Server Technology

Sentry : Solutions for the Data Center Equipment Cabinet

# Sentry Power Manager (SPM)

## Quick Start Guide

• SPM Release 5.3

### Instructions

This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

### Dangerous Voltage

This symbol is intended to alert the user to the presence of un-insulated dangerous voltage within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

### Protective Grounding Terminal

This symbol indicates a terminal that must be connected to earth ground prior to making any other connections to the equipment.

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As a general policy, Server Technology does not recommend the use of any of its products in the following situations:

- life-support applications where failure or malfunction of the Server Technology product can be reasonably expected to cause failure of the life-support device or to significantly affect its safety or effectiveness.
- direct patient care.

Server Technology will not knowingly sell its products for use in such applications unless it receives in writing assurances satisfactory to Server Technology that:

- the risks of injury or damage have been minimized,
- the customer assumes all such risks, and
- the liability of Server Technology is adequately protected under the circumstances.

The term life-support device includes but is not limited to neonatal oxygen analyzers, nerve stimulators (whether used for anesthesia, pain relief or other purposes), auto-transfusion devices, blood pumps, defibrillators, arrhythmia detectors and alarms, pacemakers, hemodialysis systems, peritoneal dialysis systems, neonatal ventilator incubators, ventilators (for adults or infants), anesthesia ventilators, infusion pumps, and any other devices designated as "critical" by the U.S. FDA.

## Notices

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# Table of Contents

# Chapter 1: Introducing Sentry Power Manager (SPM)

SPM is a 1U appliance and software package (also available as a virtual solution) capable of monitoring, measuring, and trending multiple Cabinet Distribution Units (CDUs) in an IP-based enterprise network. From a single user interface, SPM offers control and management over networked devices from a global view down to a specific device-level view.

**SPM as a 1U (Standard) Appliance (APP)**

**SPM as a 1U (Dual-Corded Redundant) Appliance (APPR)**

For information about a virtual SPM (APPV), see the APPV Virtual Solution

## Product Features

SPM provides numerous features for enterprise-wide device management; some key features include:

- Power monitoring at the inlet or outlet level
- Power consumption for capacity planning and efficiency
- Environmental monitoring for all connected sensors
- Green initiative support for PUE and DCeP metrics
- Continuous measurement at any device level
- Remote monitoring and control over multiple data centers
- Choice between a 1U appliance or a virtual solution
- Custom workspace views created by each SPM user
- Load balancing of 3-phase circuits across cabinet, zone, or UPS
- Centralized energy-related alarms
- Support for IPv6 addresses and support for SNMPv3
- Graphical trending and predictive analysis to detect future issues
- Sophisticated diagnostic support package

## Where to Get More Information

Whether you are new to SPM or you're ready for more information, Server Technology provides a number of useful product resources to get you up to speed fast.

### Server Technology's Technical Support

Fast Access to SPM Support:
Contact SMARTER Technical Support

### SPM Product Information

SPM Product Data Sheet:
SPM Quick Sheet

SPM Product Page:
SPM Product Page

SPM Download Center (download a brief SPM demo):
SPM Downloads

Get a Free Trial Version of SPM:
SPM Trial Version

### Setup Instructions for the SPM 1U Appliance

SPM Hyper***fast*** Setup (for basic SPM appliance setup – APP):
APP Setup Instructions

SPM Hyper***fast*** Setup (for redundant SPM appliance setup – Part #SPM-APPR):
APPR Setup Instructions

### Information about Virtualization

SPM Hyper***fast*** Setup (for the SPM Virtual Solution – APPV):
APPV Virtual Solution

### Server Technology Website

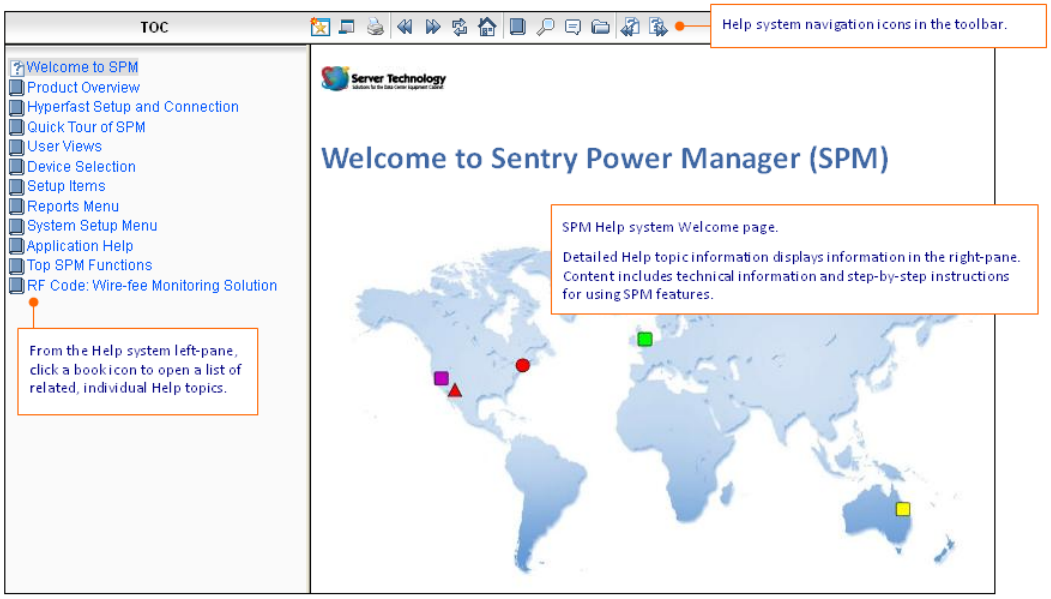
World Leader in Power Management Products and Solutions:
Server Technology Website

## SPM Online Help System

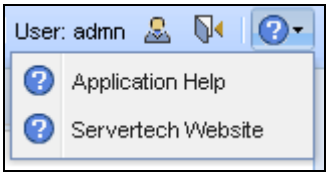
SPM includes an online Help system integrated with the SPM interface. The Help System provides information about SPM features, common tasks, and functional, step-by-step screen illustrations to show you how to work with the interface. The Online Help System is available from within SPM at the following three locations:

### *Location 1: Online Help Main Page*

Open **SPM > Application Help > On-Line Help System**, the SPM Welcome page displays in the right-pane and the Help System Table of Contents (TOC) displays in the left-pane, as follows:

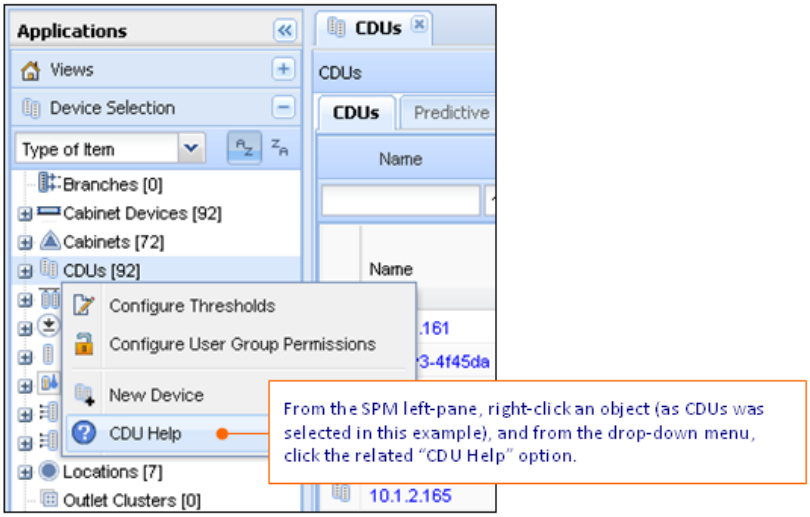



The Help system is also available on the SPM page in the upper right corner of the window by clicking . The options provide access to the main Application Help page and to Server Technology's website.



