Type, Manufacturer, Product Line, Model, IP Address, Asset Tag, Serial Number and Life Cycle attributes. The system will find the device where the attribute contains the text entered in the box.
- Model – Select Model radio button to show list of models. Select Model Profile radio button to show list of defined Model Profiles which have been created using the Model Profile tool. (Not available in View Only Mode)
 - Search and Add Criteria behave as noted above against the list of models in the system.

Note, users can drag and drop available devices, models and model profiles to the floor. When you drag a model or model profile the system will prompt you to name the newly created device, select Group, Life Cycle and quantity.

- Cables – List the cables for the current location and allows the list to be exported with the Export button. To view selected Cables go to the Cables Show/Hide icon and toggle on Cables.

Right Side Device Data Tabs

Quickly access information related to the current view.

- Layer – Displays the layer window so that you can open a layer view. Only visible when viewing the floor level. Works with Add Layer Map from the Layer tools in the ribbon bar.
- Dashboards – Displays list of dashboards available for the current view.
 - A Data Points dashboard will be available showing a list of any data points that have been monitored for the selected device.
- Trend Charts – Displays list of trend charts available for the current view.
- Alarms – Displays the alarm panel, which shows the active set of alarms for the current view.
- File Depot/VM – If no device is select on the floor plan the tab shows File Depot which displays a list of files that you can open, based on the currently selected view. If a device is selected (device highlighted orange on the floor plan) then the tab shows VM which displays a list of VMs that are under that device.

Main Window

Displays all devices currently assigned to the floor plan. Alarm indicators show the alarm state of each device.

Right-Click Device Option

Right-clicking a device to presents device-specific options. Different options are made available depending on which device type is selected.

Application Tabs and Ribbon Bar

The tabs along the top provide maximum functionality on the floor plan page while keeping the key features organized for ease of use. The following sections cover each of the tabs and their features in the ribbon bar.

Explore Tab

The Explore tab lets you move around the screen, navigate location levels, and show or hide information on the screen.

- Refresh – Updates the 3D application with the current instance. Refresh is only available when in View Only mode. To refresh the screen when in Edit mode, select View Only mode.
- Reset – Resets the view of the current floor plan to the default when the view is originally opened.
- Zoom In/Out – Zooms in and out on the current floor plan.
- Other Camera Control Buttons (arrows) – Let you move, pan, rotate, and tilt the floor plan for better viewing.
- Go Back/Go Forward – Return to the previous view. For example, if you go from floor plan to a rack view, the Go Back button returns you to the floor plan view.
- Up One Level – Moves up the navigation tree one level from the current view. The levels are Device, Rack, Floor, and Building.
- Generate Humidity/Temperature – Displays the thermographic images for associated humidity and temperature points in the current floor plan view and toggles the display.
- Show/Hide Functions – check boxes to toggle viewing of various elements on the floor are now grouped under five icons: General, Device Status, Racks, Devices and Cables
 - General – Toggles the display of the Floor, Room Name and Walls.
 - Device Status – Toggles the display of:
 - Life Cycle - Displays the lifecycle of devices in the floorplan view. A legend is displayed which defines the colors of the devices.
 - Showing LEDs for Critical, Warning, Unreachable and Normal Alarms. This control is helpful when you would prefer to see only Warning, Critical, and Unreachable LEDs on the floor plan.
 - Racks – Toggles the display of:
 - Rack Capacity - Displays LEDs based on rack capacity components: weight, amps, kW, U space.

- Rack Category – Displays the colors assigned to the racks based on the Rack Category attribute of the rack. Note, the options for Rack Category can be managed using the Attributes Manager tool in the web interface.
- VM Flag – Provides an indicator on top of racks showing the number of VM server hosts located in each rack device.
- Devices – Toggles the display of the following device types: Chiller, Fire Suppression, Power Bus, Furniture and Sensor Flag.
 - Power Bus - Displays the power bus bar and associated tap boxes if checked.
 - Sensor Flag - Displays an icon where sensors are placed so users can more easily see sensor placement on large floorplans.
- Cables – Toggles the display of:
 - Cables – Displays cables selected in the right side Cables tab.
 - Cable Trays – Displays the cable tray that is above or below the racks. If cables are being displayed, clearing the cable trays check box hides the cables.
 - Fiber Channel - Displays the fiber channel components.
- Layer Functions
 - Add Layer Map – Displays an additional layer map window in the top right corner of the screen. Multiple layer maps can be opened simultaneously to view different data points in multiple windows.
 - Not Filtered/Filtered – Icon changes indicating if there is a filter applied or not. Tool allows you filter devices on the floor based on listed filter criteria.

Edit Tab

The Edit tab provides functions for organizing devices on the floor. Most of these functions are available only when you are in Edit Mode. You must have rights assigned to your User Group to be able to enter Edit Mode.

- **Save** – Saves changes made to the floor plan. Note that changes to device locations, and so on are not committed to the floor plan until the Save button is clicked.
- **Remove** – Removes the selected device from the floor plan. This action removes the device from the floor plan. It does not delete the device from the database.
- **Undo/Redo** – Erases previous action items or regenerates the action items that you created.
- **Hot/Cold Containment** – Lets you create a see-through container room that can be placed over racks. Click the icon and then drag the cursor on the floorplan to create the containment device. Once you have established the container, a pop up lets you define the name and the dimensions of the container. Once created you will see the container in the device list and you can move it around. Note, you may right click and select Modify to update the properties of the container device. If changes are made to the dimensions then you will need to close and reopen the floorplan to view the updated device dimensions.
- **Align functions** – Lets you align multiple devices with each other. Select the devices by pressing the Ctrl key and clicking several devices. This action aligns the chosen side of the devices. The reference for the alignment is the chosen side of the first device selected. So the movement of the devices is based on the first device selected.
- **Join functions** – Lets you join multiple devices side by side. This feature is very helpful for placing multiple racks in a row on the floor plan. The first device selected in the series of devices is the reference for joining devices. All devices move and attach to the first device. The second device selected attaches directly to the first device, the third device attaches to the second device, and so on. All devices automatically rotate in the join function so that all devices face the same direction.

When the Join function is selected, you can add space between the devices by entering the distance of space required.

- **Rotate functions** – Lets you rotate the device based on the option selected. CW refers to clockwise, and CCW refers to counter-clockwise.
- **Move Device functions** – Lets you move the device in the direction selected. The device moves relative to the direction it is facing.

Data Tab

The Data tab provides easy access to the variety of data available in the application.

- General Functions
 - Summary – Provides key information related to the currently selected floor plan.
 - Properties – Displays the device attributes of the currently selected device.
 - Links – Displays the list of links configured for the currently selected device. These links can be URLs or documents.
 - Device Central – Displays everything that is pertinent—name plate data, port mapping, trend charts, alarms—to a selected device.
- Alarm Panel – Displays the Alarm Panel at the chosen level of navigation. You can view the alarms for the current device, floor, or building based on their selection.
- Dashboards - Displays the Dashboards available at the chosen level of navigation. You can view the dashboards for the current building, floor, or device based on their selection.
- File Depot – Lets you see a list of files posted to the selected building or floor.
- Ports – Opens the port mapping module, which lets you map network and power relationships between devices. You must select a device to open the port mapping module.

Rack Tab

The rack tab is enabled only when you view a rack on the screen. The menu provides key functions that let you build racks easily. It is available only when you select Edit Mode.

- Shelf – Lets you easily add a shelf to the rack. Clicking a spot in the rack highlights that location in green. Clicking the shelf button inserts a shelf into the rack at the chosen location.
- Blanking Panel - Lets you easily add a blanking panel to the rack. Clicking a spot in the rack highlights that location in green. Clicking the blanking panel button selects the size of the panel. A blanking panel is inserted into the rack at the chosen location.
- Reserve Space - Lets you reserve a space of the rack for future use. Clicking a spot in the rack highlights that location in green. Clicking the blanking panel button selects the size of the panel. An orange reserve space panel is inserted into the rack at the chosen location.
- Patch Panel - Lets you easily add a generic patch panel to the rack. Clicking a spot in the rack highlights that location in green. Clicking the patch panel button selects the size of the patch panel. A generic patch panel is inserted into the rack at the chosen location.

- **Cable Manager** - Lets you easily add a cable manager to the rack. Clicking a spot in the rack highlights that location in green. Clicking the cable manager button selects the size of the cable manager. A generic cable manager is inserted into the rack at the chosen location.
- **Move Up/Down** – Lets you easily move a selected device in the rack up or down 1 or .1 U positions. Each U position is divided into three, which corresponds to most rack manufacturer screw hole locations.
- **Move to New Rack** – Lets you easily move a device from the current rack to a different rack location.
- **Cut/Paste Device** – Lets you cut the device from the current rack location and paste it into a different rack location.
- **Remove Device** – Removes the selected device from the current rack. Note this action does not delete the device from the database.
- **Rotate Left/Right** – Lets you rotate a device left or right to display correctly in the rack. This option is available only for devices that do not have a U size attribute defined. A good example of using this option is for a desktop computer sitting on the shelf in a rack.
- **Print** – Lets you print a PDF of the front and rear image of a selected rack. A list of the devices within the rack are listed below the images. Multiple racks may be selected using the Ctrl key and mouse clicks. If Print is selected with multiple racks selected then all racks and devices will be printed to the PDF document.
- **Hide/Show Enclosure** – Lets you toggle the view of the rack with or without the enclosure. This action is helpful for instances when a sensor or other device is mounted to the outside of the rack.

Virtual Machine (VM) Tab

The Virtual Machine (VM) tab lets you create, manage, and terminate virtual machines, including the host machine and the guest machine.

- **Backup** – Lets you backup virtual machine information.
- **Move** – Lets you move the location of the virtual machine.
- **Clone** – Lets you make a copy of a virtual machine.
- **VM Panel** – Opens up the VM Panel window, which provides access to VM host and guest performance information.

Services Tab

The Services tab lets you track advanced asset management features for the devices. This tracking includes service event, product maintenance, warranty tracking, and more. Specific details for the Services module are covered later in this document. These icons let you view data configured in the main Services module.

- Asset Info – Lets you track costs, purchase and service dates, and invoice or PO documents with other advanced asset information.
- Warranty – Lets you view warranty information along with access to the Warranty document.
- Services Calendar – Lets you view a calendar of scheduled events for the selected device.
- Location History – Lets you view a history of locations for the device.
- Work History – Lets you view the work log for the selected device.

Help Tab

The Help tab provides easy access to key support topics and tools.

- Keyboard Shortcuts – Displays a list of keyboard shortcuts that can be used to navigate within the application.
- Support Portal – Opens a browser window and displays the login to the CA Support portal.
- User Guide – Opens a PDF version of the user guide.

Left Side Tabs

The left side tabs let you view existing devices and cables and create devices to place on the floor plan.

Devices Tab

Allows you to search for existing devices.

- All – Searches through all devices.
- Available – Searches only the available devices.
- Current Location – Searches only the devices in the currently selected location.
- Search – The search will check if the text entered in the search field is contained in device name, asset tag, serial number and IP address.
- Add Criteria – Adds search fields for Type, Manufacturer, Product Line, Model, IP Address, Asset Tag, Serial Number and Life Cycle attributes. The system will find the device where the attribute contains the text entered in the box.

Note, search fields are cumulative, a device must match all of the conditions specified to appear on the list.

- You can drag and drop the devices from the list directly onto the floor plan or rack to assign devices to the floor plan.

Model Tab

The Model tab is available only in Edit Mode for the floor plan.

- Model – Searches all the models in the master model database.
- Model Profile – Searches the list of Model Profiles which have been created using the Model Profile tool.
- Search – The search will check if the text entered in the search field is contained in the model name.
- Add Criteria – Adds search fields for Type, Manufacturer, Product Line and Model. The system will find the model where the attribute contains the text entered in the box.

Note, search fields are cumulative, a model must match all of the conditions specified to appear on the list.

- You can drag and drop the devices from the list directly onto the floor plan or rack to create devices and assign them to the floor plan.

Cables Tab

The Cable tab is available in both View Only Mode and Edit Mode for the floor plan. It lists the cables for the current location.

The Model tab is available only in Edit Mode for the floor plan.

- Show/Hide the various types of cables toggling the Power Cables, Network Cables, Fiber Cables and Storage Cables check boxes.
- Export – Click to run the Cable Report to a pdf file.
- To view selected Cables on the floor plan go to Cables Show/Hide icon and toggle on Cables.

Right Side Device Data Tabs

The right side tabs quickly access information related to the current view.

Layer Tab

Displays the layer window so that you can open a layer view. Only visible when at the floor level. Works with Add Layer Map from the Layer tools in the ribbon bar.

You can open a 2D window that is identical to the standard 3D floor plan view. You view a variety of data points and metrics overlaid on the devices in the 2D window. Selecting the Layer tab from this list displays the thumbnail view of the layer window. Choosing the Maximize icon in the thumbnail window opens the layer window to a full screen view

Dashboards Tab

Lists all available dashboards for the floor. If a device is selected, the available dashboards for that device are listed.

- A Data Points dashboard will be available showing a list of any data points that have been monitored for the selected device.

Trend Charts Tab

Displays list of all available trend charts for the floor. If a device is selected, the available trend charts for that device are listed.

Alarms Tab

Displays the alarm panel for all devices on the floor. If a specific device is selected, only alarm data for that device is displayed in the alarm list.

File Depot/VM Tab

If no device is select on the floor plan the tab shows File Depot which displays a list of files that you can open, based on the currently selected view. If a device is selected (device highlighted orange on the floor plan) then the tab shows VM which displays a list of VMs that are under that device.

Chapter 6: Floor Plan Editing Tasks

Enter Floor Plan Edit Mode

To perform floor plan editing tasks, you must enter the Floor Plan Edit mode as follows:

1. Click the application icon in the top left corner of the window.
2. Select Edit mode.

Navigation Shortcut Keys

The following navigation shortcut keys are available in Floor Plan Edit mode:

- Zoom in – mouse wheel up
- Zoom out – mouse wheel down
- Move left – A, left arrow
- Move right – D, right arrow key
- Move backward – S, down arrow key
- Move forward – W, up arrow key
- Rotate clockwise – Q
- Rotate counter clockwise – E
- Tilt front – F
- Tilt rear – R
- Go back – Esc
- Generate thermal – F2
- Add layer map – F6
- Save – Ctrl + S
- Remove device – Ctrl + D
- Rotate clockwise 5 degrees – Ctrl + Q
- Rotate counter clockwise 5 degrees – Ctrl + E
- Rotate left – Ctrl + left arrow key
- Rotate right – Ctrl + right arrow key
- Show/hide rack frame – F3
- Smart interface – F12

Place Devices on the Floor

You can place one device on the floor or multiple devices on the floor at the same time. Available devices are listed on the Search tab on the left.

To place one device on the floor, follow these steps:

1. Find the device to place on the floor.

You can search for the device by using the filter or by manually putting the name in the Device Name tag.

2. Click the device and drag it onto the floor.

When the device is on the floor, you can move it to the required location, as described in [Move Devices](#) (see page 58).

To place multiple devices on the floor at the same time, follow these steps:

Note: Multiple devices to be placed on the floor at the same time must be in sequential order in the device list.

1. Select the first device to be placed on the floor from the device search list.
2. Hold down the Shift key and select the last device to be placed on the floor.
3. Click the last device that you selected and drag it onto the floor while still holding down the Shift key.

If the device is mounted on a position which belongs to more than one area (embedded areas), the area listed for the location of the device will be the smallest of the embedded areas.

Place Cable/Fiber Trays on the Floor

You can place cable tray/fiber channel/power bus pieces on the floor. Available cable tray/fiber channel/power bus items can be located on the Cable Tray tab on the left-hand side of the 3D floor plan.

To place a tray component on the floor, follow these steps:

1. Find the tray component to place on the floor.
2. Click the device and drag it onto the floor.

If component being placed on the floor is a Straight Section, you must define the length of the straight piece.

3. Raise or lower the height of the tray above or below the floor by selecting the Set Height icon in ribbon bar in the Edit tab.

By default, the tray is placed 3.048 meters or 10 feet above the data center floor.

Tap Box Snap-To Power Bus Bar

On power bus bars, tap boxes can be placed with a snap-to feature. The tap box appears to snap into a track along the bottom of the power bus bar.

1. Place a straight section generic power bus bar on the floor.
2. Place a tap box on the floor.
3. Select the tap box (it becomes orange) and move the virtual box outline of the tap box to the power bus bar when the bar turns orange, the tap box snaps-to the track and you can slide along the bar to the final position.

Note: Multiple tap boxes can be placed at the same time when selected with the Control key.



Connect Cable Tray Components

You can connect multiple tray components to create a full cable tray system. To connect cable tray components together, follow these steps:

1. Verify that both desired components are located on the same floor plan.
2. Locate the anchor point tray first by selecting the anchor tray's connecting side gray box.

The selected box turns green to indicate that it has been selected properly.

3. Select the second component's connecting side gray box.

If the second component is selected correctly, it connects to the anchor component.

Search Filter

The search filter is a very powerful tool. In Edit Mode, the filter lets you perform many actions.



Numbers 1 and 2 in the graphic above refers to the following information:

1. Creating New Devices – Refer to [Create New Devices](#) (see page 63).
2. The application has nine device statuses:
 - Available – The asset is available and is not currently placed on a floor plan.
 - Procurement – Refers to a device which are planned to be added in the data center. This device does not currently exist yet in the list available to the user to place on the floor plan.
 - Reserved Procurement – A procured asset that has a work order created stating the device is to be placed and is awaiting work order completion. The RU that the device is to occupy has a gold blanking panel in its place signaling the reservation. All ports associated with the asset are also reserved with a gold plate covering their network port or power port.
 - Reserved Available – An asset that is currently created and in the inventory list but is being used in a work order and to be installed in a rack.
 - Reserved Move – This is a shallow copy of the device that is selected for a move through a work order. This copy will remain in the RU rack position until the work order is completed. Once completed the shallow copy will be removed and the original device will take its place.
 - Operational – The asset is currently residing on the floor plan.
 - Operational Moving – An asset that is residing in an RU that has been referred in a work order as action type Move.
 - Decommissioned – An asset that is being removed from the asset list. It differs from the state of Available because it cannot be placed back on the floor plan.
 - Plan Decommission – An Available/Operational asset that has been selected in a work order for decommission.