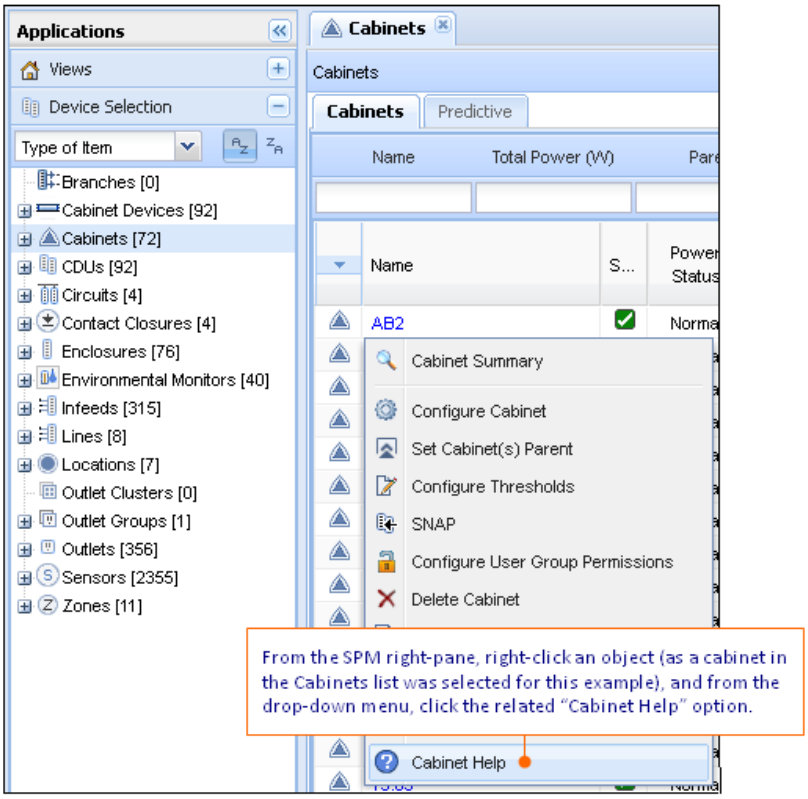

### *Location 2: Help in Context (Left-Pane)*

From the SPM left pane, right-click an object:



**Location 3: Help in Context (Right-Pane)**

From the SPM right-pane, click an object to open a list, like the Cabinets list in this example:




## System Requirements

The following requirements are recommended for effective use of Sentry Power Manager (SPM):

### Web Browsers

SPM supports the following web browsers:

- Internet Explorer  10, 9, 8, 7, and 6 (service pack 1)
- Mozilla Firefox 3 - 20
- Chrome 6 - 26
- Safari 5

### Screen Resolution

The following screen resolutions are supported by SPM:

- Recommended screen resolution: 1280 x 800
- Optimal screen resolution: 1440 x 900
- Minimum screen resolution: 1024 x 768 (need to hide toolbars or press F11)

## SPM Application Program Interface (API)

The SPM API is a 3rd-party interface integration tool that allows SPM as middleware to communicate and integrate power and environmental data to a Building Management System (BMS) or other data center monitoring and management system.

Using the SPM API allows SPM to stream information to existing systems while still keeping SPM available as designed for the configuration, management, and control of your network of Sentry CDUs. SPM manages a large number of CDUs by saving you the time and effort of working on the IP addresses of individual CDUs.

The SPM API is based on the SOAP and REST industry standard for web service interfaces. A detailed Developer's API Manual is available.

**NOTE:** For more information about the SPM API, contact your Server Technology SPM representative.

## Contact Technical Support


**Experience Server Technology's FREE SMARTER Technical Support**

Server Technology understands that there are often questions when installing and using a new product. Free Technical Support is provided from 8:00 a.m. to 5:00 p.m. PST, Monday through Friday. After-hours service is provided to ensure your requests are handled quickly no matter what time zone or country you are located in.

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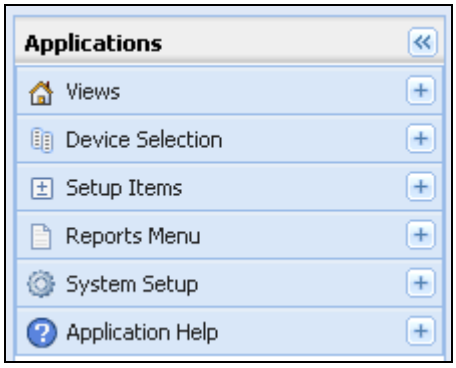
# Chapter 2: SPM Applications and Views Page

This chapter introduces the SPM applications and the Views page.

## SPM Applications

Start working with SPM features by clicking one of the stacked applications in the left-pane of the SPM window, shown in the following illustration. Once a device has been discovered (using Setup Items > Device Discovery), there is no fixed order for accessing applications.

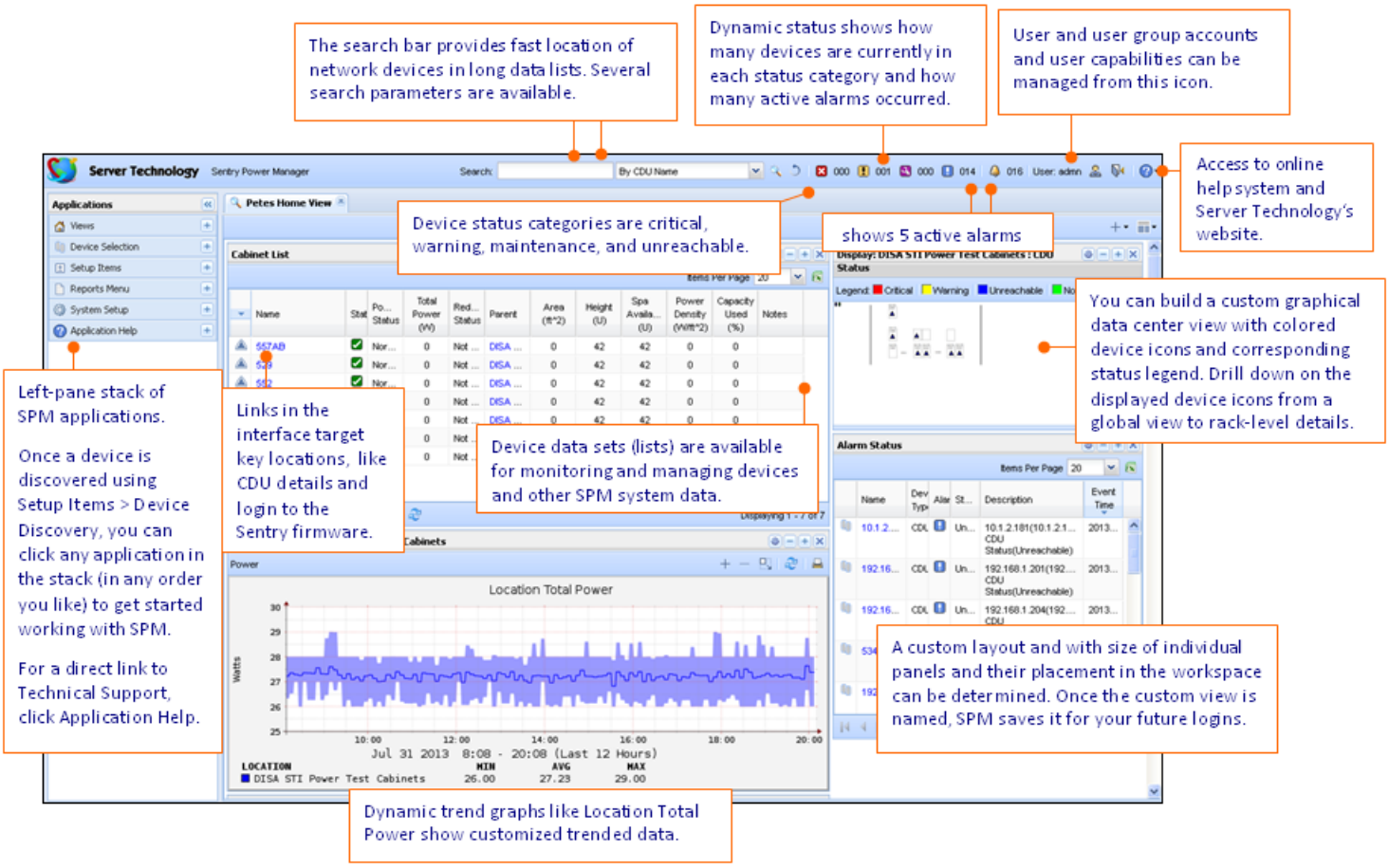



### SPM Applications

| Application Name | Description |
|---|---|
| Views | Graphical workspace with at-a-glance monitoring and management of network devices. Allows customization of your own Views page available by your login. |
| Device Selection | Device list that for viewing and accessing the system objects that can be configured into a device h hierarchy, for example, a CDU within a cabinet, a cabinet within a location, etc. |
| Setup Items | Device list of system objects for quick viewing; same as Device Selection list of objects, but without the internal device hierarchy, so the Setup Items list can be faster to work with. Includes Device Discovery and Scheduled Tasks features. |
| Reports Menu | Allows several types of user reports to be configured and generated with customized parameters. User reports show detailed operational device data collected from CDU readings. |
| System Setup | Provides administrative-level access to settings for the SPM system, predictive analysis, network, email notification, mount point, SNAP default parameters, and other system configuration. |
| Application Help | A collection of several product support options, including a diagnostics package with troubleshooting tools and direct communication with Server Technology's Technical Support team. Access the online Help system, disclosures/agreements, and a product license overview. |

## User Views

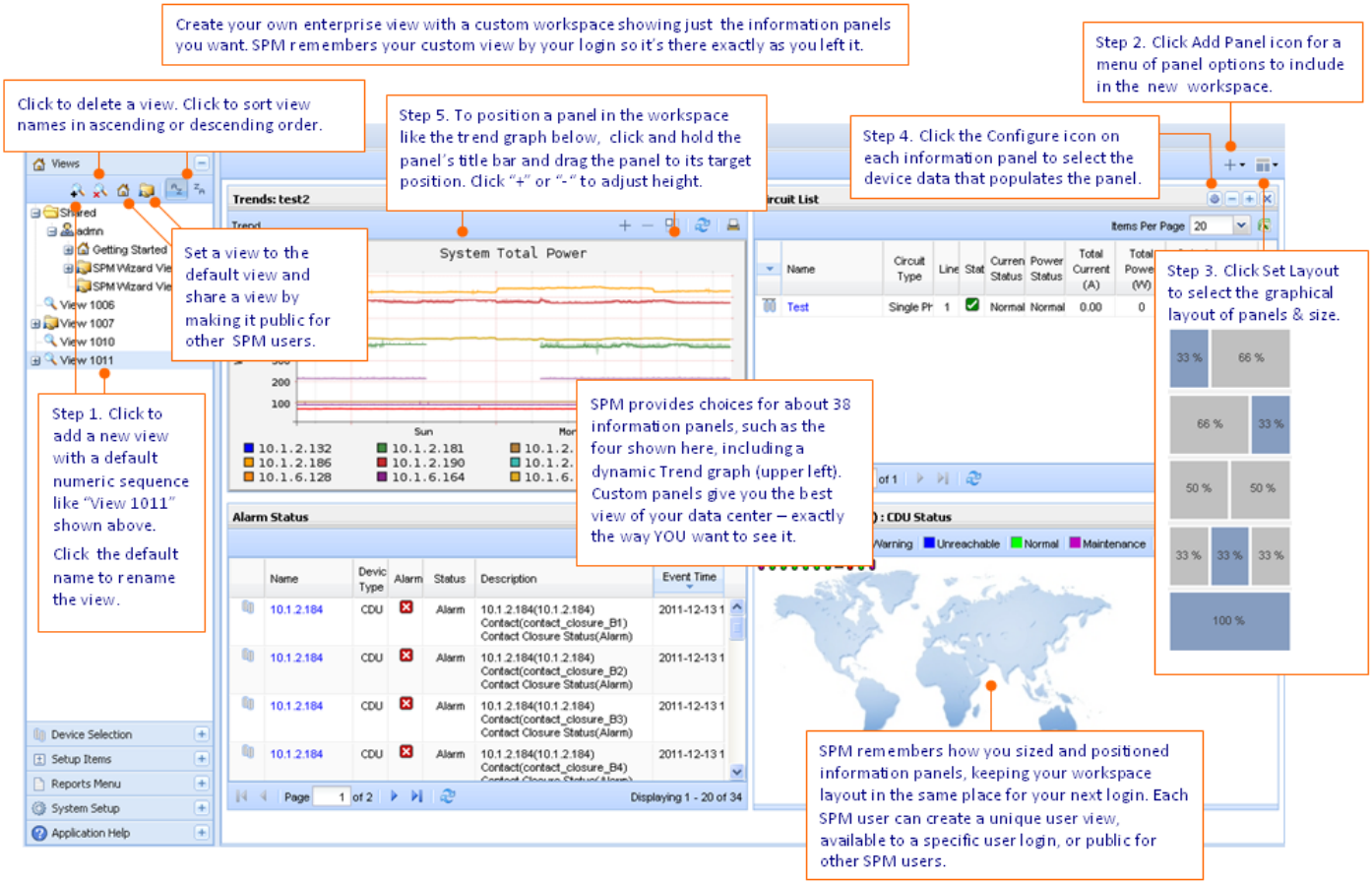
The following example of the SPM User Views page shows key functional areas, controls, and a sample of device operational information.



## How to Customize the Views Page

The Views application displays device panels that show operational data and location-related images for at-a-glance monitoring and management of the data center.

You choose from a wide variety of device information panel types for the type of data you want to see. Then you can customize the panel size and the panel position in the workspace. Once named, your customized Views workspace is saved exactly as you designed it for future logins to SPM.




## Shared (Public) User View

A shared user view is public for viewing by other logged-in SPM users. With a public view you can:

- Set a user view to public (shared) for other SPM users to see.
- Set a public (shared) user view back to private (unshared).
- Set a public (shared) user view as the home (default) view.

## Default (Home) User View

A shared user view is public for viewing by other logged-in SPM users.

- The default (home) view is the first user view that displays upon SPM login.
- Set a default user view to a public (shared) user view for other SPM users to see.
- Set a default user view back to a non-default user view.
- Set a default view to a public (shared) user view.

**NOTE:** Only one user view (shared or private) can be the default view at a time.

### *User View Icons*

The following icons show status of user views:

| | |
|---|---|
|  | Private View (not shared) |
|  | Shared View |
|  | Do Not Share View |
|  | Set Default View |
|  | Remove Default View |
|  | Shared View and Default View |

# Chapter 3: Getting Started with SPM

This chapter presents the features of SPM to help you

## SPM Getting Started Page

When the SPM interface opens, a Getting Started page displays by default to guide you to the most common tasks and how to access them.

### *For SPM Users:*

| *If you want to do this ...* | *follow this path in SPM ...* |
|---|---|
| Contact Server Technology Technical Support | Application Help > Technical Support. |
| Change your password | Top panel on SPM page > My Account > select Change Password tab. |
| Create a new user view | Views > Add New View > select default name and click to rename > customize view as described next. |
| Customize your workspace on the Views page | Views > select a view > Add Panel to choose device data panels > Set Layout to choose workspace layout percentages. |
| Arrange device icons on a location map | Device Selection or Setup Items > Locations > select location > CDU Status tab > Arrange Icons > position icons on map using edit panel controls. |
| Work with system objects (CDUs, cabinets, circuits, sensors, zones, etc.) | Device Selection or Setup Items > click a system object to open list > right-click object in list > select a menu option (or click the same toolbar icon) to perform a user action. |
| Create a new user report | Reports Menu > Reports > New User Report > enter report parameters. |
| Create a new graphical trend report | Reports Menu > Trends > New Trend > enter trend report parameters. |
| Control outlet power (Off, On, Reboot) | Device Selection or Setup Items > select CDUs > select CDU in list > Outlets tab > Outlet Control tab > select outlet in list > click in Control Action field > select command. |
| View list of devices with alarms | Device status bar > click a status category: Critical, Warning, Maintenance, or Unreachable. |
| Configure thresholds | SPM system object list (such as CDUs list) > select object in list > Configure Thresholds > click in edit fields with green corner > edit value. |

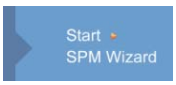
### *For SPM Administrative-Level Users:*

| *For the SPM Administrator* | |
|---|---|
| Discover network devices | Setup Items > Device Discovery > New Discovery > enter parameters. |
| Add a single device | Device Selection or Setup Items > select CDUs > New Device > enter parameters. |
| Schedule an SPM task | Setup Items > Schedule Tasks > New Scheduled Task > enter parameters. |
| Configure SPM | System Setup > System Setup > click a configuration tab > enter parameters. |
| Set up users and user groups | Manage Users > select Users tab (or User Groups tab) > select for user or for user groups > enter user or user group parameters. |
| Configure system object permissions by user group | System Setup > Manager Users > select User Groups tab > select a Regular user group in the list > click Configure User Group Permissions > select system object in drop-down menu > select object in list > click in User Group Permission field > edit the permission. |
| Add an SPM license | System Setup > Add License > enter license key from Server Technology. |

## SPM Wizard

The SPM Wizard is an optional and fast way to get you up and running with SPM.