Move Devices

To manipulate a device's position on the floor, click and drag the device to a location. More advanced device movement controls are accessible through the Edit tab at the top of the Floor Plan Edit mode ribbon bar.

- Rotate functions – Let you rotate the selected device based on the option selected. CW refers to clockwise, and CCW refers to counter-clockwise.
- Move Device functions – Let you move the selected device in the direction selected. Note that the device moves relative to the direction in which it is facing. The solid green face on the selected device is considered the front of the device.
- Align functions – Let you align multiple devices with each other. You select multiple devices by using the Ctrl key and clicking several devices. The align functions then align the selected side of the devices. The reference for the alignment is the chosen side of the final device selected. So all devices move based on the final device selected by the user. The green highlighted face of the device is the front of the device.
- Join functions – Let you join multiple devices side by side. This function is helpful for placing multiple racks in a row on the floor plan. The final device selected in the series of devices is the reference for joining devices. All devices move and attach to the final device. The first device selected attaches directly to the final device, the second device attaches to the first device, and so on. All devices automatically rotate in the join function so that all devices face the same direction.

When the Join function is selected, you can add space between the devices by entering the distance of space required in the information prompt.

Move Multiple Devices at the Same Time

You can select multiple devices from the Search tab in Floor Plan edit mode.

Note: Devices must be in sequential order on the Search tab to be placed on the floor plan simultaneously.

To move multiple devices to the floor plan at the same time, follow these steps:

1. Select a device on the Search tab by its type name.

Selecting its name opens up its Device Central page because the name itself is a hyper link.

2. Hold down the Shift key and select the last device to be placed on the floor.

All the other devices to be placed as a group should be in between the first and last device selected.

3. Keep holding down the Shift key, select the last device you selected from the list, and drag it to the floor plan.

The last device selected and all the other devices highlighted in the list are moved onto the floor plan.

Delete and Save Devices

Save and delete icons are located within the Edit tab in the Floor Plan ribbon bar.

To save a floor plan and update the database, do one of the following:

- Click the Save button on the ribbon bar.
- Click the save icon in the top left corner.
- Press CTRL + S

To delete a device placed on the floor, select the device and click the trash can button. If you are removing a device from a rack and ports are currently connected to that device, you are informed about the connections.

Clone Devices

You can clone a device in two ways:

- In the 2D Web Administrative interface
- In 3D on the floor plan

To clone devices while on the 3D floor plan, follow these steps:

1. Hold down the Ctrl key and select the devices to be cloned.

Note: When you clone racks, devices in or on the rack are not cloned.

When selecting the last device to be cloned, click and do not release the mouse button.

2. Move the mouse to a vacant spot on the floor and release the mouse button.

All the devices that you selected are cloned and placed on the floor.

Chapter 7: Rack Builder

The application contains a sophisticated rack building interface that lets you create images of racks and rack-mounted devices in the data center. Rack Builder also provides information about capacity and actual attributes of the rack. You can access the rack view by double-clicking a rack in the floor plan view. Note that U positions are determined based on the bottom edge of the device when it is placed in the rack.

Rack Builder Components

The Rack Builder window provides information about the rack and devices within the rack. The Assigned device list at the top left of the window shows a list of devices mounted in the rack. The Search window provides a list of devices to mount onto the rack. The Rack Summary in the bottom left of the window provides a total of key values for all devices mounted into the rack.

Note that each U position consists of three sub U positions, which allow more granular mounting of devices onto the rack. Devices can be mounted to the front, back, left, and right positions.

How Devices Are Assigned to a Rack

Once the Rack Builder module has been launched, you can mount devices into the rack to create images of their actual racks in the data center and network closets. Two methods for mounting devices into the rack with this module are defined in this guide. Both methods must be performed in Edit Mode for the rack, not the View Only Mode.

Assign Devices Already Defined in Device Manager

If you have already defined a device in the Device Manager, search for the device and place it within the appropriate U space in the rack.

Follow these steps:

1. Select the Search menu from the top right of the Rack Builder window.
2. Find the device that needs to be mounted to the rack by using one of these options:
 - Type a partial device name in the progressive search box and click the Search icon to the right of the text box. A list of all devices that meet the criteria of the search is returned.
 - Use the filter icon to select the Type, Manufacturer, Product Line, or Model for a list of target devices. You can also use the filter function to filter based on whether a device has been assigned to a floor plan or is still available.
3. Select the device that needs to be assigned to the rack.
4. Drag the device name into the correct position on the rack.

An orange highlight indicates the final position for the device when the mouse button is released. The U position is shown if you pause mouse movement while the device is over a valid position on the rack.

If the device being placed has a state of Available or Procurement and the device is to be reserved in its current RU continue to step 5. If the device being placed has a state of Available or Procurement and the device is to be mounted there based on availability, continue to step 8. If the asset is to be placed in the rack with no filter options, save the floor plan and the device will have its status changed to "Operational."

5. With devices that have a state of Available or Procurement, right click on the device image within the rack and select the "Plan Installation" option to define the installation of the asset.
6. A popup window will appear displaying filter options: Power Available, Power Ports, Network Ports, Storage Ports, and the last option which is not shown but automatically applied is Rack Weight. Select the filter options that are to be applied to the installation of the asset. Select OK to apply the filter.
7. If the device meets the filter requirements the device will now change states:
 - a. "Reserved" for a device with the status of "Available" and the device will get an "R" placed on the device image front symbolically representing the reserved state.
 - b. "Reserved Procurement" for a device with a status of "Procurement" and the device will get an "RP" placed on the device image front symbolically representing the reserved procurement state.
8. With devices that have a state of Available or Procurement, right click on the device to be formally mounted in the rack and select the "Move Device" option.

9. A popup window will appear displaying filter options: Power Available, Power Ports, Network Ports, Storage Ports, and the last option which is not shown but automatically applied is Rack Weight. Select the filter options that are to be applied to the installation of the asset. Select OK to apply the filter.
10. If the device meets the filter requirements, the port connections and RU will be populated and the device state will change to “Operational.” If the device does not meet the filter requirements the device will not be mounted.

Creating New Devices

Devices can be defined within the Rack Builder module.

Follow these steps:

1. Use the filter function in the device Search window to select the model of the new device to be created.
Choose the appropriate options from the Type, Manufacturer, Product Line, and Model drop-down boxes.
2. Click the Add icon.
3. A popup window will appear asking of input on the devices attributes and Status. The two options available in the Status menu for the new device are Procurement and Available. Refer to the Device Status section for a definition of each state.
The device is added to the device list.
4. Drag the newly added device from the device list onto the rack.

Reposition/Re-State Rack Devices

All the below action are completed through the rack view on the 3D floor plan.

Reposition Rack Devices

Manual Moving

To reposition devices within the rack, click and drag a device to a new position in the Rack Builder module. The device is anchored to the nearest U position. As the device is being moved, an indicator lists the current U position of the device.

Icons on the Rack ribbon menu also let you reposition a device. Click the Move Up/Move Down icons to reposition the device by 1.0 or 0.1 U positions.

Automate Device Reserve Moving

To reserve the moving of a device from one rack to another, follow the below steps:

1. Select a device that is located in a rack RU and has a device state of "Operational" and right click to select the "Plan Move" option.
2. A popup window will appear displaying filter options: Power Available, Power Ports, Network Ports, Storage Ports, and the last option which is not shown but automatically applied is Rack Weight. Select the filter options that are to be applied to the installation of the asset. Select OK to apply the filter.
3. If the device meets the filter requirements the device's move to RU will be populated with a shadow copy of the device. This shadow copy will have a "RM" placed on the device symbolically representing the device's state of Reserved Move. The original device will remain in the original RU and will get an "OM" placed on the device image. The original device gets locked down restricting users to only editing the name and VMs.

Automate Device Moving

To move a device from one rack to another, follow the below steps:

1. Select a device that is located in a rack RU and has a device state of "Operational" and right click to select the "Move Device" option.
2. A popup window will appear displaying filter options: Power Available, Power Ports, Network Ports, Storage Ports, and the last option which is not shown but automatically applied is Rack Weight. Select the filter options that are to be applied to the installation of the asset. Select OK to apply the filter.
3. If the device meets the filter requirements, the device will be moved to the new rack RU and all new port connections will be automatically created and connected. All previous connections will be removed simultaneously. All peripherals will be disconnected as well.

Re-State Rack Devices

To change the state of “Reserved” to “Operational” of a device while in the rack view, follow the below steps:

1. Select a rack mounted device in the rack that has a device state of “Reserved Available”, “Reserved Procurement”, or “Reserved Move” and right click to select the “Set Operational Status.”

A popup window will appear prompting the user for the following:

“The device and its connections will now have a status of ‘Operational,’ do you want to continue?”

2. Select **Yes** to complete the action or select **No** to return to the rack view.

Cancel Reservation

To cancel the reservation of a device while in the rack view, follow the below steps:

1. Select a rack mounted device in the rack that has a device state of “Reserved Available”, “Reserved Procurement”, or “Reserved Move” and right click to select the “Set Operational Status.”

A popup window will appear prompting the user for the following:

“Are you sure you want to cancel the reservation?”

2. Selecting **No** will close the popup. Selecting **Yes** will remove the reservation. The below actions will also be completed based on the devices current state:

If the asset currently has a “Reserved Available” status, then the asset will be unmounted from the rack and all connections removed. The device status will be changed to “Available.”

If the asset has a “Reserved Procurement” status, then the asset will be unmounted from the rack and all connections will be removed. The device status will be changed to “Procurement.”

If the asset has a “Reserved Move” status, the shadow copy will be removed from the rack, all connections will be removed, and the device will be deleted. The parent asset will be unlocked and its status will change from “Operational Moving” to “Operational.”

Decommissioning a Device

To decommission an asset from the rack view, follow the below steps:

1. Select an operational rack mounted asset from the rack view and right click to select the “Decommission Device” option.

A popup window will appear prompted the user as follows:

“Are you sure you want to decommission the device? Yes or No?”

2. Selecting “Yes” will change the “Operational” status to “Decommission.” The device will get unmounted from the rack, all peripherals removed, all connections and all related assets will be removed.

Planning a Decommission

To plan the decommission of a rack mounted asset, follow the below steps:

1. Select an operational rack mounted asset from the rack view and right click to select the “Plan Decommission” option.
2. The device will appear shadowed out and will have a “PD” placed on the device image symbolically representing that the asset is planned for decommission.

Decommission a Planned Decommissioned Asset

To decommission a planned decommissioned asset, follow the below steps:

1. Select a device with a status of “Plan Decommissioned” in the rack and right click to select the “Decommission Device” option.

A popup window will appear prompting the user with the following:

“The device will be decommissioned, are you sure you want to continue?”

2. Selecting No will return user to rack view. Selecting Yes will change the asset’s status to “Decommissioned,” all connections will be removed, all peripherals and related assets will be removed.

Cancel a Decommissioning

To cancel the decommissioning of a “Planned Decommission” asset, follow the below steps:

1. Select a device with a status of “Plan Decommissioned” in the rack and right click to select the “Decommission Device” option.

A popup window will appear prompting the user with the following:

“Are you sure you want to cancel the decommissioning of the asset?”

2. Selecting No will return the user to the previous screen. Selecting Yes will change the device’s status from “Plan Decommission” to “Operational.”

Remove Devices from Racks

To remove devices from their rack assignment, click the device in the rack and then click the Remove icon on the Edit menu on the ribbon toolbar at the top of the window. If a device has separate components, for example such as blade chassis and blade servers, all components will be removed from the Rack if the blade chassis is removed.

Removing devices from the rack does not delete them from the database. Instead, it removes the device from the rack and floor plan view, and changes the device state to Available.

Add Non-Rackmount Devices

In some cases, you may need to add devices to the rack, but they are not able to be mounted directly to the rack frame. Examples of these scenarios are the need to add a monitor, modem, zero U power strip and other similar devices. The rack building tool lets you mount these devices directly into the front or back of the rack. You can also mount zero U power strips to the side of the rack by dragging and dropping devices from the device list directly to the side view of the rack.

View a Rack Summary

The Rack Summary display provides capacity information for the rack being viewed. When you view the rack, the summary window is displayed on the bottom left of the main window.

On the summary detail, you can see the Rack Capacity and Actual information related to a series of categories which include Weight, Watts, Amps, and BTU. In some cases, you may see a value such as "2000+?" accompanied by a Yellow LED in the LED column. The question mark indicates that the attribute is not defined for one of the devices mounted to the rack.

Placing the mouse over the LED lets you see which devices do not have that attribute defined so they can update the attributes of that device to eliminate the indicator. When the rack capacity has been exceeded by the Actual value, a Red LED appears in the LED column.

Note, if users do not have rights to the Summary feature in their User Group privileges then the Summary icons will be disabled.

Move Device Tool

The rack building tool lets you easily move a device from one rack to another. When viewing a rack, select a device in the rack and click the Move to New Rack icon from the Rack ribbon toolbar.

- Rack – Select the destination rack for the device being moved. The standard Search and Filter options are available for the list of racks. Click the destination rack in the list.
- U Position – Depending on which rack is selected from the list, define which U position will be occupied by the device in the destination rack. The size of the device is matched against the available U positions in the rack and a list of all available positions is provided in the U Position drop-down.
- Submit and Cancel – Select the Submit button to move the device or select the Cancel button to cancel the move function.

Place Components into Enclosures

The Rack Builder lets you place individual blade servers within a blade enclosure or switch cards into a switch chassis. This feature is commonly used with blade chassis and blade servers or with Cisco 6500 switches and individual switch cards.

To complete this action, follow these steps:

1. Place a Blade Enclosure or Switch Enclosure on the Rack.

Complete this step with the same device placement steps defined earlier in this section.

2. Find the component device (blade server or switch card) in the device list.
3. Drag and drop the component onto the enclosure/chassis device.

If the component is supported by the chassis, an orange highlight shows the position that can be occupied by the component device.

4. Release the mouse button.

The component is assigned to the enclosure/chassis.

Device Collision Management

The Rack Builder has built in functionality that prevents users from adding devices that will 'collide' with one another when the device is placed into the Rack.

Examples of Device Collision Management:

- Mount a device in U position 20 in the front of the rack and then mount another device in U position 20 in the back of the rack. If these two devices are too deep and 'collide' with one another, Rack Builder will prevent users from placing the second device in that U position.
- Mount a device in U position 25. Try to add another device to U position 25, Rack Builder will prevent users from completing this action.

Chapter 8: Floor Plan Layers

The Layer view lets you view a single data element on multiple devices simultaneously. This function enables you to evaluate trends in the data center. Depending on the data element being viewed, you can take appropriate action to fix issues if needed. This floor plan layer function is located on the right side of the 3D floor plan window. If the layer window is not visible, click the button on the ribbon bar to add a layer window.

Clicking the Add Layer Map button multiple times adds more than one layer window for viewing. On the layer box, click the maximize option to expand layer.

Layer Options

Selecting a layer from the floor plan layers menu on the left displays that characteristic or value of the device in the main view of the floor. Typically, a legend appears on the top right of the screen to define the color codes used for that particular view. The following is a brief description of the available layers that you can select:

UI Layers

- Alarm – This default view of the floor plan lets you see the alarm LEDs on each device if that device is in an alarm state. The LED displayed corresponds to the exact state of the device as of the most recent polling event.
- Device Names – Displays the device name. If no device is assigned, then this field is blank.
- Device Type – Displays the device type. If it is an object and not a device, the field is shaded gray and does not display any name.

Rack Layers

Each of these values are displayed only if the device is a rack. If the device is not a rack, they are shaded gray and do not display any data.

- Ports – Fiber Available – Displays the total number of unoccupied fiber ports on that rack.
- Ports - Fiber Reserved – Displays the total number of reserved fiber ports on that rack.
- Ports – Fiber Total – Displays the total number of fiber ports that are in that rack. A fiber port may be located in another rack and have its fiber ports reserved/mapped for another rack. In that instance, the ports would be visible on the reserved rack, not the rack it is placed in. Refer to Port Reservation for more information.
- Ports - Fiber Used – Displays the total number of occupied fiber ports on that rack.
- Ports – Network Available – Displays the total number of unoccupied network ports on that rack.
- Ports – Network Reserved – Displays the total number of reserved network ports on that rack.
- Ports – Network Total – Displays the total number of network ports that are in that rack. A network port may be located in another rack and have its network ports reserved/mapped for another rack. In that instance, the ports would be visible on the reserved rack, not the rack it is placed in. Refer to Port Reservation for more information.
- Ports – Network Used – Displays the total number of occupied network ports on that rack.
- Ports – Power Available – Displays the total number of unoccupied power ports on that rack.
- Ports - Power Reserved – Displays the total number of reserved power ports on that rack.
- Ports - Power Total – Displays the total number of power ports in that rack. A power port may be located in another rack and have its power ports reserved/mapped for another rack. In that instance, the ports would be visible on the reserved rack. Refer to Port Reservation for more information.
- Ports – Power Used – Displays the total number of occupied power ports on that rack.
- Rack Capacity – Displays the capacity of the rack in U.
- RU Front Max Contiguous – Displays the largest continuous amount of rack space available in the front of the rack. This value is helpful in understanding where a 10U blade chassis can be deployed.