**NOTE:** To use the SPM Wizard, you will need user capabilities that allow running a device discovery.

From the SPM main page, click 

to open the following dialog box:

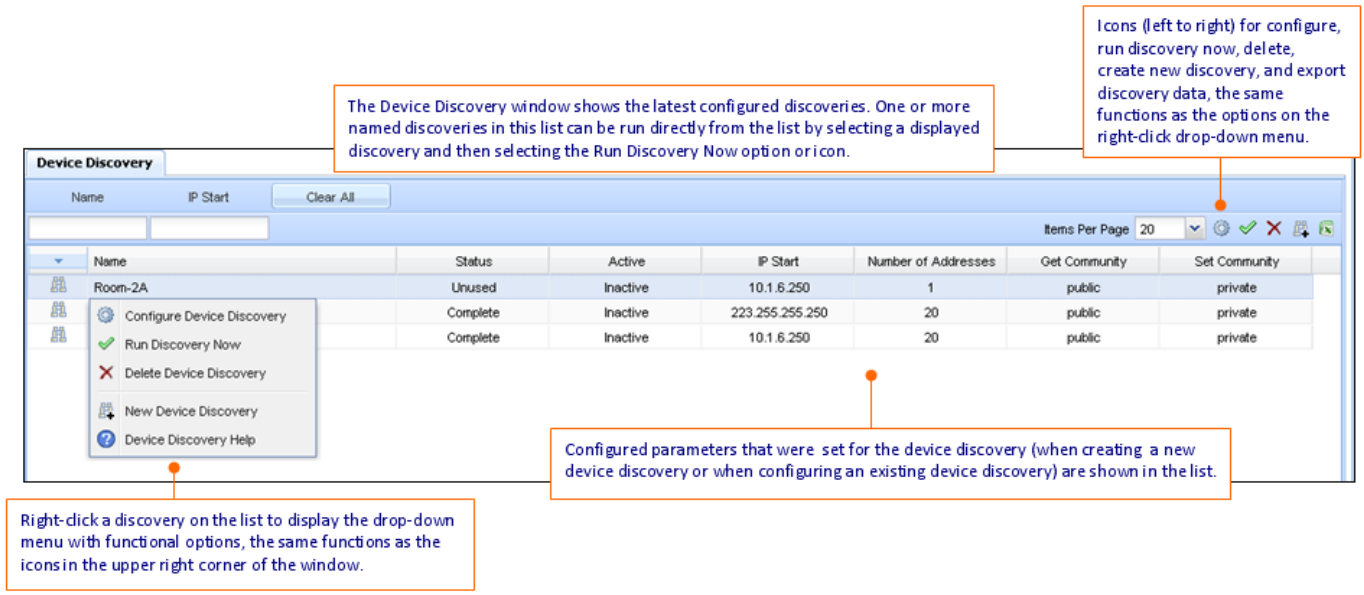

Provide the beginning IP address and the number of addresses in the desired range, select options for SNMP, and click **Run**. The SPM Wizard discovers devices, automatically creates a user view, and then populates that user view with device data.

## Discovering Network Devices

The Device Discovery feature defines the parameters to manually add a device (discover a device) to the network. A discovery process allows specified CDUs and other devices to be recognized by SPM for network communication. Use Device Discovery for initial discovery of devices when SPM is installed, and when adding individual devices or a range of devices to SPM as necessary for the network.

You can discover a single device or discover a range of devices with the Device Discovery feature, which also provides two run options: running the discovery immediately or holding the discovery to be run later.

Select **Setup Items > Device Discovery** to display the Device Discovery window. The following graphic shows the list and illustrates the Device Discovery functions.



### *Device Discovery Options*

SPM provides three options for running a device discovery:

- Immediate new discovery (add) if you choose to run now.
- New discovery (add) held if you choose to run manually at a later time.
- New discovery (add) held if you choose to run as a scheduled task using Setup Items > Scheduled Task. The Scheduled Task option allows you to specify the run frequency, data, and time.

## Adding a Device to SPM

A CDU (or other network device) can be added to SPM in two places:

- From the CDUs list with New Device dialog box, or
- From Device Discovery with the New Discovery dialog box.

An individual device, or a range of devices, can be added to SPM (using the New Device or New Discovery function), as described in the following table:

| Do this Add function…. | with CDUs > New Device… | or with Setup Items > Device Discovery > New Discovery… |
|---|---|---|
| Add a CDU/device to SPM | Only one device added at a time by a single IP address | One device or a range of devices added at one time. Number of devices determined automatically by the "n" you provide for ending IP address. |
| Add competitive devices to SPM | Yes | No |
| Set SNMP parameters | Yes | Yes |
| Select a SNAP template | Yes | Yes |
| Apply a custom template | Yes | No |
| Set a parent for the CDU/device | Yes | Yes |
| When is CDU/device added to SPM? | Added immediately to SPM when device is created. | (1) Immediate new discovery (add) if you choose to run now, (2) New discovery (add) held if you choose to run manually at a later time, (3) New discovery (add) held if you choose to run as a scheduled task using Setup Items > Scheduled Task. |

## Creating an Administrative Account

This task shows you how to grant administrative capabilities to a new user account while protecting the SPM default administrative account **admn**.

**NOTES:**

- The SPM default administrative user is the **admn** user account. (There is no "i" in the **admn** name/password.) The **admn** user can grant full administrative access level rights to other Administrator user groups. The **admn** user account cannot be deleted or demoted.
- For security it is recommended that you first use the default **admn** user account to grant capabilities to another administrative user group, and then associate a new user with the new administrative user group.
- Use the new administrative user account to change the password "**admn**" for the default **admn** user account.

### SPM User Group Capabilities

Capabilities are the predefined levels of user group access to SPM system objects as granted by the SPM administrator (or power user) to individual user groups. SPM recognizes the following user group capabilities:

### SPM User Group Capabilities

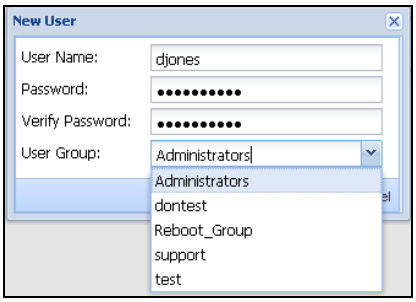
| Level | Capability |
|---|---|
| Administrator | The Administrative user group has full access for all configuration, control (On, Off, Reboot), status, and serial/pass-thru ports. |
| Power | The Power user group has the same capabilities as Administrator but with no user setup capabilities. |
| Regular | The Regular user group has partial access for outlet action control (On, Off, Reboot), outlet status, and pass-thru of assigned outlets, outlet groups, outlet clusters, and serial/pass-thru ports. The Administrator has options for the Regular user's default access: No Access, Off, On, Outlet Control, Reboot, Setup, and View Only. |

### *How to Create the New Administrative Account*

1. Login to SPM using the default administrative account:

   Username = **admn**
   Password = **admn**

2. Select **System Setup > Manage Users**.
3. From the Users List, click the New User  icon.
4. In the New User box, provide username and password.
5. From the User Group drop-down list, select the Administrators option, as shown:




6. Click **OK**. The new user displays in the Users List as a member of the Administrators User Group with Administrator capabilities.
7. Login to SPM using the new administrative account/password you just created with administrative capabilities.
8. Select **System Setup > Manage Users**.
9. From the Users List, select the admn account and click the Configure User  icon.
10. In the Configure User box, change the username **admn** to another name.
11. Provide a password for the new username.
12. Click **Save**. The administrative capabilities of the default **admn** user account are now protected under the new username.

## Building a Graphical Data Center

The Locations application gives you the tools necessary for the review and management of networked devices. Locations, in the form of graphic images, such as a state map or a data center floor layout, are the background that displays on the Views page.

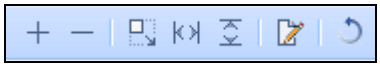
The administrator builds a graphic representation of the data center with icons for sub-locations, cabinets, and CDUs. Location images represent the customized levels of your data center, such as buildings, floors, and rooms.

### *How to Create the Data Center Image*

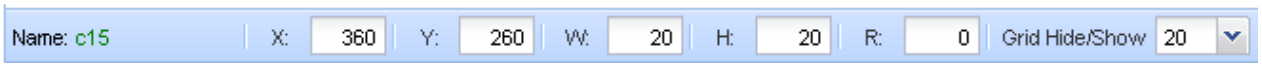
Go to **Device Selection > Locations** to display the Locations list.

From the list, create a new location or select an existing location from the list.

Select the CDU Status tab for a close-up of the layout and the device icons. Notice the toolbar for graphics functions:



Click the Arrange Icons  icon. The graphic redisplays in a grid and the location edit panel displays at the bottom showing the device name in the far left Name field, a cabinet named “c15” in this example:

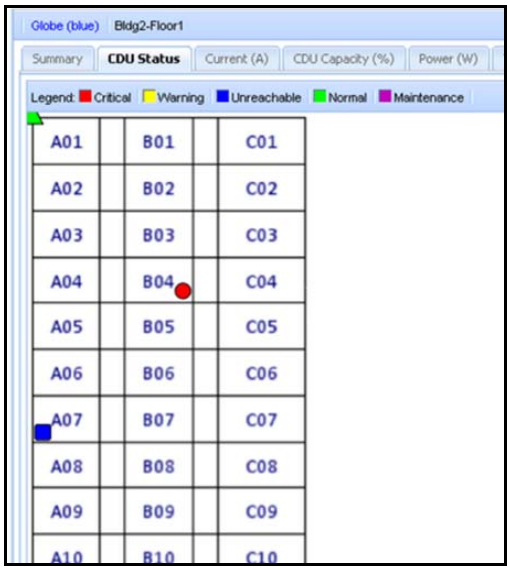



The cabinet icon for “c15” is positioned in the graphic with the X-Y coordinate values. The icon size is obtained with the H-W (width-height) values.

You can rotate the cabinet’s position with a value in the R (rotation) field. Select a value from the drop-down to hide/show the grid.

Click the Save  icon (which changes back to the Arrange Icons icon). Once you save your changes, the icons on the location graphic return to the color of their status condition shown on the legend above the graphic.

In the following example, and based on the legend shown, the colored icons show the cabinet is normal status (**green**), the location is critical status (**red**), and the CDU is unreachable status (**blue**).



## Controlling Outlet Power

This task shows you how to use the SPM Outlets page to issue outlet On, Off, and Reboot (or None) commands on specific outlets or globally on all outlets in a CDU.

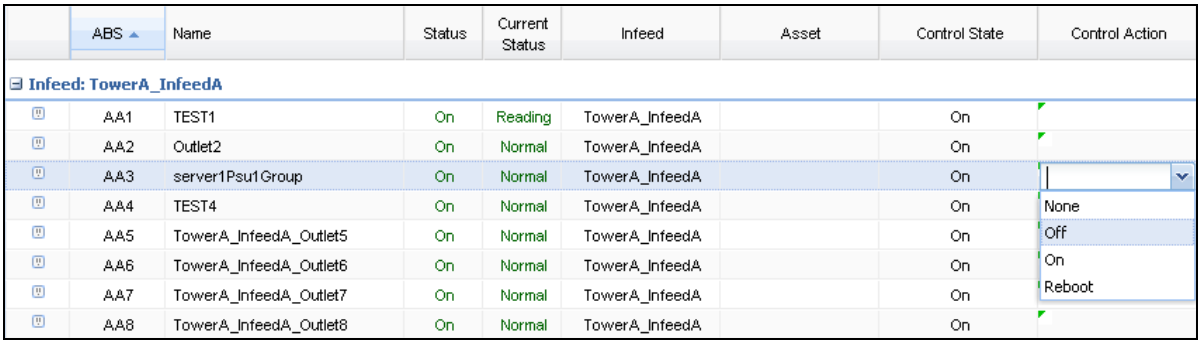
### *Outlet Control Actions*

The following CDU outlet control actions are available in SPM (in the Control Action field):

- **None**: Clears your selection; no action on the outlet will be taken.
- **Off**: Outlet is off.
- **On**: Outlet is on.
- **Reboot**: Outlet is off and reboot action initiated.

### *Issuing Single Outlet Control*

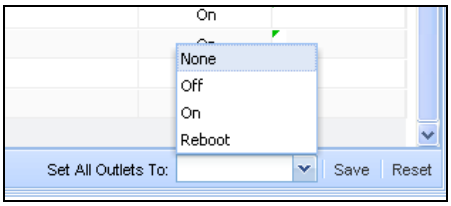
1. Select **Device Selection > CDUs** to display the CDUs list.
2. Select a CDU from the list.
3. Select the **Outlets > Outlet Control** tab. The Outlets page displays the available outlets for the CDU by infeed towers.




4. Select a specific outlet in the list that you want to control. Then click in the Control Action field on the far right.
5. From the drop-down list, select an outlet action command: None, Off, On, or Reboot to issue the command on the selected outlet.
6. Click **Save**. The Control State changes to show the effect on the outlet from the last issued command.

### *Issuing Global Outlet Control*

1. Select **Device Selection > CDUs** to display the CDUs list.
2. Select a CDU from the list.
3. Select the **Outlets > Outlet Control** tab. The Outlets page displays the available outlets for the CDU by infeed towers.
4. In the lower right corner of the window, click in the Set All Outlets To field to display the drop-down menu options:

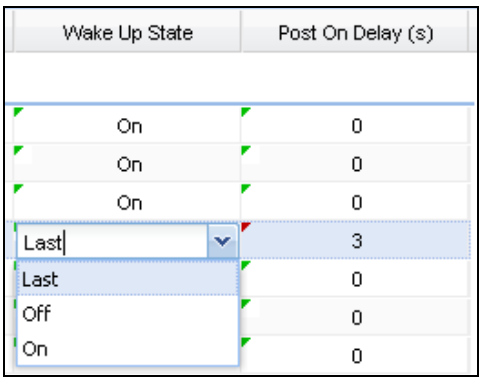



5. Select an outlet action command: None, Off, On, or Reboot to issue the command on all outlets.
6. Click **Save**. The Control State changes to show the effect on all outlets from the last issued command.

### *Outlet Configuration Options*

The values for the outlet Wake Up State (Last, Off, On) and Post On Delay (number of seconds the outlets power on after a CDU restart), can be viewed on the Outlet Configure Thresholds list by selecting an outlet and clicking the Configure Thresholds  icon.

The Wake Up State and Post On Delay can be configured at the CDU Setup > Outlets page.

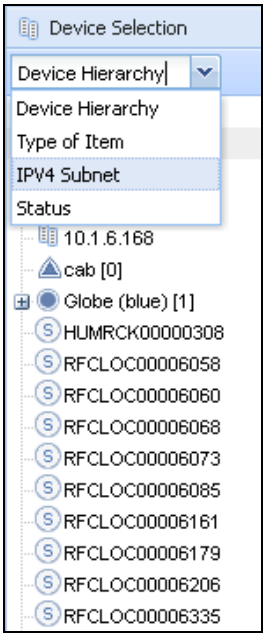


# Chapter 4: Working with Devices

This chapter presents the Device Selection and Setup Items applications for working with devices individually or globally, and covers the Device Discovery and Schedule Task functions.

## Device Selection

Device Selection is an SPM application for accessing system objects in several views, including device hierarchy.




**Device Selection Options:**

**Device Hierarchy:** Shows device-to-parent hierarchy, like CDUs in cabinets, cabinets in locations.

**Type of Item:** Displays a list of devices by device type (in alphabetic order) like Cabinets, CDUs, Circuits, Contact Closures, Lines, etc.

**IP Subnet:** Provides a list of devices by IP addresses (expandable) within IP subnets.

**Status:** Shows CDU IP addresses within the Critical, Maintenance, Unreachable, and Warning status categories.

### *Branches*

The Branches feature is designed for branch current monitoring. The Branches window shows current load levels and allows monitoring at the CDU branch-level instead of monitoring only at the device level.

Each CDU has a fuse or breaker which makes branch-level data monitoring important. If a branch circuit is overloaded, a resulting crash may cause a blown fuse or breaker.

Branch monitoring displays branch status as well as load levels for current and capacity (in amps) to allow faster device management of the branch before a crash can occur.

### *Cabinet Devices*

The Cabinet Devices application lets the system administrator create a collection of cabinet-contained device types within a named cabinet. Cabinet Devices is a simple and accurate way for the cabinet to monitor device-level power and environmental data, placing power management directly within the data center equipment rack.

This allows you to monitor devices that cannot otherwise be easily measured, assisting with cost savings, efficiency of your data center, and capacity planning. SPM lets you select from several types of devices to be included in the Cabinet Devices grouping, such as servers, power meters, environmental units. Reports are available to show the U-spaced used, cabinet redundancy, and cabinet device inventory.

## *Cabinets*

The Cabinets application allows management of individual, user-defined cabinets that contain CDUs and other networked devices. The functions provided by SPM for cabinets include configuring threshold levels for power, capacity, and load measurements, as well as viewing the cabinet's operational data. You can also generate power/current-over-time trend reports for the cabinet.

### Power Modifier

The optional Power Modifier value sets the cabinet's total power. The Power Modifier field is available at **Cabinets > Configure Threshold**.

Power Modifier is a threshold value (in Watts) that you provide for static loads to cabinets. The value you enter for Power Modifier is the known power usage from your own history of device data.

SPM tracks the value (if any) in the Power Modifier field (the static value in Watts that you enter for a cabinet), and then lets you view power usage for all CDUs in that cabinet as part of the total power displayed in the cabinet reports.

### Cabinet Redundancy

The Cabinet Redundancy feature makes it easy to see the power load in a cabinet (both A and B power sides of a CDU). You can see the load against the electrical safety rating. If power is lost, the color-coded bar chart shows the power you have in the moment compared to the capacity of the cabinet and its safety rating.