- RU Front Reserved – Displays the amount of reserved rack space and is displayed in U. The value will have the format of Front Space Reserved/Capacity (for example, 14/42).
- RU Front Used – Raw number of U positions used in the front of the rack.
- RU Front Utilization – Displays the amount of front rack space used and is displayed in U. The value has the format of Front Space Used/Rear Capacity (for example, 14/42). Floor spaces are color-coded to show the % of rack space currently utilized. The legend defines the colors as compared to percentages.
- RU Rear Max Contiguous – Displays the largest continuous amount of rack space available in the rear of the rack. This value is helpful in understanding where a 10U blade chassis can be deployed.
- RU Rear Reserved – Displays the amount of rear rack space reserved. The value is displayed in U and has the format of Rear Reserved Space/Capacity (for example 14/42).
- RU Rear Used – Raw number of U positions used in the rear of the rack.
- RU Rear Utilization – Displays the amount of rear rack space used. The value is displayed in U and has the format of Rear Space Used/Rear Capacity (for example, 14/42). Floor spaces are color-coded to show the % of rack space currently utilized. The legend defines the colors as compared to percentages.

Environment Layers

Each of these options has color-coded results that tie back to the colors defined in the legend on the top right of the floor plan window.

- Humidity – Displays the humidity value for that device. This value maps to the monitor attribute located in 2D under the Device tab. Refer to *Web Administration User Guide* for more information.
- Temperature – Displays the temperature value for that device. This value maps to the monitor attribute located in 2D under the Device tab. Refer to *Web Administration User Guide* for more information.
- Temperature Discharge and Temperature Return – Display the values assigned to the "AC – Discharge Temp" and "AC – Return Temp" monitor attributes.
- Thermal Lower, Middle and Upper – Provide a thermal graphic on the floor plan, based on the values assigned to devices in the EnvTemp monitor attribute setting. If these monitor attributes have values mapped to them, the thermal layers display those temperatures in a thermal graphic by using the thermal algorithm in the product. When you view thermal layers, the value assigned to the Layer – Temperature monitor attribute is displayed as the value on the device.

Energy Layers

- A/B Side Current – Available for Rack devices only. This shows the Current Actual values for the racks.
- A/B Side L1 Current – Available for Rack devices only. Shows the Phase 1 Current data for the racks.
- A/B Side L2 Current – Available for Rack devices only. Shows the Phase 2 Current data for the racks.
- A/B Side L3 Current – Available for Rack devices only. Shows the Phase 3 Current data for the racks.
- Current Actual (A) –Displays the Amps collected for that device. If the device is set to monitor, this value is real time data. If it is set to Static, this value is pulled from the device attributes.
- Current Derated (A) — This value is mapped to the device attribute Current Derated.
- Current Utilization (A) — This value is math-based on the other Amps layers as follows: $\text{Current Actual} / \text{Current Derated} * 100$.
- Power Actual (kW) – Displays the Kilowatts collected for that device. If the device is set to monitor, this value is real-time data. If it is set to Static, this value is pulled from the device attributes.
- Power Derated (kW) – This value is mapped to the device attribute Power Derated and is a static data point.
- Power Utilization – This value is math-based on the other kW layers as follows: $\text{kW Actual} / \text{Rack Kilowatts Capacity} * 100$.

Layer Filters

Layer Filters let you limit the viewable devices by constraining their display with one or multiple criteria. This tool can help you understand how certain components of the data center are operating at a given time.

The Layer Filter options let you filter devices by using two different methods: By Layer or By Device. These options can work in with each other to provide maximum viewing flexibility.

Filter By Layer

Filtering by Layer lets you filter device views based on a series of data filters. The following is an example of how the Layer Filter tool lets you find racks on the floor plan that meets certain criteria:

- Rack has under 16U contiguous space available
- Power Ports remaining is greater than 80
- Rack Temperature is less than 82 degrees

Each required criterion is added to the filter list and the Filter button finds devices that match the defined criteria. Selecting a single criterion item and clicking Delete removes the filter item from the list. Clicking the Clear button clears all filter settings. You must click the Filter button after changes to the filter list to update the device view on the main page.

Add these filter criteria to the filter tool as follows:

- Select the Add button to define the first criterion for the Search.
- Select the Layer Type. If the layer is a value, select the Value option. If the value is Yes or No, select the Enumerate option.
- Select a layer to view (for example, the Temperature Layer).
- Select the operator for the value being compared.
- Enter the Value used for the comparison in the filter.
- Click the Add button. Criteria are added to the search window.
- If additional criteria need to be added, repeat these steps as required.
- Click the Filter button. Only devices that match the criteria are displayed.

When you click the Execute button, the resulting image displays only the devices that meet the filter criteria.

Filter By Device

Filtering by Device lets you view only data for certain Device Type, Manufacturer, Product Lines, Models, or Device Groups.

To use this function, select the required filter criteria from the drop-down boxes provided and click the Filter button.

Note that the By Layer and By Device filter options work in with each other. This feature provides maximum flexibility in viewing the device layers based on data or on device characteristics.

Layer History

A unique feature of the application is how you can view the history of certain layer values over a user-specified time. This feature provides a different graphical view of historical data related to environmental and power conditions in your facility.

The layer history has these components and settings available to control the playback of the historical data for the chosen layer view:

- Start Time – Lets you specify the starting date and time to begin the replay of data.
- End Time – Lets you specify the ending date and time to stop the replay of data.
- Speed – Lets you specify the number of seconds to pause on each frame of the view (1–59).
- Play, Stop, Reset – Lets you control the playback of the data.
- Timeline – Provides information on progression from start to end time and the currently viewed Date/Time.
-

Chapter 9: Dashboards & Trend Charts

Dashboards

To view dashboards, follow these steps:

1. Click the Dashboard icon on the 3D home page.

A list of all the dashboards that have been associated with that highlighted floor appears below the 3D floor model. Only the Specific Device Dashboards are visible at the floor level. For more information, refer to the Web Administration User Guide.

2. Double-click the Dashboard Name to view the desired dashboard.

A new window shows the dashboard.

View Trend Charts

Trend chart allow data to be stored over time and shown in a way that depicts the devices movement in the past.

To view a trend chart, follow these steps:

1. Click the Trend Chart icon on the top of the ribbon bar.

The trend charts that are visible on the selected floor appear in a list under the 3D floor model.

2. Select a Trend Chart Name from the list.

A new window appears and shows a trend of the monitored data.

A filter above the trend chart provides these options:

- 1 Hour – shows data plotted over a hour. You can select a certain hour by adjusting date and time from the Start and End filter.
- 1 Day – shows data plotted over a day. You can select a certain day by adjusting date and time from the Start and End filter.
- 1 Week – shows data plotted over a week. You can select a certain week by adjusting date and time from the Start and End filter.
- 1 Month – shows data plotted over a month. You can select a certain month by adjusting date and time from the Start and End filter.
- 1 Year – shows data plotted over a year. You can select a certain year by adjusting date and time from the Start and End filter.

Chapter 10: Alarm System

Alarms Overview

The alarm engine generates alarms when actual values collected in the monitoring process cross into user-defined threshold ranges. The result of this threshold-to-data relationship is that the device is tagged with an Alarm LED on the floor plan, and the alarm panels are updated with that information.

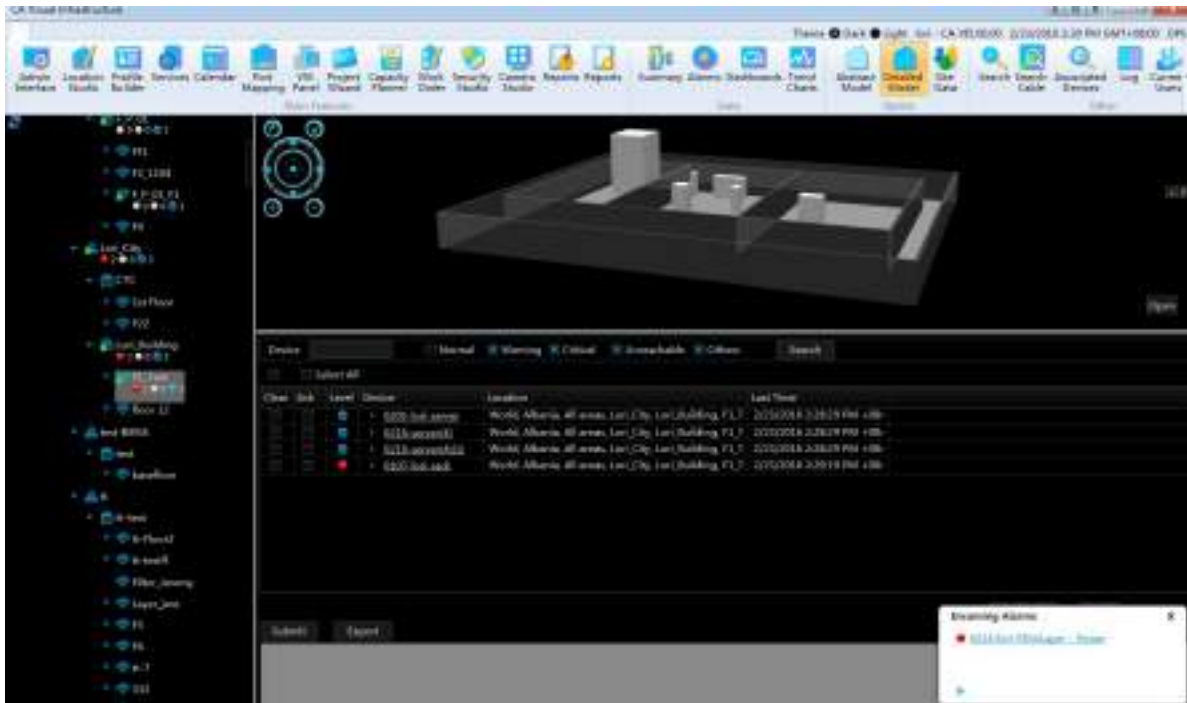
A device can have one of the following alarm states:

- Alarm State Acknowledged
- Warning
- Normal
- Unreachable
- Critical

Each time a device is polled, it returns one of these four states to the system (Acknowledged state occurs only when you acknowledge an alarm). The Alarm Panel provides an easy way to see the overall state of monitored devices and their data elements and polling history.

Note that a device can maintain two other alarm states related to the Critical and Warning levels. When setting a threshold for a data element, you can configure a Min Time On or Min Time Off setting. When a device reaches a warning or critical value but is still within the Min Time On/Off time settings, the LED displays half green/half red or half green/half yellow if the threshold is set to Critical or Warning, respectively.

The critical and Warning alarm will be popup in the bottom-right corner of 3D client. There is a Config to disable / enable the alarm popup window in the System Settings. The critical and Warning alert sound are same and used the default one. There is a config to disable / enable the alarm sound. This is a new feature that is added or this version.



Active Alarm Panel

You access the Active Alarm Panel on the 3D home page application.

In the Floor Plan Editor mode, a ribbon bar on the right has an Alarms tab. By clicking the tab, a panel opens and shows all Alarm panels that are not in a Normal state by default.

Filter Options

The alarm panel lets you apply a series of filters to the list to limit the items provided in the table.

- Locations – Select either the Current Floor or System radio buttons to view devices only on the currently viewed floor or to view devices managed throughout the application in all locations.
- Device Name – Enter a partial device name in the field provided to return only a list of items that match the partial device name search. The partial name must be the first characters of the device name. Device Name search is not case-sensitive.
- Alarm Level – Check each alarm status to be viewed in the list while executing a search. Devices with a status that match the selected check boxes are displayed. Note that the Normal option shows all devices currently being monitored that are not in an alarm state.
- Last Time – Show the last time that that event for the device occurred.

Clicking the Submit button executes the search command based on the user-defined filter options.

Acknowledge Alarms

System operators can acknowledge an alarm. This action indicates to other users that the alarm has been received and is being addressed.

Follow these steps:

1. Open the Active Alarm Panel and click the check box in the Ack column for all alarms to be changed to an Acknowledged status.

The Select All check box at the top of the list lets you automatically select all alarms in the list.

2. Click the Submit button.

An embedded A is shown in the LED on the device.

Note: After an alarm has been acknowledged, it will continue to have an Acknowledged status until it returns to Normal status. Then, any subsequent alarms for the device will maintain the standard Warning, Critical, or Unreachable status.

Acknowledging an alarm also has an impact on the Notification engine. When an alarm is acknowledged, notification escalations for that device or data element end until it returns to Normal and enters an alarm state once again.

Clear Alarms

System operators can clear an alarm from the list by selecting the check box in the Clear column for all alarms that you want to remove from the list.

Clearing the alarm sets the status of that device/data element to normal. On the next polling interval, the device will reappear in the alarm list if an alarm condition is generated again.

View Detailed Alarm Information

When you highlight the data element under a device, detailed information related to the alarm and alarm condition are displayed in the Detailed Alarm Information section at the bottom of the list.

Follow these steps:

1. Click the Expand button next to a device.
2. Select the alarm.

The bottom of the Alarm Panel window provides a detailed description of how the alarm went into that state.

View Alarm History

A detailed alarm history of each data element for all devices is maintained in the alarm panel.

When viewing the data elements of the device in the alarm panel, do the following:

1. Double-click one of the listed data elements.

The alarm panel shows a list of all alarm states that data element has been in during polling activity. An entry included in this list shows if an alarm has been Cleared or Acknowledged by a user.

2. Access the Alarm History by double-clicking the device's Monitor Attribute that is in the alarm state.

A separate window displays the data history.

- Level – Indicates the alarm state of that device during the period of time defined in the record. If the alarm was cleared or acknowledged, the user name is included in parentheses.
- Alarm Count – Indicates the number of alarm events that occurred for that device-data element at that alarm level.
- Start/End Time – Indicates the time of the initial polling event that resulted in that alarm condition and the last time that condition was returned in the monitoring engine before a new state was reached.

Export Data to an Excel Spreadsheet

Each alarm panel page has an Export button that lets you export the data to a spreadsheet.

To export a list of items to an Excel spreadsheet, click the Export button.

Chapter 11: Port Mapping

The Port Mapping Editor feature lets you create mappings between devices for network ports, power outlets, monitor connections, or all three. If a device does not have a port created on its Device Tab page, the relationship editor does not allow ports to be mapped to that device.

Port Mapping Viewer

The Port Mapping Viewer function lets you graphically view all relationships that a device has for its power, network, and monitor relationships. Each access point to the port mapping tool displays a different tool interface. To view each type of interface, refer to the following sections.

- 3D user interface screen option on the top ribbon bar

Click the Port Mapping button.

- *Device Central*

Each access point to the port mapping tool displays a different tool interface. To view each type of interface, refer to the following sections.

Currently defined relationships for a particular device can be one of two types:

- Power – Device can either provide power to or receive power from another device.
- Network – Device can either provide network to, receive network from, or be a paired network connection.

Port Mapping Tool

Accessing the port mapping tool through the 3D home page opens a new window, which is divided into three sections:

- Port Mapping Filter
- Candidate Devices
- Cable connections

Port Mapping Filter

The left side of the Port Mapping window includes port type, location and device filters. By default, the list will include all devices created in the application from all locations

The Port Type drop down filter menu allows the user to show All ports, Power Ports, Network Ports, Storage Ports or Fiber Ports.

The Location filter allows the user to limit the device list to those from a node in the navigation tree or, if a device is already added to the Candidate Device list, the Floor, Area or Rack associated with the Candidate Device. The following options are available on the Location filter tool:

- All – Show all devices in the device list.
- Current Floor – Only show devices which are assigned to the same floor as the selected candidate device.
- Current Area – Only show devices which are assigned to the same area as the selected candidate device.
- Current Rack – Only show devices which are assigned to the same rack as the selected candidate device.

The following use cases are supported with the Port Mapping tool and the ability to filter the devices in the device list:

- Access the Port Mapping tool from the web interface Ports link or the 3D interface Home Page Port Mapping icon. This will show the All Locations link by default and the user can click to filter to a selected node of the navigation tree. There are no devices in the Candidate Device list.
- If an Available device (not assigned to a floor) is added to the Candidate Device list, then show All Locations in the Location drop down box.
- If an Operational device (assigned to a Floor) is added to the Candidate Device list, then show All Locations, Current Floor, Current Area and Current Rack. Current Area will be displayed by default.
- If more than 1 device is added in Candidate Device list, the search list is filtered by the last selected device on Candidate Device list.

The device list can be filtered by entering a device name in the search field or specifying a number of device attributes. This set of options are accessed by clicking the filter icon next to the search field. After settings have been selected on the filter page the search icon must be clicked to update the device list to match the filtered settings.

Users can also limit the list of devices by entering partial device name searches in the search bar at the top of the device list. The % and * characters are used as wildcard characters to facilitate the device filter process. The list will dynamically update after approximately 1 second of delay in keyboard entry or the user can hit the search icon to force the update to the list.

Add a Candidate Device

The Candidate Devices shows devices that have been chosen by the user and are eligible to accept a port mapping connection. Any device that has a port defined to it can become a candidate device.

To add a device as a candidate device, follow these steps:

1. Locate the device in the Search panel.
2. Right-click and select Add to Candidate Device or double-click the device.

The device is entered as an eligible device for port mapping.

To remove a device as a candidate device, select the X in the top-right corner of the device window in the Candidate Devices window.

Ports highlighted Green have already been connected to another port. Ports highlighted Orange are reserved for a pending move or install project. A port may be connected to multiple other ports only if the System Setting Allow Multiple Port Connections is set to TRUE.

Cable Connections Table

A summary table of existing cable connections for the candidate devices is listed on the bottom, right of the port mapping tool. From this list of connections, users are able to perform the following functions:

- Edit details of an existing connection.
- Delete an existing connection or multiple connections.
- Access device Central information for devices in a connection. Device names are hyperlinks to the Device Central view for that particular device.
- Cable Tier ID identifies the cable tray where the cable will flow
 - If the Cable Tier ID on a cable is the same with the Cable Tier ID on cable tray devices on the floor plan, the cable will go through that cable tray
 - If the Cable Tier ID on both the cable and the cable tray is empty, the cable will go through the cable tray
 - If the Cable Tier ID on a cable is different than the Cable Tier ID of cable tray devices on the floor plan, the cable will direct connect
 - If the Cable Tier ID on a cable is empty, but the Cable Tier ID on cable tray devices is not empty, the cable will direct connect
 - If the Cable Tier ID on a cable is not empty, but the Cable Tier ID on cable tray devices is empty, the cable will direct connect

Create a Port Relationship

To connect two devices through power, you must verify that two devices with the proper ports are in the Candidate Devices section.