In the event of a power failure in either the A or B power sides of the cabinet, the dynamic and readily available graphical information assists you in keeping cabinet operations uninterrupted, and prevents tripping a breaker and losing both sides of power. With Cabinet Redundancy, you can increase CDU fail-safe reliability and optimize the cabinet for a higher efficiency of data center resources.

**NOTE:** Cabinet Redundancy does not support all possible CDU product models. For this reason, you may see the message "Not Supported" displayed in a blank Cabinet Redundancy bar chart.

## *CDUs*

The Cabinet Distribution Unit (CDU) application provides monitoring and administrative-level configuration of networked CDUs and other devices, including competitor devices. The functions provided by SPM for CDUs include digital readouts for sensor temperature/humidity readings; setting alarm thresholds; and configuration of all device areas, such as infeeds, environmental monitors, and associated outlets. Also user-configurable are threshold values – low/high temperature, low/high humidity, area, sequence interval, and reboot delay.

## *Circuits*

The Circuits application lets you plan, track, and manage the physical infrastructure of power systems feeding one or multiple CDUs. The Circuits application provides a summarized view of the defined circuit layout in your data center, and makes it easy to determine if a 3-phase circuit is load-balanced based on the load of each line.

### What is a Branch Circuit?

Often when powering racks and cabinets from an electrical distribution panel, multiple infeeds (referred to as "branch circuits") can be run from a single 3-phase circuit to a CDU. The branch circuit infeeds can be single phase, dual phase, or 3-phase circuits.

Each cabinet typically has two separate power infeeds (or "branch circuits") coming into the cabinet: "A" infeed and "B" infeed -- to ensure redundancy -- from different power sources. Each branch circuit/infeed provides power to a single cabinet CDU and its attached devices.

### If You Define a Single-Phase Circuit:

You can assign any infeed that is on your line of power.

### If You Define the Circuit as 3-Phase:

The 3-phase circuit can have up to 3 lines. You can assign multiple 3-phase CDUs to the circuit, automatically creating all the sub-lines of power based on the defined line support for the CDU. You can also add additional infeeds (to cover any redundant power feeds) from other single phase CDUs to the line for additional power monitoring.

### About Load Balancing

The Circuits application analyzes the balance of power, increases efficiency, and ensures that both the cabinet (when using 3-phase circuits) as well as the entire circuit are load balanced, based on the load of each line.

**NOTE:** Server Technology recommends that to ensure redundancy, each cabinet CDU not be loaded to more than 40% of its overall capacity.

## *Contact Closures*

The Contact Closures application allows you to monitor and configure any optional contact closures. A discovered CDU — or an environmental monitor on that CDU — must have one or more connected contact closures or the Contact Closures application will not display in SPM.

Information provided in the Contact Closures application can assist with establishing a customized network configuration; for example, you can gather information in a hierarchy under a named zone. Information about contact closures can also be useful network asset management.

## *Enclosures*

The Enclosures application lets you monitor and configure enclosures. A discovered Server Technology CDU must have a configured enclosure or the Enclosures application will not display in SPM.

Information provided in the Enclosures application can assist with establishing a customized network configuration; for example, you can gather information in a hierarchy under a named zone. Information about enclosures can also be useful network asset management.

## *Environmental Monitors*

The Environmental Monitors application allows you to monitor and configure environmental monitors. A discovered CDU must have at least one connected environmental monitor or this application will not display in SPM.

Information provided in the Environmental Monitors application can assist you with establishing a customized network configuration; for example, you can gather information in a hierarchy under a named zone. Information about environmental monitors can also be useful for network asset management.

## *Infeeds*

The Infeeds application lets you monitor and configure the infeeds on a CDU. A discovered CDU must have recognized infeeds on the unit or the Infeeds application will not display in SPM. The Infeeds application provides monitoring and configuration for infeeds, TRMS data (if CDU is not PIPS), and data for single phase or 3-phase PIPS CDUs.

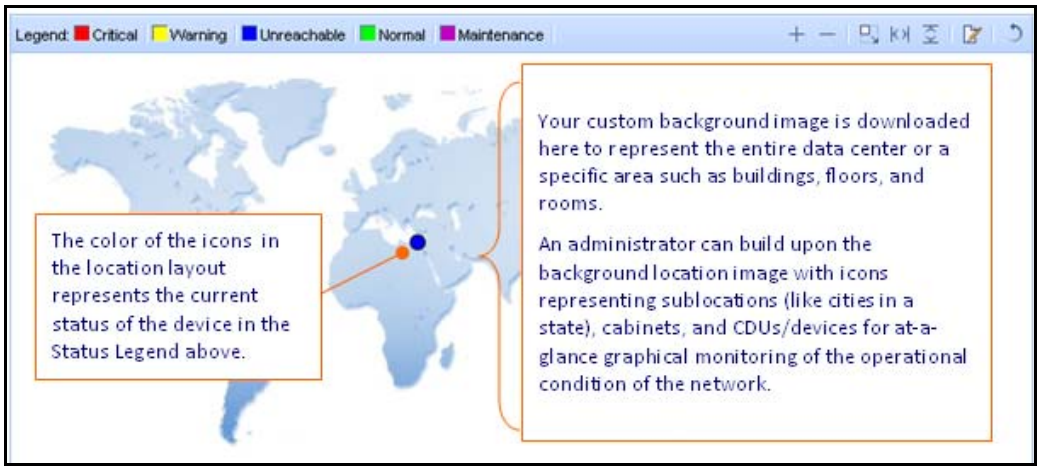
## *Lines*

The Lines application shows detailed data for power lines in circuits. Line data assists in providing instant feedback for the state of the full circuit, allowing high/low thresholds to be set for power and load.

**NOTE:** Lines are components of circuits; therefore, lines cannot be created individually in the Lines application. You must create individual lines in the Circuits application.

### *Locations*

The Locations application gives you the tools necessary for the review and management of networked devices. Locations, in the form of graphic images – such as a state map or a data center floor layout – are the background on the Views page upon which the administrator builds a graphic representation of the data center with icons for sub-locations, cabinets, and CDUs. Location images represent the customized levels of your data center, such as buildings, floors, and rooms.




### *Outlet Clusters*

An outlet cluster is a collection of outlet groups that allow you to define and control large blocks of outlets that span multiple cabinets and multiple IP addresses.

The Outlet Clusters application lets you select various CDU power outlets (as part of an outlet group) and place the outlets into a collection of named "outlet clusters" for convenient and fast administration of outlet control.

#### The outlet control tab (outlet clusters)

Lets you issue outlet On, Off, and Reboot (or None) commands (depending on your assigned user capabilities) on specific outlets or globally on all outlets in a CDU.

The outlet control actions are:

**None:** Clears your selection, no action on the outlet will be taken.

**Off**: Outlet is off.

**On:** Outlet is on.

**Reboot:** Outlet is off and reboot action initiated.

### *Outlet Groups*

An outlet group is a collection of outlets in a CDU (up to two linked enclosures) with a single IP address. An outlet group can be in multiple outlet clusters.

The Outlet Groups application lets you select various CDU power outlets and place them into a collection of named "outlet groups" for convenient and fast administration of outlet control.

#### The outlet control tab (outlet groups)

Lets you issue outlet On, Off, and Reboot (or None) commands (depending on your assigned user capabilities) on specific outlets or globally on all outlets in a CDU.

The outlet control actions are:

**None:** Clears your selection, no action on the outlet will be taken.

**Off**: Outlet is off.

**On:** Outlet is on.

**Reboot:** Outlet is off and reboot action initiated.

## *Outlets*

The Outlets application displays all outlets for the CDUs in SPM and allows outlet power monitoring, outlet command control (on/off/reboot), outlet configuration (name/asset/URL), and configuration of user group permissions for the outlets. The Outlets application has two tabs: Outlet Power and Outlet Control.

### Outlet Power Tab

The Outlet Power tab displays the operational details of outlets in a list for monitoring outlet status and power.

### Outlet Control Tab

The Outlet Control tab provides a list of outlets on discovered CDUs for outlet power monitoring/outlet control, and optionally for asset management.

From the Outlet Control tab you can issue outlet On, Off, and Reboot (or None) commands (depending on your assigned user capabilities) on specific outlets, or issue commands globally on all outlets in a CDU.

## *Sensors*

The Sensors application configures low/high and warning/critical thresholds for temperature, humidity, and dew point. A warning alarm for sensor predictive temperature can also be set. For the Sensors application and its related tabs and pages to display in SPM, a discovered CDU or environmental monitor must be connected to a sensor. The sensor will then automatically display in the Sensors window.