To create a new port relationship, follow these steps:

1. Click and drag the port/breaker/circuit to the port/breaker/circuit of the second device you'd like to connect together.

The connection will be automatically saved or you will be prompted to select/provide further information depending on the type of connection.

2. When the connection is created, the consumer and provider columns will be populated with device name hyperlinks. Clicking on a device name hyperlink will open the device central for that device.
3. To edit a connection click on the pencil icon under cables.
4. Only allow 1 cable connected to 1 port. On the UI when user tries to use the same port no change takes place and no warning is displayed but on the import if user tries to use the same port a warning message is displayed on the Scheduler report.

```
Sheet : Instructions
Sheet : Devices
Sheet : Ports
    Row : 4
        Reason: The "Port Name" conflicts.
    Row : 6
        Reason: The "Port Name" conflicts.
    Row : 9
        Reason: The "Port Name" conflicts.
Sheet : Relationship
Sheet : Monitor_device
Sheet : Monitor_target
```

5. Under Tools -> System Settings there is an option to enable duplicate of cables and ports. If port name is duplicated while the option under system setting is disabled then user will not be allowed to add the port and has a message prompt which explains that the port already exists. If the ports are duplicated based on the system setting then while viewing the ports tab under the device, the properties column displays a red exclamation indicating that there are duplicate ports. Similarly, under 3D mapping a red exclamation is displayed.

Model Information

Model Name : 12345-01

UUID : 01234567-8901-1234-5678-901234567890

Power/Link	Energy	Links	Devices	Attribution	Ports
Port Number	Port Type	Name	WIP Port No.	Global Number	Description
		System's Ckt	no 01		
		System's Ckt	no 02		
		System's Ckt	no 03		
		System's Ckt	no 04		
		System's Ckt	no 05		
		System's Ckt	no 06		
		System's Ckt	no 07		

Note: A red arrow points to the 'no 02' row in the table, which has a red exclamation mark in the 'Description' column.



6. Similar to Ports, the system settings also enable user to duplicate cable names. If cable name is unique, it shows a green checked option besides the cable name as below else a red checked option is displayed next to the cable name.

Delete a Port Relationship

To delete a single port relationship, click on the red X under cables in the connections table. To delete multiple connections for a device select multiple rows of the connection table using the Shift key. Right click on one of the selected cables and choose the Delete menu item.

PDU Panel Schedule Link

When viewing a PDU floor mount device in the Candidate Devices section, a link will appear for the PDU Panel Schedule. This link will open a report which details the circuits and breakers configured for the PDU device.

View a Power/Network Path

The self-generated power path and network path for a chain of devices is accessible from the device when it is a candidate device. When viewing the network/power path view, the color of the cable defined when the cable is created will be displayed as the connection line between the devices. In the Power Path view, the user can toggle between Power Phase and Power Cable color views.

To view a network/power path, follow these steps:

1. Promote a device to a candidate device.
2. Select the device Power Path/Network Path.

For a Network Path, the user can right click on an occupied network port and select the Network option to view the network path for that device.

3. Verify that the device is not the highest provider of the network/power in the tree.

If the device is the highest provider of the network/power in the tree, you cannot see the devices that it impacts. The path shows only the devices that affect the selected device.

Note: To view a network/power path on the 3D floorplan, right click the device and select Network Path or Power Path from the menu.

View a Copper, Fiber or Storage Cable in the Network Path

When viewing the network path users can select which type of cable they would like to view; copper, fiber or storage. When a user selects one of these options at the bottom of the page, a number will populate in the network path to show the total amount of a specific cable type for a connection.

Port Manager

Port Manager is a tool that lets you graphically see all the connections made within a rack and all the open ports on the devices within the rack.

To open the Port Manager window, right-click a rack and choose Port Manager from the drop-down list.

The Port Manager window is composed of these parts:

- 2D rack view

The rack port view is a two-dimensional view of the objects located in or on the rack. The ribbon bar at the top of the window changes the view of the rack from front to the rear.

Note: Outlets that are highlighted in green are ports that already have a port connection.

- Physical Equipment

This hierarchical view shows devices located within the rack. The top most device in the list is the rack that is viewable in the 2D view to the right of the list. A list of each device's ports are viewable after the device name is expanded.

- Properties

This table view shows all properties of the device or port that is currently selected in the Physical Equipment list.

- Cables

This view shows a complete list of all the cable connections that are present within that rack.

When Port Manager is initially opened, you are in View only mode, regardless of whether the 3D floor plan was in Edit mode previously. To create within-rack connections in Port Manager, select the Add Cable icon located in the top right corner of the 2D rack image box. (It is the bottom image of the two icons shown. Hover over it with the cursor to confirm).

Make a Connection between Devices in the Same Rack

To make a connection between devices located in the selected rack, network, or power, follow these steps:

1. Select one of the two ports that you are trying to connect.
2. Drag the selected port and drop on top of the second port to define the connection.
3. A window opens and prompts you to complete cable connection attributes.
4. Click the Modify button.

The server is updated with your connections.

Make a Connection between Devices in Different Racks

To make a connection between a device within the selected rack and a device located within a different rack, follow these steps:

1. Select the Search tab on the left side of the Port Manager window.
2. Use the Search function to filter the list and add the target device to the Candidate Device list.
3. Select the desired port from the remote device in the drop-down and also the port from the local device.
4. Drag the remote device port onto the port shown in the rack view on the main part of the screen.
5. A window opens and prompts you to complete cable connection attributes.
6. Click the Modify button.

The server is updated with your corrections.

Edit and Delete Connections

At the bottom of the Port Manager view, a table of cable connections defined for the device in the current view will be presented to the user. Connections can be deleted from this list using the red X icon on cable to delete. Connections can be edited by using the edit pencil icon on the cable record which need to be edited.

Chapter 12: Power Mapping

PDU Panel and Breaker Creation

In versions of the application prior to v4.7.00 all breaker creations were handled in the 2D Web UI of the application. In v4.7.00 and newer the breaker creation will be administered in the 3D Port Mapping tool.

Breakers and panels are created as device entities. By creating breakers and panels as devices, monitoring profiles can be applied at the panel level thus allowing for a simpler way to address a PDU that has one IP address with multiple device IDs differentiating the panels.

Creating a PDU Panel

The following section will address how to create a panel for a PDU, creating of single and three phase breakers through the GUI and through the import spreadsheet.

Prerequisites: A device of the device type PDU will need to be created prior to configuring a panel and breaker.

Follow the below steps to create a panel with breakers for a PDU.

1. Open the Port Mapping section of the application. This can be done one of two ways:
 - Through the ribbon bar Port Mapping icon on the 3D home page.
 - Open the Port Mapping tab in the Device Central of the PDU device that the panel is to be created on.
2. If the Port Mapping module was opened through the 3D home page, enter in the search field the name of the PDU device and add the device as a device candidate by double clicking the device and adding it to the Candidate Device section. If the Port Mapping module was opened through Device Central then the PDU device will be automatically added to the Candidate Device section.

The PDU candidate device will list all ports as well as capacity information for the device. The first row in the Ports section of the device will be the name of the candidate device, capacity of the device, and capacity of the three phases. By hovering over the capacity and phase water bars a popup will display a more in depth understanding of power consumption.

The hover over popup window displays power metrics. Below is a list of those metrics and a description of where they are statically assigned and for the calculated metrics a description of how they are calculated is provided as well.

- Phase – will list the phases that are being used.
 - Capacity – the power capacity for the device. This metric is set for the Power – Available attribute in the Attributes section for the device in 2D Web UI. The capacity of the individual phases will be a third of the capacity set at the device.
 - Consumed – the power being drawn from the device.
 - Available – the power remaining, Capacity minus Consumed.
 - Utilized – the percentage of power being consumed out of the capacity.
 - Voltage – the voltage set at the power source device.
 - Amperage – The amperage set at the power source device.
3. Right click on the device name in the Ports table and select the Add Panel button to create a panel.

The Add Panel window will appear prompting the user for information to describe how the panel is to be configured. Below is a list of the attributes the user needs to define.

View Mode

- Double Table – a panel that consists of two columns with 21 circuits in each column
- Single Table – a panel that consists of one column of 42 circuits

Numbering Scheme

The user only has the option to define a double table's number scheme, a single table has a scheme of 1-42 in one column.

- 1, 3, 5... - an option available only if a double table is selected. This option will have all odd circuits in the left column and all even circuits in the right column.
- 1, 2, 3... - an option available only if a double table is selected. This option will have 1-21 circuits on the left column and 22-42 on the right column.

Department

The default owner for every circuit in the panel. If the user changes the department at the breaker level the owner of the circuit will change only.

- Panel Name – name of the panel
- Capacity – the default capacity for each breaker in the panel. This can be overwritten at the breaker level if not all breakers are the same size.

Panel name

The name of the panel.

Power Rated

The power rating for the entire panel. This value will populate the Power – Rated attribute for the panel device.

Power Derated

The power derated value for the entire panel. This value will populate the Power – Derated attribute for the panel device. If the Power – Derated value exceeds the Power – Derated value of the PDU that the panel resides on the user will receive an error message prompting them of the overage. The user has the ability to allow the overage.

Current Rated

The current rating for the entire panel. This value will populate the Current – Rated attribute for the panel device.

Current Derated

The current derated value for the entire panel. This value will populate the Current – Derated attribute for the panel device. If the Current – Derated value exceeds the Current – Derated value of the PDU that the panel resides on the user will receive an error message prompting them of the overage. The user has the ability to allow the overage.

Volts

The voltage for the entire panel. This value will populate the Voltage attribute for the panel device.

4. Once the panel is submitted a device by the name of the panel that was submitted will be created and placed in the device list. A panel has been created and now breakers can be added to the panel.

Breaker Creation

Breakers, just like panels, when created will automatically have a device created and made available in the device list. Breakers in v4.7.00 can only be of single phase or three phase power. Two phase is not supported currently.

Prerequisites: A panel for a PDU will need to have been created. Refer to Creating a PDU Panel to create a panel if one is not already created.

The below steps will demonstrate how to create a breaker on a PDU panel.

1. Open the Port Mapping section of the application. This can be done one of two ways:
 - Through the ribbon bar Port Mapping icon on the 3D home page.
 - Open the Port Mapping tab in the Device Central of the PDU device that the panel is to be created on.
2. If the Port Mapping module was opened through the 3D home page, enter in the search field the name of the PDU device and add the device as a device candidate by double clicking the device and adding it to the Candidate Device section. If the Port Mapping module was opened through Device Central then the PDU device will be automatically added to the Candidate Device section.
3. For the panel that a breaker is to be created for, right click on the panel name in the Ports table for the PDU candidate device and select the Add Breaker button.

The Add Breaker window will appear prompting the user for information to describe how the breaker is to be configured. Below is a list of the attributes the user needs to define.

- Name – name of the breaker
 - Department – owner of the breaker. This will override any department set for this breaker at the panel level.
 - Type – 1 Phase, 2 Phase, 3 Phase
 - Circuit # - the number of circuits to be included in the breaker. If the breaker is single phase, only one circuit can be defined. If the breaker is three phase the first circuit must be defined, then the remaining two circuits will be populated based upon the numbering scheme that was defined for the panel. If a specified circuit is already being used, an error will prompt the user.
 - Current Rated – Rated current of the breaker
 - Current Derated – derated current of the breaker.
4. Select the Add button to submit the breaker.

If the breakers ampere value added with the other breakers ampere of the panel exceed the Current – Derated of the panel the user will be prompted of the overage. The user can allow the overage. The breaker will be created in the device list.

Port Mapping with Breakers

To associate a device to a breaker follow the below steps.

Prerequisites:

- A panel for a PDU will need to have been created. Refer to Creating a PDU Panel to create a panel if one is not already created.
- Breakers will need to have been created. Refer to Breaker Creation to create a breaker if one is not already created.

The below section will demonstrate how to create a PDU smart panel.

1. Open the Port Mapping section of the application. This can be done one of two ways:
 - Through the ribbon bar Port Mapping icon on the 3D home page.
 - Open the Port Mapping tab in the Device Central of the PDU device that the panel is to be created on.
2. If the Port Mapping module was opened through the 3D home page, enter in the search field the name of the PDU device and add the device as a device candidate by double clicking the device and adding it to the Candidate Device section. If the Port Mapping module was opened through Device Central then the PDU device will be automatically added to the Candidate Device section
3. In the Search Panel to left of the Candidate Devices section search for the device that is be connected to the breaker of the panel under the PDU device. Add the device to the Candidate Devices section by double clicking the device in the search results field.
4. Click and drag either the breaker from the panel to the power port of the end device or the end device power port to the breaker of the panel. This will create a relationship between the two components.
5. Upon making the relationship between the two devices the Port Mapping Tool window will appear prompting the user to provide detail about the connection that was just established. Once all needed information has been edited for the connection select the OK button to submit and save the connection. The application will automatically save once the OK button is selected.

Power Consumption Water Tables

The power consumption water tables refer to the progress bars that are seen in the Port Mapping module for PDUs, Rack Mount PDUs, and in the Power Path module. The below section will explain how to get those values to populate based on connections that are made by end devices (IT devices like Rack Mount PDU, server, switch, blade enclosure, etc.)

Note: In the below example the following devices will be in the power path – server, rack mount PDU, PDU, UPS, ATS, generator/transformer, substation.

1. For all water tables to show values, a substation and/or generator will need to be created. This will ensure that there is an energy source device within the tree. If the power path is to have both a generator and a substation then an automatic/static transfer switch will need to be included.

In this example there will be an ATS that is connected to a generator and transformer. The transformer will be receiving power from the substation.

2. Complete the entire power tree from PDU to substation.
3. For each device ensure that the Power – Available attribute is populated. This should represent the capacity of the device.
4. For the PDU complete the build of a panel. Refer to Creating a PDU Panel for creating a panel.
5. For the panel, complete the build of a breaker. Refer to Breaker Creation for creating a breaker.
6. Connect the breaker to a rack mount PDU.
7. Connect the server (or end IT device) to the rack mount PDU power port.
8. For the server (IT device) to show the rated power, ensure that the following attributes match:
 - If the Selected Voltage dropdown option is 100V for the end IT device, the power rating for the device must be specified at the Power Input@100V attribute.
 - If the Selected Voltage dropdown option is 200V for the end IT device, the power rating for the device must be specified at the Power Input@200V attribute.
 - If the Selected Voltage dropdown option is Custom for the end IT device, the power rating for the device must be specified at the Power Input@Custom attribute.

The rated power from the server will now be applied to the rack mount PDU and roll up to each device upstream in the power path.

9. A power factor can be applied to each device. This is an attribute configured at the device level in the 2D Web UI.

PDU Smart Panel Configuration

Prerequisites: A panel for a PDU will need to have been created. Refer to Creating a PDU Panel to create a panel if one is not already created.

Follow the below steps to create a PDU smart interface.

1. Create the current target members (TM) for the circuits in the Targets sub tab under the Monitor tab in 2D Web UI.
2. After the TMs are created for the circuits, select the Monitor Attributes Manager tab.
3. The TMs that were created for the circuits will now need to be mapped to their respected monitored attributes (MA) that correlate to the circuits in the PDU smart interface GUI. The TMs will be mapped to MAs of the panel that is on the PDU. The list below shows which MA is mapped to which circuit in the PDU smart interface. The P1 stands for Panel 1. There can be a max of six panels (P6).

PDU – P1C01 Current — Current for Circuit 1 on Panel 1

PDU – P1C01 Power — Power for Circuit 1 on Panel 1

PDU – P1C02 Current — Current for Circuit 2 on Panel 1

PDU – P1C02 Power — Power for Circuit 2 on Panel 1

PDU – P1C42 Current — Current for Circuit 42 on Panel 1

PDU – P1C42 Power — Power for Circuit 42 on Panel 1

PDU – P2C01 Current — Current for Circuit 1 on Panel 2

PDU – P2C01 Power — Power for Circuit 1 on Panel 2

4. Map the current TMs to their respected MAs. This can be done at any level - device, type, manufacturer, etc – but it must apply to the panel that is attached to the PDU.
5. Once all TMs are correctly mapped to MAs, turn monitoring on at the panel.
6. Under the Monitor tab for the PDU that holds the panel that is to be monitored, an IP address of 127.0.0.1 must be entered. Select Save. A target doesn't need to be monitored for the PDU. By not monitoring a value the Probe Control table in the 2D Web UI will show the state of the PDU as Inactive. This will not impact monitoring. The Inactive state just symbolizes that the device does not have a target.
7. On the 3D floor plan the smart panel is now viewable for the PDU.

The water bar thresholds are defined as follows:

- Normal: 0% – 50%
- Warning: 50% – 80%
- Critical: 80% - 100%

Chapter 13: Project Wizard

The Project Wizard is an asset-provisioning and management tool that lets project managers do the following:

- Create a project
- Provision the installing, moving, adding, and decommissioning of devices
- Create work orders that summarize the project components
- Send out project work orders

Creating, Editing, Searching, and Deleting a Project

Create a New Project

1. Select Project Wizard icon in 3D home page ribbon bar.
2. Select the New button in the Project List window.
3. Populate the required fields.
4. Project Number must be unique.
5. Expired After End Date checkbox is related to the Project End Date. If the Project, Tasks or Work Orders are not fully completed before the project end date then they will no longer be available to manage. Also, the reserved U Space and port locations related to this project will be released so other projects can utilize that space.
6. Select OK.

A new project is created and now available in the Project List window. The default status is "Pending." It will remain "Pending" until the project has been submitted for approval.

You will now be in project edit mode and can define Tasks which are part of the project.

Edit a Project

1. Double click the project row in the Project List window.
2. Single click the pencil icon next to the project name in the Project List window.

Search for a Project

To search the list of projects that appear on the Project Wizard home page, use the search filter text field in the top left hand corner. Using the wild card character '%' you can add additional criteria to the filter.

Delete a Project

To delete a project navigate to the Project List window, select the project's check box that is to be deleted and select the Delete button.

Creating or Deleting Project Tasks

A task is a way to categorize actions. Actions are composed of installation, move, or decommissioning of rack mounted assets. A task is a grouping of any combination of the three types of actions.

To create a task, follow the below steps:

1. Select the Task icon in the Project Viewer window.
2. Select the Add button.
3. Provide a name for the task. Select the OK button.

A new task will be created under the Tasks icon.

To delete a task, follow the below steps:

1. Select the Tasks icon in the Project Viewer window.
2. Select the task check box(s) that are desired to be removed.
3. Select the Delete button.

Creating Task Actions

Actions are defined within a task. An action is something that happens to a device. The three types of actions are: installation, move, decommission.

- Installation

The installation of a device can either take place with an existing device that already exists within inventory but currently does not reside on a floor plan or it can be the installation of a new device. If the installation of a new device is the action, the device will be created through the project. The Location Level can be set for a rack By Floor or By Area.

- Move

The moving of a device can only take place with a device that currently resides within a rack that sits on a floor plan. The Location Level can be set for a rack By Floor or By Area.

- Decommission

The decommissioning of a device removes the device out of inventory.

- Action List

When displaying the actions list users can sort by Device Name, Type, Model or Location Rule

To add actions to task, follow the below steps:

1. Create the task.
2. Select the task that the action is to be created in.
3. Select the Add Action button.
4. Select action type: installation, move, decommission.

Note: If installation is the selected action, select whether it's new or existing.

5. Select the device(s) that is (are) to be added to the project and select the Add button.

To remove a single device from an action, select the device to be removed and select the Delete button.

To remove all devices from an action, select the Clear button.

6. Select the OK button once all actions have been added.

To add actions to a task through Excel follow the below steps:

1. Select the Export button to export the Task Import Spreadsheet if needed.
2. Populate the spreadsheet with needed information.
3. Select the Import button on the Add Action page to import the action list.

The action list will appear in the Add Action page.

Submitting and Approving a Project

For a project to move past creating tasks and assigning actions to tasks the project must be approved. For a project to be approved one of the following actions must take place:

- An assigned approver of the project must approve the project.
- The project creator must approve the project (only if the project creator is of the Administrator user group)
- An Administrator user group user must approve the project.

Submitting a Project

1. The project creator submits the project for approval by selecting the Submit Project button on the created task page, or on the Project Viewer summary page.
2. Select the appropriate watchers and approvers and select OK.

The list of approvers and watchers is composed of all users in the application.

- Watchers of a project can only view the project.
- Approvers of the project approve the project.
- All users that were selected as approvers will receive an update under their task list on the 3D home page.

Project Status will update to “Pending Approval.”

Device status will change for devices in the project:

- Installation: Existing Device – Available to Reserved Available
- Installation: New Device – Reserved Procurement
- Move: Original Device – “Operational” to “Operational Move”, Shadow Copy gets created and status to “Reserved Move”
- Decommission: “Operational/Available” to “Plan Decommission”

Approving a Project

Approving a project will allow the project creator to assign locations to devices with planned actions within the project. Only the approvers selected by the project creator and users of the administrator user group will be able to approve the project. For a user to approve a project that was appointed to them, follow the below steps:

1. Select the task in your 3D home page task list. This will navigate the user to the page where they can find the Approval button.

Opening the Project Wizard window and editing the project will allow the approving user to take action on the project.

2. After verifying the projects content, select the Approve button.

3. The status of the project will change to “Approved” the project creator will receive a notification within their task list that a project has been approved.

Action Location Assignment

Once the project has been approved the project creator can commence with the project. The next step is to select a location for the asset to be placed if it is an installation or move, or if the device is selected for decommission the decommission specs must be assigned.

Select the approved task, to view the list of actions within the task. The three types of actions are described in detail separately below.

Installation Location Assignment

To select a location for the installation of a new or existing asset, follow the below steps:

1. Select the check box(s) next to the devices that you wish to set the location for. If you select more than one, the location rule (if no exact RU is selected) will apply to all devices.

There are two ways to place a device. Note, some devices can be placed on the floor (i.e. Racks, Air Conditioners, etc.) and others will be placed in the Racks (i.e. Servers, Switches, etc.) The Set Location and Auto Plan features will vary slightly based on the type of device selected and the value of the attribute Mount Type for the device. Options for the Mount Type attribute are Floor Mount and Rack Mount.

- Set Location – tell the system to find a spot in a rack based on location criteria: building, floor, rack row, or the exact RU.
 - Building – a building that was created in location studio
 - Floor – a floor within a building
 - Area – an area within a floor
 - Rack group – This will display all groups of racks that have the Rack Group attribute populated.
 - Rack Row – This will display all rows that have racks on them. For a rack to be in a row, the rack must be in an area that has a grid defined.
 - Rack – the exact rack you want the device to be in.
 - Rack Position – the exact RU the device is to be placed in.

When setting a rack position, blanking panels present in the rack view that have the U Blocker device attribute set to ‘False’ will not be seen in the rack view. This will allow users to mount the asset into the rack where

there is currently a blanking panel device. If the user selects a U position which overlaps the blanking panel where the U Blocker setting is set to False, the asset will be placed in the rack, the blanking panel will be removed and a Work Order will be created to remove the blanking panel from the rack as part of this asset placement.

If the blanking panel takes up more than the size of the device to be placed does, the entire blanking panel will be removed and the gaps will not be populated with additional blanking panels.

When you set "Location by Rack" option as against the prior version where just the Front was available and the device that could only be placed in the front. This version supports both sides of the rack [front and back] and when user tries to place device on the rack, the system will calculate to see if the device will collide with any other devices that are already in the rack and display a message to user.

- Auto Plan – the system will scan all racks and find a rack that fits the device's requirements. If you plan to select a rack this way, continue to step 3.
- After a location rule has been specified, select the Auto Plan button. This will ask which rack filters are to be applied to the location rule specified. The five filters are:

Power Availability

Does the racks RPDU have enough power (kW) remaining to supply the device.

Power Ports

Does the rack have enough power ports remaining either locally with the selected rack or are there ports reserved for the selected rack located within another rack. It only applies this filter if the device requires power ports. If you do not wish to apply this filter and want the filter to skip this option, uncheck the option.

Power ports will be shown available for a rack if:

- The power ports of a power strip are located within the selected rack.
- The power ports have been reserved to the selected rack through the Port Allocation tool in the 2D Web UI.

Network Ports

Does the selected rack have enough network ports remaining either locally or are there ports reserved for the selected rack located within another rack? It only applies this filter if the device requires network ports. If you do not wish to apply this filter and want the filter to skip this option, uncheck the option. If you leave this checked it will create a network port connection to the switch/blade if the device has a network port.

Network ports will be shown available for a rack if:

- The ports are on a switch that is located in the selected rack.
- The ports of a switch have been reserved to the selected rack through the Port Allocation tool in the 2D Web UI.

Storage Ports

Does the selected rack have enough storage ports remaining either locally or are there ports reserved for the selected rack located within another rack. It only applies this filter if the device requires storage ports. If you do not wish to apply this filter and want the filter to skip this option, uncheck the option. If you leave this checked it will create a storage port connection to the storage device if the device has a storage port.

The ports are on a storage device that is located in the selected rack.

The ports of a storage device have been reserved to the selected rack through the Port Allocation tool in the 2D Web UI.

Rack Weight

This isn't shown as a filter option but is a default filter applied to all racks. To edit the rack weight allowance, edit the Rack Weight Capacity attribute for the rack.

2. If you receive a failed message, select the Details button to find the reasoning why no rack was a match. You may need to broaden your search. Continue until you find a rack that fits. If you receive a successful message and select the Details button, you will find the results. Below is a brief description of each section in the Details window.

Plan Results Details

This area shows the rack along with all other racks that met the same requirements as the rack that was selected. If you wish to change the rack, select the Change Rack button. You will be once again be asked to select the filter options you want to apply to the rack.

Power Port Connections

- Power Port Assignment - This area is divided up into separate port sections. The port sections correlate to the number of power ports listed by name that the device has. By default if the user selected Power Ports as a filter and the device has at least one power port on the device, one of those ports will be connected. This connection can be modified/deleted. The list of Power Port Assignment devices are all power strips that are available for use for the selected rack.
- Power Summary – This area shows not only the power reading of the power strip you will be plugging the device into but shows the power reading of all devices upstream from the power strip. There are three categories shown for each device on both the kW side and Amps side:
 - Capacity – the power capacity of the device

- Actual – the real time power reading of the device (if the device is set to monitor it will show the Layer – Power value, if the device is set to static it will show the Power Output @‘voltage’)
- Result – the to be power reading when installing the device (actual power plus the power rating of the installing device)

Network Port Connections

This section shows the number of network connections that the installing device has. The list of network devices show all network devices that are available to the selected rack. The below list shows the different ways switches become available to the rack.

- Switch is directly located within the rack
- Switch ports are allocated to the selected rack. The switch will appear within the list and the user will need to define the patch panels that are to be placed in between.
- Switch is connected to a patch panel located within the rack. If you select the Patch Panel button you will see the switch with the in between patch panel connections.

Patch Panel Setup – The user has the option to connect patch panels in between the installing device and the end network device. To add patch panels in the network setup, follow the below steps:

1. Select the Patch button.

The window that appears shows a list of all devices on the left hand side and on the right the current configuration of networking setup, device and network device. To add a patch panel in between, locate the patch panel in the list and add it to the list on the right by selecting the Add button.

2. Ensure all patch panels are added and the correct in and out ports have been defined and select OK.
3. Once all details are complete, select Submit Actions button. Once selected, the check box next to the Action Type column will turn to a flag, signaling the action has been submitted. To learn how to approve an action, refer to the Approving an Action section. Once the action has been approved by the selected approver when the project was submitted, a work order will be able to be created.
4. Once the approver approves the action, the device will move into the “Reserved State.” When a device is in the reserved state, a blanking panel will be placed in the RU position that was selected during the location assignment and also any and all port assignments that were created will have their ports reserved as well with a gold plate.

Moving Location Assignment

To select a location for the moving of an existing rack mounted asset, follow the below steps:

1. Select the check box(s) next to the devices that you wish to set the location for. If you select more than one, the location rule (if no exact RU is selected) will apply to all devices. There are two ways to place a device:
 - Set Location – tell the system to find a spot in a rack based on location criteria: building, floor, rack row, or the exact RU.
 - Building – a building that was created in location studio
 - Floor – a floor within a building
 - Area – an area within a floor
 - Rack group – This will display all groups of racks that have the Rack Group attribute populated.
 - Rack Row – This will display all rows that have racks on them. For a rack to be in a row, the rack must be in an area that has a grid defined.
 - Rack – the exact rack you want the device to be in.
 - Rack Position – the exact RU the device is to be placed in.
 - Auto Plan – the system will scan all racks and find a rack that fits the device's requirements. If you plan to select a rack this way continue to step 3.
2. After a location rule has been specified, select the Auto Plan button. This will ask which rack filters are to be applied to the location rule specified. The five filters are:

Power Availability

Does the racks RPDUs have enough power (kW) remaining to supply the device.

Power Ports

Does the rack have enough power ports remaining either locally with the selected rack or are there ports reserved for the selected rack located within another rack. It only applies this filter if the device requires power ports. If you do not wish to apply this filter and want the filter to skip this option, uncheck the option.

Power ports will be shown available for a rack if:

- The power ports of a power strip are located within the selected rack.
- The power ports have been reserved to the selected rack through the Port Allocation tool in the 2D Web UI.

Network Ports

Does the selected rack have enough network ports remaining either locally or are there ports reserved for the selected rack located within another rack? It only applies this filter if the device requires network ports. If you do not wish to apply this filter and want the filter to skip this option, uncheck the option. If you leave this checked it will create a network port connection to the switch/blade if the device has a network port.

Network ports will be shown available for a rack if:

- The ports are on a switch that is located in the selected rack.
- The ports of a switch have been reserved to the selected rack through the Port Allocation tool in the 2D Web UI.

Storage Ports

Does the selected rack have enough storage ports remaining either locally or are there ports reserved for the selected rack located within another rack. It only applies this filter if the device requires storage ports. If you do not wish to apply this filter and want the filter to skip this option, uncheck the option. If you leave this checked it will create a storage port connection to the storage device if the device has a storage port.

The ports are on a storage device that is located in the selected rack.

The ports of a storage device have been reserved to the selected rack through the Port Allocation tool in the 2D Web UI.

Rack Weight

This isn't shown as a filter option but is a default filter applied to all racks. To edit the rack weight allowance, edit the Rack Weight Capacity attribute for the rack.

3. If you receive a failed message, select the Details button to find the reasoning why no rack was a match. You may need to broaden your search. Continue until you find a rack that fits. If you receive a successful message and select the Details button, you will find the results. Below is a brief description of each section in the Details window.

Plan Results Details

This area shows the rack along with all other racks that met the same requirements as the rack that was selected. If you wish to change the rack, select the Change Rack button. You will be once again be asked to select the filter options you want to apply to the rack.

Power Port Connections

- Power Port Assignment - This area is divided up into separate port sections. The port sections correlate to the number of power ports listed by name that the device has. By default if the user selected Power Ports as a filter and the device has at least one power port on the device, one of those ports will be connected. This connection can be modified/deleted. The list of Power Port Assignment devices are all power strips that are available for use for the selected rack.
- Power Summary – This area shows not only the power reading of the power strip you will be plugging the device into but shows the power reading of all devices upstream from the power strip. There are three categories shown for each device on both the kW side and Amps side:
 - Capacity – the power capacity of the device
 - Actual – the real time power reading of the device (if the device is set to monitor it will show the Layer – Power value, if the device is set to static it will show the Power Output @'voltage')
 - Result – the to be power reading when moving the device (actual power plus the power rating of the installing device)

Network Port Connections

This section shows the number of network connections that the installing device has. By default if the user selected Network Ports as a filter and the device has at least one network port on the device, one of those ports will be connected. This connection can be modified/deleted. The list of network devices show all network devices that are available to the selected rack. The below list shows the different ways switches become available to the rack.

- Switch is directly located within the rack.
- Switch ports are allocated to the selected rack. The switch will appear within the list and the user will need to define the patch panels that are to be placed in between.
- Switch is connected to a patch panel located within the rack. If you select the Patch Panel button you will see the switch with the in between patch panel connections.
- Patch Panel Setup – The user has the option to connect patch panels in between the installing device and the end network device. To add patch panels in the network setup, follow the below steps:
 - a. Select the Patch button.
 - b. The window that appears shows a list of all devices on the left hand side and on the right the current configuration of networking setup, device and network device. To add a patch panel in between, locate the patch panel in the list and add it to the list on the right by selecting the Add button.
 - c. Ensure all patch panels are added and the correct in and out ports have been defined and select OK.

4. Once all details are complete, select Submit Actions button. Once selected, the check box next to the Action Type column will turn to a flag, signaling the action has been submitted. To learn how to approve an action, refer to the Approving an Action section. Once the action has been approved by the selected approver when the project was submitted, a work order will be able to be created.
5. Once the approver approves the action, the device will move into the “Reserved State.” When a device is in the reserved state, a blanking panel will be placed in the RU position that was selected during the location assignment and also any and all port assignments that were created will have their ports reserved as well with a gold plate.

Decommissioning Assignment

To decommission an asset, follow the below steps:

1. Select the check box(s) next to the devices that you wish to decommission. You can only decommission devices that have an action type of Decommission.
2. Select Auto Plan to complete the assignment
3. Once all details are complete, select Submit Actions button. Once selected, the check box next to the Action Type column will turn to a flag, signaling the action has been submitted. To learn how to approve an action, refer to the Approving an Action section. Once the action has been approved by the selected approver when the project was submitted, a work order will be able to be created.

Set Approval

After an action has been submitted, approvers will need to be assigned to the action. Follow the below steps to set approval.

1. To set approval for an action, select the desired device row in the task action list and select Set Approval button.

NOTE: Assigned approvers and users of the administrator user group will be able to approve actions.

2. A new window will appear. This window will ask for an approver (Assigned To dropdown), a secondary approver if the primary approver does not respond with an answer to the submission within the specified period time (SLA(Days)). Once all the required fields have been populated and added to the list on the right, select the Submit button.
3. To start the SLA time, the project creator or approver will need to select the Start button located at the top of the task page.

Approving an Action

To approve a submitted action follow the below steps:

1. Select the task in the 3D home page task list or open Project Wizard to the appropriate project and navigate to the task with the action needing approval.
2. To approve the single action, select the Approve button after selecting the individual action row in the action list. To approve the entire task, select Approve Task.

If an action is approved that involves the creating of a new device and installing, a calendar entry is created.

3. To reject the single action, select Reject button after selecting the individual action row in the action list.
4. The project creator will now be able to continue the project and be able to create work orders and distribute them accordingly.

Creating and Completing Work Orders

Creating Work Orders

Work orders are a way to formally track and provide detailed information to users of the system. To create a work order for the installation of a device, the moving of a device, or the decommissioning of a device, a project and action will need to be approved. Once the project and action have been approved, follow the below steps to create a work order.

1. Open the project that will need a work order created.
2. Select the Work Orders tab in the navigation tree.
3. Select Add button to create a new work order.
4. Select Add to add a new action to the work order.
5. The listed actions will be all the actions that have been approved within this project. Select the action check box – Decommission/Install/Move – to create a work order with all action components – Equipment Install/Provisioning Network/Provisioning Power – included. To create a work order with individual components, select only the check boxes that apply to the work order.

If a moved device is added to the work order, a work order will be created that will show how to decommission the original device so the user can move it to the new rack RU.

6. Assign the primary approver, secondary approver, and SLA time. The user has the option to select an individual primary approver or assign the work order to a group of users. The group is a list of user groups that are defined in the Web Admin section of the application. All users in the group will receive the notification and will be able to act on the work order.
7. Select the Submit button to send the selected work orders to the assigned users.