**NOTE:** The Sensors list displays sensors connected to Server Technology CDUs and environmental monitors. If the RF Code wire-free solution is enabled, SPM displays RF Code's sensors in the Other Sensors tab.

## *Zones*

The Zones application gives you an additional way to virtually group CDUs or cabinets (in a named zone) for viewing and trending, regardless of the physical locations of the devices. Only CDUs and cabinets can be grouped into a zone - you cannot group any other system objects into a zone. You can select either CDUs or cabinets to be grouped into a specific zone. CDUs and cabinets cannot be mixed in the same zone.

**NOTE:** You can select either CDUs or cabinets to be grouped into a specific zone – CDUs and cabinets cannot be mixed in the same zone.

## Setup Items

Setup Items is an SPM application designed for quickly viewing and accessing ALL SPM system objects, with or without a pre-established hierarchy.

Setup Items is simply a sequential list of items. Polling is not used with Setup Items, so the benefits are filtered lists for quick configuration, as well as being able to view default configuration data for all system objects.

**NOTE:** The Setup Items list shows the same system objects as the Device Selection list: branches, cabinets, CDUs, circuits, contact closures, enclosures, environmental monitors, infeeds, lines, locations, outlet clusters, outlet groups, outlets, sensors, and zones. For a description of these system objects, please see the previous section, Device Selection.

In addition to the system objects, the Setup Items list also has two unique applications that you won't find in Device Selection: **Device Discovery** and **Scheduled Tasks**, both described in this section as follows.

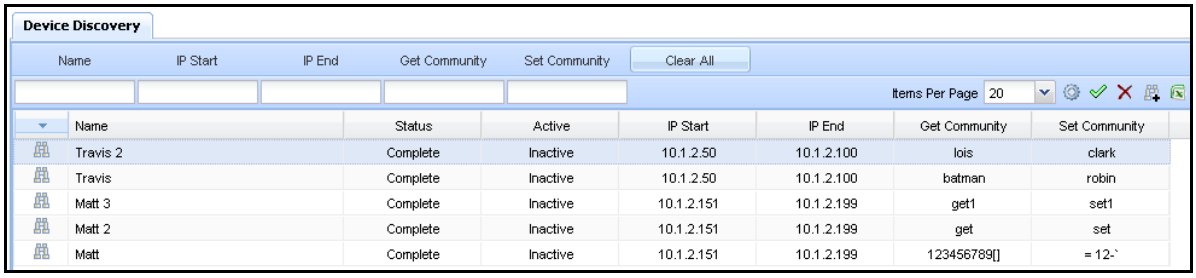
### *Device Discovery*

The Device Discovery application lets you define the parameters for a manual discovery of CDUs in your network. Discovery can be used for the initial network discovery when SPM is installed and then later as needed for new devices added to the network

You can discover a single IP address in your network or you can discover multiple devices in a range of IP addresses (starting IP address through ending IP address).

#### Device Discovery Tab

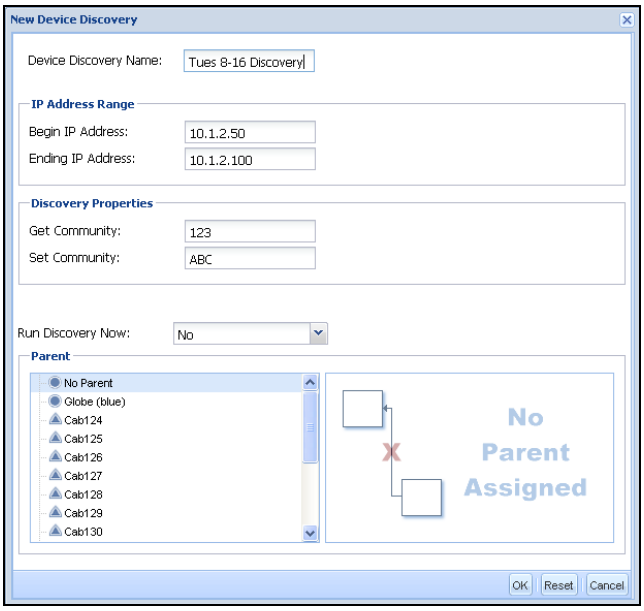
Shows a list of the created device discoveries and their parameters, as shown in the following example:




| Name | Status | Active | IP Start | IP End | Get Community | Set Community |
|---|---|---|---|---|---|---|
| Travis 2 | Complete | Inactive | 10.1.2.50 | 10.1.2.100 | lois | clark |
| Travis | Complete | Inactive | 10.1.2.50 | 10.1.2.100 | batman | robin |
| Matt 3 | Complete | Inactive | 10.1.2.151 | 10.1.2.199 | get1 | set1 |
| Matt 2 | Complete | Inactive | 10.1.2.151 | 10.1.2.199 | get | set |
| Matt | Complete | Inactive | 10.1.2.151 | 10.1.2.199 | 123456789[] | = 12-` |

#### Creating a New Device Discovery

Click the New Device Discovery  icon (or right-click a discovery in the Device Discovery list and select New Device Discovery option). The New Device Discovery window opens to allow setting the parameters for the new discovery.




Create a new name for your discovery, and provide IP addresses, Get/Set community strings, and select a parent system object. Note the Run Discovery Now field where you can run the device discovery immediately (manual discovery) or hold until you decide to run the discovery later.

### Configuring the Device Discovery

Select a created discovery in the Name field of the Device Discover list and click the Configure icon (or right-click the discovery in the list and select the Configure Device Discovery option). The Configure Device Discover window opens to allow editing of the parameters for the selected discovery.

### Running a Manual Device Discovery

To run a device discovery immediately, right-click a created discovery on the Device Discovery list and select the Run Discovery Now option. The discovery runs immediately using the configured parameters, and a successful confirmation message displays in the lower right corner of the window.

You can also click the Run Discovery Now icon on the toolbar or select Yes from the Run Discovery Now field on the Device Discovery parameter windows (shown above).

### Running an Automatic Device Discovery

You can schedule an automatic device discovery using the Schedule Tasks feature. See "Scheduling an Automatic Device Discovery" in the Schedule Tasks section.

### About Competitor Devices

Competitor Devices cannot be discovered with the Device Discovery feature. You can add competitor devices individually to SPM using the New Device icon in the CDU application.

### Run Discovery Now

To run a device discovery immediately, right-click a created discovery on the Device Discovery list and select the Run Discovery Now option. The discovery runs immediately using the configured parameters, and a successful confirmation message displays in the lower right corner of the window.

You can also click the Run Discovery Now icon on the toolbar or select Yes from the Run Discovery Now drop-down list on the Device Discovery parameter windows (shown above). To hold the running of the discovery for another time, select No from the drop-down list.

## *Schedule Tasks*

The Schedule Tasks application allows you to define and schedule the frequency of SPM system events to be run automatically on a future date or on a recurring basis.

For example, you can set up the SPM configuration action of issuing the Off, On, or Reboot command to an outlet (or a group of outlets) to automatically run at the same time each week on the specified outlet(s).

### Scheduled Tasks Tab

The Scheduled Tasks tab shows a list of created system events that have been configured to be run as scheduled tasks. Some of the events you can create as scheduled tasks include (but are not limited to) system backup, DB maintenance, outlet control commands (Off, On, Reboot), and device discovery.

### Task Overview Tab

The Task Overview tab provides a monthly calendar (and a scroll to previous/future months) for at-a-glance setup and review of scheduled events.

### Cloning a Task Schedule

You can use the Clone function to save time by cloning a similar configured task already displayed in the Scheduled Tasks list. The Clone function creates an exact copy of the original task and schedule.