Once the submit button is selected a calendar entry is created stating a work order has been created.

8. The user will need to select the Start button to start the SLA time.

Completing Work Orders

As the approver of the worker, you have the option to reject or complete the work order. To finalize a work order, follow the below steps.

1. To take action on an assigned work order, select the work order from the 3D home page task list. This will direct the user to the work order page.
2. If the actions were completed, select the Completed button. If the action was rejected select the Reject button and provide a reasoning for rejection. The project creator will receive these rejections notes. To stop the SLA timer, select Stop. To start the SLA timer, select Start.

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3. If the action is completed, all installing and moving actions will have their reserved blanking panels removed and the devices and port assignments created. If the device was to be decommissioned, the asset will be retired from the application.

Chapter 14: Capacity Planning

The Capacity Planning functions allow users to model data and plan power, space and cooling resources in the application. These features are found at the Capacity Planning icon in the 3D Home Page ribbon bar. There are two core capacity planning features in the application:

- What If Analysis – Allows user to model the impact on power, space and cooling resources based on projects or user defined changes to location.
- Power Project Plans – Allows users to define a set of devices and easily understand the power and space requirements to accommodate these devices in the application.

What If Analysis

The What If Analysis function provides summary data for space, power, and cooling for a given location in the navigation tree. When you are viewing the data for a location, you can model the impact of adding new racks, power devices, servers, or projects defined in the Project Wizard function.

Capacity Information

The left side of the What If Analysis screen displays the navigation tree of locations managed by the application. You select a node in the tree to view the summary data for key metrics based on devices in those locations. These key metrics are grouped in the following sections:

- Site Energy Information – Summarizes the total power and IT loads along with PUE/DCiE ratios.
- Space Summary – Summarizes the rack and port capacity for the selected location.
- Power Summary – Summarizes the UPS, PDU and PDU Rackmount capacity and used power for the location.
- Cooling Summary – Summarizes the cooling capacity for the location.

Model New Devices

You can select new models of devices to assign to a given location and determine the impact to the overall space and power capacity of the floor. You can define a list of models to assign to the selected floor. Alternatively, you can choose the Project option, which provides a list of the defined projects in the Project Wizard tool.

1. Click the 'By Model' or 'By Project' radio button at the top of the screen.
2. Define the list of models or project to assign.
3. Click the Analyze button to see the impact of assigning these devices to the location.

In the summary information screen, new values appear on each line to show the new value of that data point if the devices are added to the location. The % number reported indicates the % Capacity of space or power for each of the data points defined in the summary.

The new values displayed in the table during the Analyze process are color-coded as follows:

- Red lettering indicates that over 100% of capacity is required to accommodate the new devices.
- Green lettering indicates that the new devices do not exceed the stated capacity for the space or power devices in the location.

Plan for the Decommissioning of Devices

The What If Analysis tool lets you simulate what will happen to your data center during the decommissioning of devices. To use the tool, follow these steps:

1. Open the What If Analysis window from the 3D ribbon bar menu.
2. Select the desired location node from the navigation tree.
3. Click the Advanced button to open the Advanced window.
 - a. Check the Decommission radio button and click the search icon to list all the devices on the selected location.
 - b. Check the devices in the list that you want to decommission and click the Add button.
 - c. Click the OK button to see the results.
 - Green means that you are still within capacity.
 - Red means that you have exceeded capacity.


Power Project Planner

Power Project Planner is a tool within the application 3D Client whose purpose is to assist users in determining the overall power and rack unit requirements for a list of devices. By leveraging the expansive model library, users can model power and rack space consumption by adding multiple quantities of selected models to a power project plan. This tool is commonly used to define rack and power distribution needs for racks.

Interface Basics

The Power Project Planner presents information in table lists. The table interface behaves in the same manner for various pages available to the user.

1. The Sort icon identifies which column is currently used for sorting the table list and allows the user to reverse the order
 - a. To sort on a different column, select the column header and the sort icon will appear
2. The second row in the list contains a search field for each column
 - a. The table list will be filtered for items that contain the text string and no wildcards are needed
 - b. Entering text in multiple columns will further filter the results
3. Pagination features allow the user to scroll through the results list in the table. The number of items per page can be defined in the user's Personal Settings menu.

Model  1	Type	Manufacturer	Product Line
Model Name	Server - Ra 2	Dell	Product Line Name
155D	Server - Rackmount	Dell	PowerEdge
165D	Server - Rackmount	Dell	PowerEdge
175D	Server - Rackmount	Dell	PowerEdge
1800 Rack-Mount	Server - Rackmount	Dell	PowerEdge
185D	Server - Rackmount	Dell	PowerEdge
1855	Server - Rackmount	Dell	PowerEdge
195D	Server - Rackmount	Dell	PowerEdge
195DIII	Server - Rackmount	Dell	PowerEdge
195DIII	Server - Rackmount	Dell	PowerEdge

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Model Data

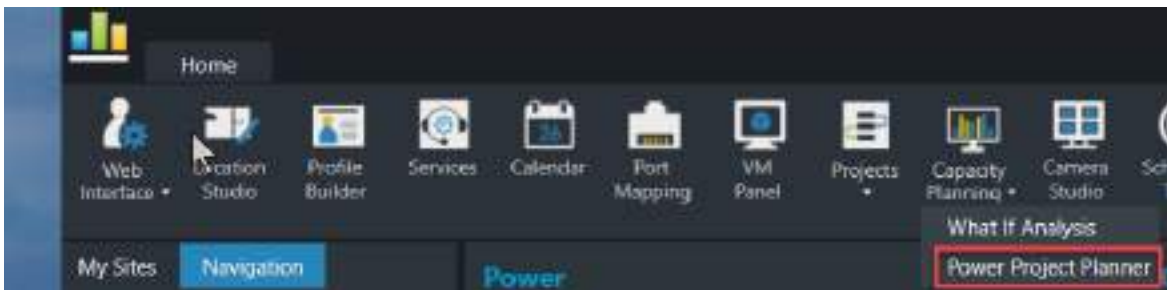
Data in the model library is based on manufacturer specifications and is managed at the Model level of the application. Users may wish to derate or alter the power specifications for given models. This can be done as follows and the model data reported for Power will reflect the new power value.

1. Log into the web interface of the application
2. Choose the Admin link from the top menu bar
3. Select the Model menu from the list on the left
4. Search for and select the model to be edited
5. Choose the Attributes subtab on the main page
6. Scroll to the Electrical/Power section of the attributes list
7. Update the Power – Derated value for the model
 - a. This is the attribute used by the Power Project Planner tool
8. Click Modify to commit the changes for the model

IMPORTANT NOTE: Existing power plans will NOT reflect this change in power values. Users will need to remove and re-add the model and quantity to see the updated values. This change only works for newly defined power plans.

Launching Power Project Planner

From the Home page of the 3D Client under the Capacity Planning icon Select Power Project Planner.



Power Project Plans Main Window

When the Power Project Plan feature is accessed, a list of previously defined plans will be presented in a table. A summary overview of the defined plans will be listed in the table. The following key points related to this page are below:

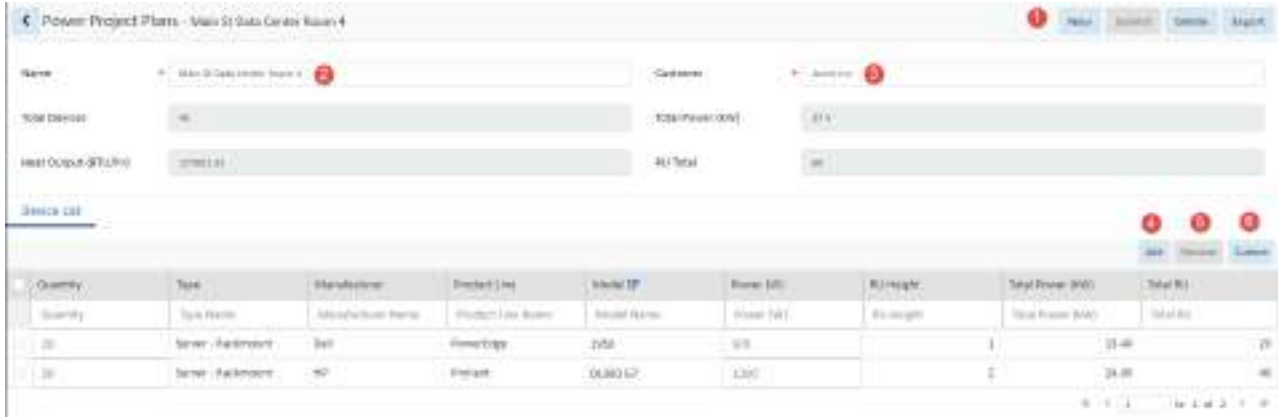
1. Users can only view power project plans they have created
 - a. The admin user can see all project plans
2. New button - Launches a window to create new project plans
3. Delete button - Deletes all projects with check box selected
4. Edit Link – Click the name of the plan to view and edit the details related to the defined plan.
5. Back arrow button will return the user to the previous page
6. Menu button allows user to change the number of records on each page and refresh the data. Note, the number of records per page is a temporary setting for this page. The default setting is maintained in the user personal settings menu.

Name	Customer	Total Devices	Power (kW)	Heat Output (BTU/hr)	RU Total	Creator	Create Date	Modify Date
Plan 2 Name	Customer ...	6	1.98	679.58	0	kelly	2018-09-13..	2018-09-13..
Plan Name	Customer ...	2	2.8	955.96	0	kelly	2018-09-13..	2018-09-13..

Column	Description
Name	Name of the power project plan – click to view details and edit the plan
Customer	Customer name
Total Devices	Total number of devices identified in the project
Power (kW)	Total power needs for all of the devices in kW
Heat Output (BTU/hr)	Total heat output for all of the devices in BTUs per hour
RU Total	Total number of rack units for the devices identified in the project
Creator	Username of the person who created the plan
Create Date	Date the plan was created
Modify Date	Date the plan was last modified

Creating a New Power Project Plan

On the Main Window select the New button and a new Power Project Plan form is opened. The following screen is presented to the user with the functions defined below.



1. The buttons on the upper right perform the following tasks:
 - a. New - Opens a form to create a new project
 - b. Submit - Submit the currently viewed project to the main project list
 - c. Submit & New - Submits the current project and opens a blank form for a new project
 - d. Export - Exports the current project to an Excel spreadsheet
2. Name - Enter the name for the power project plan
3. Customer - Enter the name of the customer
4. Add - Opens a window where devices can be selected from the full set of models supported in the power project tool. Selected models along with the defined quantity will be added to the power project plan detail table.
 - a. Filter the list to find the desired devices
 - b. Select the check box to choose the device and set the quantity. By default, the quantity is set to 1.
 - c. Click Submit to add the devices to the device list in the project
 - Note the Power setting can be edited on the device. In some cases, the power reading for the model in the model library may be based on a high performance power supply, but other power supply options may exist.
 - d. Close will close the window without adding devices to the list

Quantity	Model Name	Type	Manufacturer	Product Line
Quantity	Model Name	Server - Rackmount	Dell	Product Line Name
<input checked="" type="checkbox"/> 0	1050	Server - Rackmount	Dell	PowerEdge
<input checked="" type="checkbox"/> a	1050	Server - Rackmount	Dell	PowerEdge
<input type="checkbox"/> 0	1750	Server - Rackmount	Dell	PowerEdge
<input type="checkbox"/> 0	1800 Rack-Mount	Server - Rackmount	Dell	PowerEdge
<input type="checkbox"/> 0	1850	Server - Rackmount	Dell	PowerEdge
<input type="checkbox"/> 0	1950	Server - Rackmount	Dell	PowerEdge
<input type="checkbox"/> 0	2950	Server - Rackmount	Dell	PowerEdge
<input type="checkbox"/> 0	2950R	Server - Rackmount	Dell	PowerEdge
<input type="checkbox"/> 0	3050R	Server - Rackmount	Dell	PowerEdge

5. Remove - Deletes entries from the table where the check box is selected
6. Custom – Add a new record to the table which allows the user to define a model which is not found in the model library. Users can assign attributes to this custom model as needed to accommodate device requirements.
 - a. Please submit a support request to add this model to the application. This will allow all users to leverage the model list for this model once it is updated in the application.
 - b. Fields are not mandatory. The values assigned to the new custom entry will be used only if they are defined.

Chapter 15: Services Module

The Services module is designed to provide detailed information about an asset as related to warranties, service scheduling and the location history of the device within the application.

Services – Asset Info

The Asset Information tab lets you attach PO and Invoice documents to a device and define advanced device configuration values. You can also add device condition, overall status, and valuation information to a device record on this page.

Note: A device must be selected from the device list before any information can be entered into the fields or saved.

- Device ID – System-derived value based on the creation of the device in the device manager.
- S/N, Asset Tag – Attributes taken directly from the device attributes.
- Mfg Part Number, Part Description, RFID Tag # – Optional input fields.
- Value Options – Specifics about the device condition, purchase date, purchase value, owner, and device status.
- Status – Located in the Value section, states the status of the device: Active, Lost, Decommissioned.
- Notifications – Fields that define the number of days notice needed to notify for Service Events or a Warranty Expiration. Note that the Notification rule still needs to be created before these settings can take effect.
- Comments – Optional field for further describing the device.
- Attached Invoice – Upload copies of the invoice used to procure the device.
- Attached PO – Upload copies of the PO used to procure the device.

To upload files for the invoice and PO features, follow these steps:

1. Click the plus (+) button at the bottom of the file list.
2. Browse to the file name to be uploaded to the system.

To remove a file from the list, click the filename and select the minus (–) button at the bottom of the file list.

To open a file, double-click the filename in the list. A separate window opens to display the file.

Services – Warranty

The Warranty page lets you track Vendors and active dates for both the Parts and Labor components of their device warranties. The dates applied to these warranty components are used to determine if a device is currently covered with an Active, Partially Expired, or No Warranty status. Actual warranty documents can also be attached to this page to provide a document trail for the warranty terms, dates, vendor information, and so on.

- Status – Determined by the combination of the Parts and Labor warranty dates. This field can contain one of these options:
- No Warranty – No dates are defined for either the Parts or Labor dates, or both the parts and labor warranty end dates are in the past.
- Active – Device is covered with active Parts date ranges, Labor date ranges, or both. Note that if only Parts dates are provided, the device can still have an active Warranty state.
- Partially Expired – Both the Parts and Labor date ranges are provided, and only one of the date ranges has expired.
- Warranty Vendor, Claim Phone – Basic contact information for filing a warranty claim.
- Component ID, Serial Number – Detail for only a specific system component covered under the warranty. This value is not the Serial Number of the device stored in the device attributes.
- Start and End Dates – Date ranges for Parts and Labor covered under the warranty.
- Description – (Optional) Additional detail about the warranty.
- Attached Warranty – Lets you upload documents detailing the warranty coverage.
 - To upload a document, click the + symbol at the bottom of the list and browse to the file.
 - To remove a file, click the filename and click the – symbol at the bottom of the file list.

Service Event Scheduling

The Services Tab displays a calendar interface that tracks service schedules related to their devices. This tab includes three components in its overall functionality:

Schedule

The Schedule page lets you create a scheduled event for a device. This event can be a single scheduled event or a recurring event, typically used for device maintenance. The main screen on this tab displays a list of currently scheduled events for the device.

Schedule Single Appointments

To schedule single appointments, follow these steps:

1. Select the device from the Device menu on the left.
2. Click the New button to create a new service event.

A window appears. Required fields are marked with a red asterisk.

Device Name is the actual device name selected from the menu on the left.

3. Type is the Device Type of the chosen device.
4. Choose the Service Type and Device Status for the event to be scheduled.
5. Provide basic information about the Vendor Tech Assigned.
6. Provide the Date, Start Time, and Duration for the service event.

If this is a recurring event, set the Date to the first appointment date.

7. Click the Appointment option for the frequency of the event.

If the event is a one-time event, choose Appointment. If this is a regularly scheduled event, choose the Recurrence option.

8. Do the following if Downtime is required to perform this service event:
 - a. Select the Downtime required check box.
 - b. Provide the Maintenance Window start time and duration, which must be created for the device.

Note: This time is associated with the alarm subsystem. It suppresses notifications for this device during this time period. Any alarm events and notifications during a scheduled downtime are expected.

9. Click the OK button to save the Service event.

Schedule Recurring Appointments

To schedule recurring appointments, follow these steps:

1. Select the device from the Device menu on the left.
2. Click the New button to create a new recurring service event.
Device Name is the actual device name selected from the menu on the left.
Type is the Device Type of the chosen device.
3. Choose the Service Type and Device Status for the event to be scheduled.
4. Provide basic information about the Vendor Tech Assigned.
5. Provide the Date, Start Time, and Duration for the service event.
If this is a recurring event, set the Date to the first appointment date.
6. Click the Recurrence option for the frequency of the event.
7. Define the frequency of the recurring event in the Recurrence Pattern section.
Depending on the option selected, provide the additional information to the right of the pattern options.
8. Define the Start Date for the event and the duration of the recurring event in the Range of Recurrence.
For the duration, you can select no end date, a number of occurrences, or the end date for the event.
9. Do the following if Downtime is required:
 - a. Select the Downtime required check box.
 - b. Provide the start and duration times so that the Maintenance Window can be created for the device.
Note: This time is associated with the alarm subsystem. It suppress notifications for this device during this time period.
10. Click the OK button to save the Service event.
After these events are submitted, they appear in the list on the Schedule tab.

To edit the event settings, double-click an entry from this list.

To remove the event from the schedule for the device, click the event and click the Delete button.

Calendar

The Calendar view provides a list of all scheduled events for a particular device.

To view this list, select the device in the left menu, click the Services Tab, and then click the Calendar sub-tab.

You can use any of the following filters in combination to filter the event list:

- Event Type – By default, the All Items option is selected.
- All Items – Lets you select the active duration. Select the timeframe (Day, Week, Month, and Date Range) to show all items for that particular time selection.
- Overdue – Lets you display all overdue service items for a device.
- Scheduled – Lets you display all scheduled service activity for a device.
- Timeframe – By default, the Day option is selected.
- Day – Shows only items in the current day.
- Week – Shows only items for the current week.
- Month – Shows only items for the current month.
- Date Range – Shows only items for the custom date range.

The detailed event list provides relevant information about the event and the status of the device. The first three columns provide information about the event by using icons to define the status. Placing the mouse over the icons displays the meaning of the icon image.

The first column indicates whether the event time was in the past or in the future.

- Scheduled - Blue
- Overdue - Orange

To provide detail on a service event in the Calendar view, double-click an entry or select a calendar event and click the Add Entry button. A window displays the following fields:

- Vendor, Service Technician, Phone – Specify contact information for the vendor performing the service.
- RMA#, RMA Return Date – Complete these fields if the device or part is being handled with RMA.
-
- Device Status – Select the option that defines the state of the device when this work is performed.
- Work Performed – Select the option that defines the work performed on the device.
-
- Work Completed – Select this check box to indicate that the work has been completed. If the work is still in progress, do not check this box.
- Description – Basic description of work completed.
- Documentation – Lets you upload documentation that may have been provided by the vendor during the completion of this event.
-
- Service Window – Defined service window used for this event.
- Downtime Window – Defines the downtime required to perform this event.

To update the record, apply new values to the fields and drop-downs as required and click the OK button. This event is added into the log history for the device and can be viewed on the [Log](#) (see page 117) tab.

Log

As service events are performed and the corresponding calendar records are updated with details of vendor activities, the specific details for that event are added to the device Service Log which is viewed on the Log tab. This tab provides a consolidated listing of all events performed against the device.

Three options are available for managing these log event items:

- **New** – If an unscheduled event has occurred for a device, add a log event by selecting the New button. You can then add a log event without also adding a scheduled event to the calendar.
- **Modify** – If an existing log event has to be updated, select the event and click the Modify button. Update the information related to the event and click the Save button.
- **Delete** – If a log event needs to be removed from the list, select the event and click the Delete button.

Location History

The Location History tab provides a history of how the device has been managed in the application. As a device is moved from one area or rack to another, the changes to that device location and status are logged in this list.

- **Action** - Three possible Actions can be taken against a device and be logged to the Location History summary page:
 - Available – Device goes from being operational to available.
 - Operational – Device goes from available to being operational.
 - Reassign – Device is moved from one location to another location.
- **Time** – Time the device changed its status or location assignment.
- **Moved By** – user that executed the device move or assignment.
- **Floor, Building, City, State** – Location that the device was assigned to.
- **Floor space, Row, Column, Rack** – Specific information about the location where the device was assigned.

Chapter 16: Device Central

Device Central is an all-in-one window that collects all information on a device. All the attributes within Device Central are specific to the device that was selected.

There are several ways to access Device Central:

- In the floor plan window, select the Data tab and select the Device Central icon
- Select a device on the floor, right click and select Device Central
- Use the search tool and in the results table select the Device Central icon

Summary

The summary tab displays all basic information specific to the Device Central device that was selected. All the information is self-populated from the Device Attributes in the Web Administration Interface. Links to documents or websites are placed in the Links section, located to the right of the basic information. These links are self-populated from the Device Information – Links tab in the Web Administration Interface. Peripheral devices can be added or removed from the peripherals section. Devices can be linked together logically using the Associated Devices section.

When viewing Device Central for a PDU Floor mount device, a link will automatically be displayed for the PDU Panel Schedule. This link will open a report which summarizes the PDU branch circuit monitoring configurations.

Alarms

The Alarm tab in Device Central shows the status of all the alarms mapped to the device. By default, only the alarms that are in warning, critical, unreachable, or other are shown.

To find only alarms in a certain state, click the appropriate state from the filter tab at the top of the window. The filter is not dynamic. The Search button must be selected to apply the filter.

Acknowledging Alarm Condition

The following check boxes are located below the Alarm filter:

- Clear All Alarm (on the left)
- Acknowledge All (on the right)

Selecting one or both box applies that action to every alarm that has that option. For example, selecting the Clear All Alarm box clears all alarms in a warning or critical state. Selecting the Acknowledge All box acknowledges all alarms in a state other than normal and updates the status. You must click the Submit button at the bottom of the window for the decision to take effect.

To acknowledge an individual alarm, go to the desired alarm and select the check the box under the Ack column.

To clear the alarm, select the Clear check box in the Clear column. You must click the Submit button to update and save the status.

Double-clicking an individual alarm opens an alarm history window.

Export Alarms

To generate an Excel file for alarms, click the Export button at the bottom of the page.

The Excel file reads the same information shown on Device Central Alarm tab. It does not print the history of the alarm, but does print the current state of the alarms for that device.

Calendar

The Calendar tab is not dynamic. If the device changes state, the changes are not automatically populated in a new row.

To view new changes to the device, click the Refresh icon.

List View

Two types of calendars are provided in the application. The calendar from the 3D home page shows calendar history from every device in the whole system. The calendar from Device Central shows the history specific to the selected device.

Above the list view, you can filter the calendar by a day, week, month, or a specified period of time.

- Icon – Displays an icon based on the Event.
- Event – Shows the state of the device
- Name – Shows the name of the device
- Start/End Date – Specifies when the event took place and when it ended
- Description – Describes the event

Calendar View

This view of the calendar displays all the alarms, services, and warranties that are specific to that device in a monthly view.

To display the monthly view of the devices past, present, and future status, you must select both the Month tab on the right and the Calendar View tab.

Services

The Services tab in Device Central is a copy of the Services Module. The only difference is that the Services tab in Device Central lists events that are specific to the selected device. It does not show the system as a whole.

See [Services Module](#) for more information.

Warranty

See [Services – Warranty](#) for information.

Dashboards

The Dashboard tab in Device Central shows all dashboards that apply to the selected device. Selecting a Dashboard Name from the list on the left side displays the dashboard on the right side. By default, no dashboard is displayed until it is selected.

Hovering the mouse over a dashboard icon displays a timestamp that shows when the last data point was received.

If no dashboards apply to a particular device, the Dashboard Name list will be empty.

Trend Charts

The Trend charts component enables data to be stored over time and shown in a way that depicts the devices movement in the past.

To view a trend chart, select a monitored attribute from the list under Trend Chart Name on the left side.

A filter above the trend chart provides these options:

- 1 Hour – Show data plotted over a hour. Select a certain hour by adjusting date and time from the Start and End filter.
- 1 Day – Show data plotted over a day. Select a certain day by adjusting date and time from the Start and End filter.
- 1 Week – Show data plotted over a week. Select a certain week by adjusting date and time from the Start and End filter.
- 1 Month – Show data plotted over a month. Select a certain month by adjusting date and time from the Start and End filter.
- 1 Year – Show data plotted over a year. Select a certain week by adjusting date and time from the Start and End filter.

Port Mapping

When you access Port Mapping through Device Central, the Current Device is already created. The Current Device is the device that Device Central was accessed through. The list of devices in port mapping will be filtered to the location of the selected device.

See the chapter [Port Mapping](#) for more information.

Map and Unmap Ports

When a switch or PDU is operational and assigned to a floor by default, its ports are reserved for the device it resides in. You can map new ports to it or unmap ports altogether.

To map new ports, follow these steps:

1. Select the desired ports.

You can select more than one port by holding down Ctrl and clicking on the device. You can also select more than one device by selecting a device and holding the Shift key down and clicking on another device. Every device in between the selected devices will be selected.

2. Click the Map Ports button.

A device filter list appears.

3. Select the device/rack to map the device to and click OK.

The port is mapped to that device.

4. Click Save to log the information.

To unmap a port, follow these steps:

1. Select a desired device or devices.

You can use the Ctrl and Shift keys to select more than one device to be unmapped. For details, see Step 1 for mapping new ports above.

2. Click Unmap Ports to disassociate the ports with a device.

3. Click Save to log the information.

Root Cause Analysis

The Root Cause Analysis page provides these tabs:

- [List View](#)
- [Tree View](#)

List View

The Root Cause Analysis tab provides a tabular view of devices that are upstream from the selected device. You can use this tool to find out which upstream device(s) are tied to a particular device and which devices are affected.

- Alarm Timestamp – When an alarm was last polled.
- Device name/Type/Manufacturer/Product Line/Model – Attributes tied to the device when it was created.
- Location – Where the device is located.
- IP – IP address from Device tab in the Web Administration Interface.
- Hops – Number of hops away from the selected device.

Hop 0 = The selected device.

Tree View

When you select the Tree View tab on the Root Cause Analysis page, the same information that was visible in the List View is shown in the Tree View.

The top device is the selected device (Hop 0). Each tabbed device is another hop from the selected device. Clicking the arrow before the alarm state hides any subsequent device. You can change this by selecting the Network radio button in the top right corner of the window.

Impact Analysis

The Impact Analysis page provides these tabs:

- [List View](#)
- [Tree View](#)

List View

The Impact Analysis tool shows what devices are located downstream from the device that was selected to access the instance of Device Central.

- Alarm – Status of the device.
- Redundant – Whether the device is set up for redundant power.
 - 1 red battery – 0 to 1 power connection to one device.
 - 2 red batteries – 2 power connections to two different power supplies.
- Alarm Timestamp – When an alarm was last polled.
-
- Device name/Type/Manufacturer/Product Line/Model – Attributes tied to the device when created.
-
- Location – Where the device is located.
-
- IP – IP address from Device tab in 2D Web Interface.
- Hops – Number of hops away from the selected device.

Hop 0 = The selected device.

To change the List View to Network Impact Analysis, select the Network radio button in the top right corner of the Impact Analysis window. The Impact Object drop-down menu has three criteria to apply to the List View:

- Application
- Device
- Owner

Tree View

When you select the Tree View tab on the Impact Analysis page, the same information that was visible in the List View is shown in the Tree View.

The top device is the selected device (Hop 0). Each tabbed device is another hop from the selected device. Clicking the arrow before the alarm state hides any subsequent device. You can change this by selecting the Network radio button in the top right corner of the window.

For information about the Impact object, refer to *Impact Object* section in the *Root Cause Analysis* section.

Associated Devices Module

Overview

Users have the option of logically linking devices using the Associated Assets feature in device central. Devices which are linked in this way will move and decommission together.

Creating a Device Association List

1. Click Add under the Associated Devices heading.
2. In the devices window you can filter by Device name, Type, Manufacturer, Product Line, Model, Group, Status, and List Items.
3. After locating the devices you would like to add to the list click on the device and click add, you can also hold CTRL to select multiple or shift.
4. On the right hand side of the window you can provide a name for the device list.
5. When done selecting devices for the list click Submit.

Adding Devices to an Association List

1. Click Add under the Details heading.
2. In the devices window you can filter by Device name, Type, Manufacturer, Product Line, Model, Group, Status, and List Items.
3. After locating the devices you would like to add to the list click on the device and click add, you can also hold CTRL to select multiple or shift.
4. When done selecting devices to add to the list click Submit.

Device names will be displayed as hyperlinks which will launch the Device Central view for that particular device.

Chapter 17: Device Action Keys

Right-clicking a device lets you perform actions, depending on the type of device. These actions range from being able to access Device Central to displaying a 3D view of the Impact Analysis that device has on other devices.

The following items appear when you right-click a device:

- Rack device
 - Port Manager
 - Device Central
 - Impact Analysis
 - Network Path
 - Power Path
- Non-Rack device
 - Device Central
 - Impact Analysis
 - Network Path
 - Power Path

Apply the Impact Analysis Filter

The Impact Analysis option applies a filter to all the devices on the floor and shows all the devices that are impacted by the selected device. If the affected devices are located in a rack, the rack is hidden and only the device is shown.

Follow these steps:

1. Right-click the device.
2. Select Impact Analysis from the drop-down list.

The impacted devices, including the device that was right-clicked, are shown.

To return to an unfiltered 3D floor plan view, select the Layer Filter check box in the top ribbon bar under the Explore tab.

Apply the Power Path Filter

The Power Path option applies a filter to all the devices on the floor and shows all the devices connected by a power connection to the selected device, both upstream and downstream.

Follow these steps:

1. Right-click a device.
2. Select Power Path from the drop-down list.

The filtered devices, including the device that was right-clicked, are shown. If the device connected by a power connection is located in a rack, the rack is hidden and the only the device is shown.

Apply the Network Path Filter

The Network Path option applies a filter to all the devices on the floor and shows all the devices connected by a network connection to the selected device, both upstream and downstream.

Follow these steps:

1. Right-click a device.
2. Select Network Path from the drop-down list.

The filtered devices, including the device that was right-clicked, are shown. If the device connected by a power connection is located in a rack, the rack is hidden and only the device is shown.

Chapter 18: Calendar

Calendar Tool

The calendar tool accessed from the 3D Home Page creates a calendar view of the whole system.

The Calendar Tool has two sections:

- Filter
- Event list

Calendar Filter

Note: Both the Users and Events filter are visible Under the User Activities section, which provides an Administrative view. If you are not an Administrator, the Users filter is not visible.

Two filter categories are as follows:

- User Activities – Check the check box to turn it on. Check it again to turn it off.
 - Events – By default, all events are selected to be shown in the filter. Clicking the blue hyperlink opens a window. Select the Select All check box to include all options in the filter. Select one or more of the user events by clicking the check box next to them. After making all your selections, click Submit button to add events to the filter. Click the Cancel button to cancel selections.
 - All Users – By default, all users are included in the filter. To include certain users in the filter, select the blue hyperlink beside the user. To add a user, click the plus button next to their name. After a user has been added to the Selected Users column, you can remove the user by clicking the minus symbol next to their name.
- Device Activities
 - Events – By default, All Events is selected. This filter shows all device events: Alarm Events, Device Assignments, Service Events, and Warranty Events. To select all events, click the Select All check box at the bottom left of the window. After selecting all desired events, click Submit.

- Locations – By default, All Locations is selected. This filter option shows all locations with the instance. Selecting a location shows only the device within the selected location.
- Types – By default, All Types is selected. The Types filter lets you filter devices by their device type.
- Devices – By default All Deices is selected. This filter lets you select specific devices.

After selecting the desired filters, click the eye glass to apply the filter.

Chapter 19: VM Panel

VM Panel Access

You can access the VM Panel in the application in numerous ways:

- VM Panel Access through Home Ribbon Bar

This option can be accessed through the 3D Home Page ribbon bar. One requirement is that you select the correct floor in the navigation tree. A new window opens to show the VM Panel.

- VM Panel Access through Floor Plan Edit Mode

This option can be accessed through the 3D Floor Plan Edit window. Select the VM tab on the top of the window and click the VM Panel icon on the drop-down. A new window opens to show the VM Panel.

- VM Panel Access through Device Smart Interface

This option can be accessed through the device ribbon bar. When you highlight the device within the rack, the ribbon bar changes priority to the device. Select the Data tab on the top ribbon bar and then select the Smart Interface icon. A window appears and prompts you to select which panel you want to view. Select the VM Panel from the drop-down list to open the VM Panel window.

Navigation

Host/VM

The VM Panel, on the left side, includes two columns:

- Host – Displays the hosts

Depending on how the VM Panel is accessed, different hosts are visible:

- When accessed from 3D Home Page, you see every VM Host in the system.
- When accessed from the 3D Floor Plan Editor, you see every VM Host on that floor.
- When accessed from the device ribbon bar, you see only the VM Host on that device.
- VM – Displays the guests on the highlighted Host name to the left

Tab Bar - Host

This section contains the following topics:

- [Summary](#)
- [Virtual Machines](#)
- [Performance](#)
- [Log](#)

Summary

To view the Hst VM Summary page, select a Host on the left. The tabs are populated. The summary page for the Host is divided into the following sections:

- VM Host – Displays information specific to the Host selected in the Host column
 - Uptime – The time running since last time Host was turned on
 - Model – Host model
 - Manufacturer – Host manufacturer
 - Processor Type – Host's type of processor
 - CPU Cores – Number of CPUs in the Host
 - Number of NICs – Number of NICs in the Host
 - Virtual Machines and Templates – Number of guests located on the Host
 - License – Type of VM
- Commands – Actions you can do to the Host VM
 - Create Virtual Machine – Create a new Guest VM on the Host VM
 - Shutdown – Shutdown the Host VM
 - Reboot – Reboot the Host VM
- Resources – Guest VM resource usage/Host VM total resources available
- Datastore – List of Host VM hard drive disk information

Virtual Machines

The Virtual Machines tab under the Host VM selection shows all the Guest VMs located in the selected Host.

- Name – Name of the Guest VM
- Guest OS – Operating system of the Guest VM
- State – Whether the Guest VM is powered on or powered off
- Provisioned Space (GB) – The amount of hard drive disk space given to the Guest VM during its creation
- Used Space (GB) – Space being currently occupied on the Guest VM
- Host CPU (MHz) – Amount of CPU being consumed from the Host
- Host Mem (MB) – Amount of memory being consumed from the Host
- Guest Mem (%) – Percentage of used host memory being used by guest

Performance

The Performance tab provides real-time trend charts that display performance information specific to the Host VM.

To change which performance view is relevant to your search, click the 'Switch to' drop-down box and select the appropriate performance item.

Log

The Log tab collects and displays a log of actions specific to the selected Host VM to show transactions that have occurred to the Host VM.

- Time – The time when the action occurred
- User – Who created the action
- Description – A description of the action that occurred at the timestamp

Health Status

The VM Health Status is on the VM Host level, and included all the sensors health status. You can refer the URL link below.

http://pubs.vmware.com/vsphere-4-esx-vcenter/index.jsp?topic=/com.vmware.vsphere.dcadm.doc_41/common/hosts/t_monitor_health_status_when_connected_to_vcenter_server.html

- Sensors – Displays all sensors arranged in a tree view. If the status is blank, the health monitoring service cannot determine the status of the component.
- Status – Displays the state of the VM component



Health	Status	Monitoring	URL
Physical			
CPU socket 00 Level-3 Cache @ 20000 B	Normal		
CPU socket 01 Level-3 Cache @ 20000 B	Normal		
CPU socket 02 Level-3 Cache @ 20000 B	Normal		
CPU socket 03 Level-3 Cache @ 20000 B	Normal		
Software Components			
vSphere Health Monitoring Service	Normal		
vSphere Health Monitoring Service	Normal		
VMware Health Monitoring Service	Normal		
VMware Health Monitoring Service	Normal		
VMware Health Monitoring Service	Normal		
VMware Health Monitoring Service	Normal		
VMware Health Monitoring Service	Normal		
VMware Health Monitoring Service	Normal		
VMware Health Monitoring Service	Normal		
VMware Health Monitoring Service	Normal		
VMware Health Monitoring Service	Normal		

Tab Bar – Guest

This section contains the following topics:

- [Summary](#)
- [Performance](#)
- [Log](#)

Summary

To view the Guest VM Summary page, select a Host on the left. The tabs are populated.

The summary page for the Host is divided into six sections (eight including Host and VM which were previously discussed in the section [Host/VM](#) (see page 151)).

- General – General information that pertains to the selected Guest VM
 - Guest OS – The operating system that the Guest is running on
 - VM Version – Version of VM
 - CPU – The number of CPU that the Guest VM is using
 - Memory – Memory allotted to the Guest VM
 - Memory Overhead
 - IP Address – IP address of the Guest VM
 - DNS Name
 - State – Whether the Guest is on or off
- Resources – Resource information that pertains to the Host VM and Guest VM
 - Consumed Host CPU
 - Consumed Host Memory
 - Active Guest Memory
 - Provisioned Storage – Amount of disk space given to Guest VM from Host VM
 - Not-shared Storage
 - Used Storage
- Commands – Commands that evoke the state of the Guest VM
 - Power On/Power Off – Which ever option is shaded grey is the Guest VMs current state
 - Suspend
 - Reset

- Manage Backup
- Move VM
- Clone VM
- Edit VM Settings
- Delete VM
- Notes – A text box that saves notes specific to the selected Guest VM
- Datastore - List of Host VM hard drive disk information
- Network

Performance

The Performance tab provides real-time trend charts displaying performance information specific to the Host VM.

To change which performance view is relevant to your search, click the 'Switch to' drop-down box and select the appropriate performance item.

Log

The Log tab collects and displays a log of actions specific to the selected Host VM to show transactions that have occurred to the Host VM.

- Time – The time when the action occurred
- User – Who created the action
- Description – A description of the action that occurred at the timestamp

Create Virtual Machine

Consider the following before adding a Guest VM on a Host VM:

- What OS will the Guest VM have?
- What amount of the Host VM resources will be allocated towards the Guest VM?
- Where will the Guest VM reside (if more than one disk is part of the Host VM)?

To create a new virtual machine, follow these steps:

1. Select the Host VM in which the Guest will be located.
2. Click Create Virtual machine under the Commands section in the Summary tab.
A new window appears.

Chapter 20: Profile Builder

Profile builder lets you create custom models and create multiple instances of that model in the 3D floor plan. Models can be multiple devices, which means that you can create creating complex rack designs that are used multiple times. The Profile Builder window provides the Explore, Edit, and Rack tabs to help you create custom models.

Create New Model Profile

To create a new model profile, follow these steps:

1. Click and drag the device(s) from the device list and onto the profile canvas.
2. Create the model profile by using the standard floor plan controls.
3. Verify that all attributes of the new model profile are set and click the Save icon.
4. Specify a name for the model and select OK.

Delete a Model Profile

To delete a model profile, follow these steps:

1. Select the Model Profile tab on the left side of the Model Profile window.
2. Select the red X next to the model to be deleted.

Chapter 21: File Depot

The File Depot is located on the Floor Plan page and is used to upload files to the floor plans. These files are available to all users to download and view. The File Depot is typically used for these types of files: engineering plans, user guides, escalation procedures, contact information or other similar types of documentation.

The following are two separate repositories available for users to upload documents:

- Public – Files loaded to the Public section can be viewed on all floor plans.
- Private – Files loaded to the Private section are viewed only on the currently viewed floor plan.

Create Folders

You must be in Edit Mode to be able to modify the File Depot.

Follow these steps:

1. Click the Create link to create Folders in the File navigation tree while viewing the File Depot.

The folder is added under the currently selected node in the tree, and you are prompted for a Folder Name.

2. Specify a name for the folder and click the Submit button.

Upload Files

To upload one or multiple files to the selected folder, follow these steps:

1. Select a file folder in the navigation tree.
The Upload link is available.
2. Click the Upload button.
The Upload File dialog appears and prompts you for a File Name.
3. Click the Browse button.
The Windows File Explorer window opens.
4. Navigate to the location of the file to be uploaded.
5. Select the file and click The Submit button.
The selected file is uploaded to the File Depot.
 - If a file has the same name as an existing file there will be an Error Message indicating it already exists.

Rename Folders and Files

After folders are created or files are uploaded, they can be renamed.

Follow these steps:

1. Select the folder or file that needs to be renamed and select the Rename link in the File Depot.
The Rename dialog appears.
2. Provide a new name for the folder or file and click the Submit button.
Note: You must include the file extension in the new name.

Delete Folders and Files

To delete folders and files that have been added to the File Depot, select the folder or file and click the Delete link. You are prompted to confirm the deletion.

If a Folder is deleted, all files contained in that folder are also removed from the system.

Chapter 22: Security Studio & Camera Studio

The Security Studio module allows users to sync their MileStone cameras and create custom interfaces for viewing within the application.

NOTE: The current supported version of MileStone is 8.1.

The Camera Studio integrates with IP Cameras. All IP cameras support uploading images via FTP. VDC creates a repository for the uploaded images by multiple IP cameras. VDC fetches up-to-date images from its Image server (which can be standalone or same server as Master) to deliver end user real time images.

Sync a Milestone Camera

1. Install Milestone XProtect Professional Management Application.
2. Create a user account for the XProtect application. This will be the access point from which the VI application will authenticate against the XProtect server.
3. Select Wizards → Configure User Access
4. Remember once a user is created you must log out and log back in for the configuration to be applied.
5. Add a camera to the Hardware Device section of the XProtect application.
6. Open VI.
7. Open Security Studio.
8. Select the Add button under the Server section.
9. Provide the server information of the XProtect application.
10. The user information will be the access setup configured in step 2.
11. A list of servers on that Milestone IP will become available.
12. Select the desired server and select “Add Selected Site.”
13. Next step is to sync the cameras on the Milestone server. Select the server name within the server list and choose the “Sync” option.
14. Select the checkbox for the cameras that are to be synced.
15. Provide the device information for the servers that were selected. Select OK to apply the model information.

16. Select the Synchronize button.
17. Once the device is synced, the status will change from “Unsynchronized” to “Synchronized.”

Add a Camera View

Prerequisite: a camera must be synced into VI.

1. Open Security Studio.
2. Select the ADD button just above the PTZ Control section.
3. Select a view layout from the options and select OK.
4. To add a camera to a box, select the Select Camera button.
5. Within the Select Cameras window select the Milestone server from which the camera resides. Select the camera from the Cameras list.
6. Once all desired cameras are added to the fields select the Save icon in the top right hand corner. Camera views can be saved to either individual devices or locations (only floors). Select the desired locations/devices.
7. Select OK to save the camera view.

Add a FTP Camera

Prerequisite: a camera with ftp user must be defined VDC. Please refer to Image server configuration and FTP settings for this.

1. Open Camera Studio.
2. Add a camera group.
3. Add cameras in the group. Cameras that have location info will be listed in the search result now. The ftp users are displayed.
4. Click on confirm to complete.
5. When clicked on the camera group, the cameras will be displayed on the right tab.

Image Server Configuration.

1. Log in Image Server as root user.
2. Run: `cd /opt/VDCIS/bin`
3. Run: `ll`

4. Run: `./addftpuser ftp_user ftp_password`
 - a. ftp_user is the user name of FTP server
 - b. ftp_password is the password of the user
5. Run: `./ftpserver/bin/userManager.sh view`
6. If the user is listed in the result, then the user is created successfully

FTP Settings.

1. Open the FTP configuration of the camera. In Network->FTP configuration, enter FTP address example->`ftp://10.10.10.224/` and port 21 (it's the *image server IP and port*). FTP user name and password is the user name and password that just add in image server.
2. Save the configuration. You can click the Test icon to see if it works.

Chapter 23: Common How To Tips

This How To section is designed to describe in detail how to populate parts of the 3D application and Site Data features. It will also document the components that are used to calculate the values for both.

3D Home Page Summary Table

The 3D home page summary is composed of LED counters, slider gauges, and a table of calculated values. The below table is designed to document each value and how it is calculated.



1. Current PUE

The PUE is defined as:

$$\text{PUE} = \text{Total Facility Power} / \text{IT Equipment Power}$$

The DCIE is defined as:

$$\text{DCIE} = \text{IT Equipment Power} / \text{Total Facility Power} \times 100\%$$



The above image shows four metrics: Current PUE, Current DCIE, IT Power, and Total Power. These values are tied back to devices that have particular MAs defined. These fields are tied to the monitoring attribute. Layer – Power. For monitored data to appear here the target that represents power for the device must be mapped to the Layer – Power MA. Also the Layer – Power MA must be in the watt format. Any/all targets must be in the watt format for this number to be accurate. Formulas may need to be applied to the target to convert it into watts.

***Note: The rest of this document will be assuming all power targets have been properly mapped to the Layer – Power MA.

Total facility power is the total power that is measured at the utility meter. Ideally you want just the amount of power that is supplied to the datacenter.

IT equipment power is the total power that is consumed by the equipment used to manage, process, store and/or route data within the datacenter.

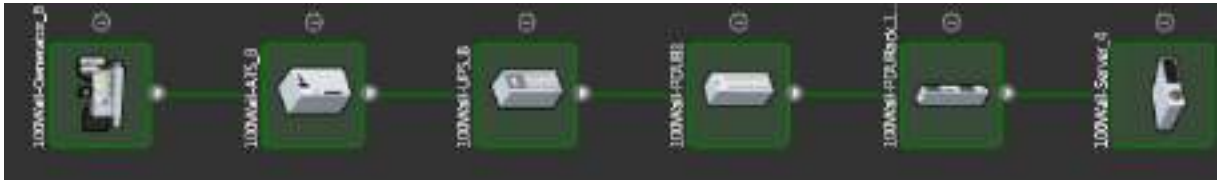
Now that the terms are defined for the metrics, let's see how we show this in the application.

To define a device as facility power in the application, two attributes must be set: Energy Device Type and Energy Data Source.

Energy Device Type is where the device is classified as Energy Source (which is equal to total facility power device) or IT Power (which is equal to IT equipment power device). In an ideal instance you would have one device that is classified in the application as device type energy source (which would provide the number for Total Facility Power) in the above equation and numerous devices like servers, switches, and all other end IT devices will have a device type of IT Power. This usually is not the case as the utility power cannot be measured through IP so it cannot be brought directly into the application or the licensing has not be purchased to do that type of monitoring.

Energy Data Source tells the application how to associate attributes such as power to this device. The two options are static and monitor. If the static option is selected the user can fill in the device attributes and the application will use those numbers when calculating metrics. If monitor is selected, the application will use the monitoring information in the metrics allowing for real time data to be displayed.

Here is a work around that can accomplish the same result. Refer to the below image that shows the power tree.



Total facility power can be thought of as the highest device in the power tree that is being monitored. For example, based on the above tree, the UPS may be the highest device being monitored. By setting the UPS to Energy Source we now have a base unit for our total facility power. There could be more than one UPS, if so all would be set to Energy Source as a data type. Now the Total power metric will be populated in the 3D summary section. Next, the IT Power device types must be defined.

If all end IT devices are being monitored then the device type for all of them can be set to IT Power. If the end IT devices are not being monitored then the next lowest device type can be set to IT Power. For example if the next lowest device that is being monitored is Rackmount PDU's, then all Rackmount PDU's will be defined as IT Power. Now the IT Power metric in the 3D summary will be defined.

***Note: If a device type other than IT equipment are being used as the IT Power, make sure the target that is mapped to Layer – Power is the output power not the input power.

With both IT Power and Total Power defined, the PUE and DCIE will automatically be populated.

2. DCIE

- a. Refer to item one. It documents how to calculate DCIE.

3. Total Power (kW)

Counts all the Device which have a device type of "Energy Source" with Energy data source as (Static and Monitor described below)

If Device Type = 'Energy Source', Energy Data Source = 'Monitor' and if the monitored attribute for this device = 'Layer-Power' It will take the sum of all the Energy Source devices which meet these 3 conditions.

Similarly, if Device Type = 'Energy Source', Energy Data Source = 'Static' and if the Static attribute for this device = 'Power' set at (Power Input@100V/200V) It will take the sum of all the Energy Source devices which meet these 3 conditions.

4. Power Rated

- a. This is the value defined as an attribute for an area. If any node above a child area is selected, the value is a collection of all Power Rated values below it.

5. Power Derated

- a. This is the value defined as an attribute for an area. If any node above a child area is selected, the value is a collection of all Power Derated values below it.

Name: GEN Yard
Color: [Blue] [X] Default
Area Mode: Automatic Manual
Provisioned: Yes No
In Floor: Yes No
Department: [Dropdown]
Power Rated: 0 W
Power Derated: 0 W
OK Cancel

6. Estimated Yearly Power Consumption

- a. Total Power * 24 * 365

7. Estimated Yearly Cost

- a. Electricity price (set in building attributes) * Estimated Yearly Power Consumption

8. Estimated Yearly CO2 Emission

- a. Estimated Yearly Power Consumption * CO2 rate * .001
 - i. There is a CO2 Rate button in the Carbon Emissions report page to set the CO2 rate value.

9. Total Floors

- a. Number of floor on the building selected in the navigation tree.

10. Total / Raised Floor Area

- a. Total – total floor area
 - i. For an area to count towards the entire floor area, the attribute “In Floor” under Location Studio must be set to yes. If it’s set to no, then the floor area for the defined area will be subtracted from the total floor area.

Name: GEN Yard
Color: [Blue] [X] Default
Area Mode: Automatic Manual
Provisioned: Yes No
In Floor: Yes No
Department: [Dropdown]
Power Rated: 0 W
Power Derated: 0 W
OK Cancel

- b. Raised Floor Area – the total square footage (pending on user setting) of raised floor

11. Provisioned / Sellable Raised Area

- a. Provisioned – this is an attribute that is defined in Location Studio for an area.

The image shows a configuration dialog box for an area named 'GEN Yard'. The dialog has the following fields and options:

- Name: GEN Yard
- Color: A blue color swatch with a 'Default' checkbox.
- Area Mode: Radio buttons for 'Automatic' (selected) and 'Manual'.
- Provisioned: Radio buttons for 'Yes' and 'No' (selected). A red arrow points to the 'No' button.
- In Floor: Radio buttons for 'Yes' (selected) and 'No'.
- Department: A dropdown menu.
- Power Rated: A text input field with '0' and a 'W' unit.
- Power Derated: A text input field with '0' and a 'W' unit.
- Buttons: 'OK' and 'Cancel'.

- b. Sellable Raised Area = Total Raised Floor – Provisioned Raised Floor – Common Raised Floor

12. Common Raised Area

- The area size of defined common floor tiles. A tile can be defined as “Common” within the Location Studio floor builder.
- The area is an aggregation of all nodes below it within the navigation tree.

13. Cooling Tons / Cooling Capacity

- Cooling tons * 3.517 = Cooling capacity (shown in kW)
- The collection of all devices with the attribute Cooling – Capacity defined.
- This calculation changes depending on what node is selected in the navigation tree. The farthest that the cooling goes to in the floor. When you select an area, the cooling numbers are based on the floor values.
 - Need to define attribute “Cooling Source” on the device and set to yes for the values to be aggregated towards total cooling tons

14. Cooling Utilization

- Total Actual Power / (Tons Cooling * 3.516)

15. Total / Managed Racks

- Total Racks on the node selected. All nodes below it will be added up for the total.
- Managed Racks

16. Total Devices / Monitored Devices

- Total Devices – total number of devices in the asset library that are currently placed on the floor plan.
- Monitored Devices – total number of devices that the probe is communicating with.

Site Data

Site Data will mainly show data like space, power and cooling at a glance for a given site. Below is summary of data that is populated in Site Data.

Site Data			
Power		Space	
Power Rated	Sum of areas Power Rated	Total Racks	Total Number of Racks
Power Derated	Sum of areas Power Derated	Total Front U Space	Sum of all Rack Unit Capacity
Total Actual Power	Energy Device Type = Energy Source Energy Data Source = Static / Null -> Static Attribute Power Energy Data Source = Monitor -> MA Layer - Power	Front U Space Used	Sum of Rack front Used Unit
Power Utilization	Total Actual Power / Power Derated	Front U Space Remaining	Total Front U Space - Front U Space Used
Cooling		Front U Space Utilization	Front U Space Used / Total Front U Space
Total Chiller Units	Number of Chillers	Total Floor Space	Total Floor Area
Total CRAC Units	Number of Air Conditioners	Raised Floor Space	Raised Area
Cooling Capacity Tons	Tons - Capacity (Tons)	Common Floor Space	Common Gird amount * 4 (By default)
Cooling Capacity kW	Tons - Capacity (kW)	Provisioned Floor Space	Provisioned Area
Required Cooling kW	Total Actual Power	Sellable Floor Space	Total Floor Space - Provisioned Floor Space
Cooling Utilization	Required Cooling kW / Cooling Capacity kW	%Provisioned	Provisioned Floor Space / Total Floor Space



Chapter 24: Uninstall

To uninstall the client from Windows navigate to Start --> Control Panel --> Uninstall a program --> Right Click on the application and choose uninstall. The uninstall wizard will open and guide you through the uninstall process.