# Chapter 5: Viewing Reported Data

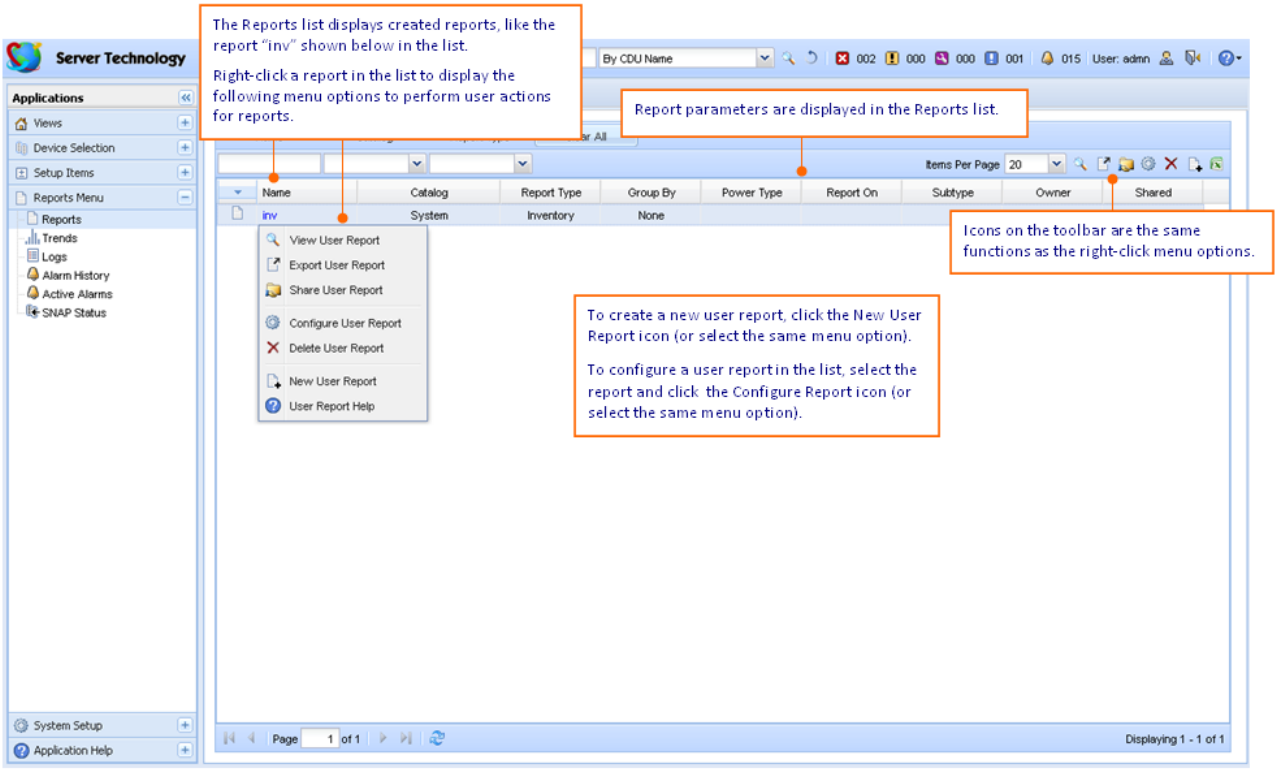
This chapter is an overview of the user reports, graphical trend reports, system activity logs, and active alarm/alarm history information available in SPM.

## Reports

The Reports application generates user reports based on information collected from available CDU readings. User reports show power trending information (automatically reloaded) for networked CDUs over a specified time frame. You can choose from several trend reports and the report will be customized by the parameters you select.

### *Reports List*

Go to **Reports Menu** > **Reports** to displays a list of created reports by report name.

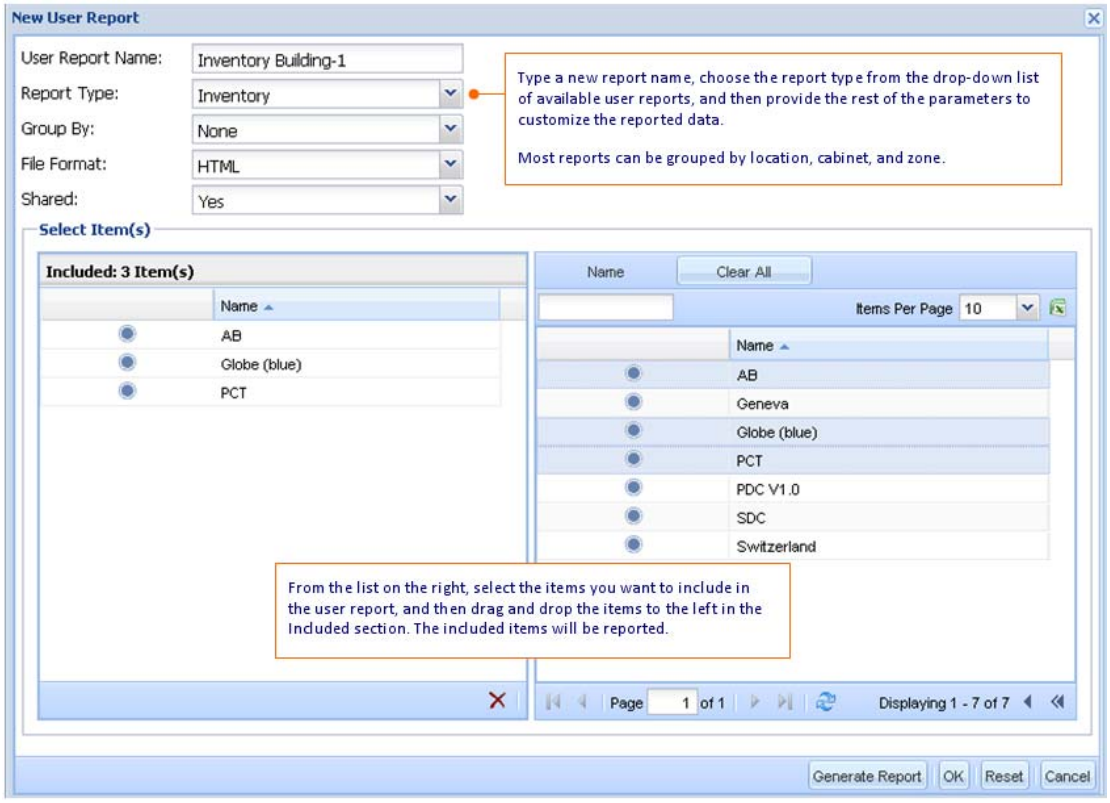



**TIPS:**

- You have the option to make one or more user reports public to be shared with other logged-in SPM users.
- Data for a zone is included in user reports; you can group any of the reports within a predefined zone.
- If you are using both HTTP (SSL) and Internet Explorer 7 or 8, you will not be able to export user reports.

## *Creating a New Report*

The New User Report window allows you to set the desired parameters for creating a new report. The parameters that display will depend on the report type you select to generate.




## *Configuring a User Report*

The Configure User Report window allows you to modify the parameters for an existing report. You select a report in the Reports list and choose the Configure User Report function (menu option or icon), edit the parameters, and regenerate the report.

## *Report Types*

The following reports are available to create (or modify) with user-specified parameters:

**SPM User Reports**

| Report Category | Report Type(s) |
|---|---|
| System | Inventory, Total Power (W), Power Density |
| General | Input Current, Input Voltage, Input Power, PIPS Summary |
| Cabinet | U Space, Cabinet Redundancy, Cabinet Device Inventory |
| Sensors | Environmental |
| SNAP | SNAP Information |
| General with Subtotals | Subtotal Input Current, Subtotal Input Power |
| Power Summary | Complete Outlet Power, Complete Infeed Power, Complete Power Summary |
| Circuit Reports | Circuit Summary, Detailed Circuit Summary |
| Facility Reports | PUE |
| Group/Cluster Power | Outlet Cluster Power, Outlet Group Power, Outlet Cluster Power Detailed, Cabinet Device Power |
| Energy Consumed | By Day, By Month, By Year |
| Energy Utilization | No Usage, Low Usage, High Usage |

## *User Report – Examples*

### Example 1: Energy Consumed

The following example of an SPM user report shows the "Energy Consumed By Day" report, generated for the outlet power type, and reported by outlet group for a specified start and end date.

**Report: BaselinePT_DailyOutlets**

**Energy Consumed For Outlet Groups On Outlet Readings By Day**
Run by admn at Wed, 07 Aug 13 18:29:56 -0400 for the time period of 2013-03-04 to 2013-03-15

| Time | Outlet Group | Energy (kWh) |
|---|---|---|
| 2013 - 03 - 04 | | |
| | 534BaselinePT_Outlets | 25.700 |
| | 552BaselinePT_Outlets | 0.749 |
| | 557BaselinePT_Outlets | 29.506 |
| 2013 - 03 - 05 | | |
| | 534BaselinePT_Outlets | 17.995 |
| | 552BaselinePT_Outlets | 0.533 |
| | 557BaselinePT_Outlets | 20.707 |
| 2013 - 03 - 06 | | |
| | 534BaselinePT_Outlets | 17.974 |
| | 552BaselinePT_Outlets | 0.508 |
| | 557BaselinePT_Outlets | 20.703 |
| 2013 - 03 - 07 | | |
| | 534BaselinePT_Outlets | 17.975 |
| | 552BaselinePT_Outlets | 0.534 |
| | 557BaselinePT_Outlets | 20.725 |
| 2013 - 03 - 08 | | |
| | 534BaselinePT_Outlets | 17.975 |
| | 552BaselinePT_Outlets | 0.535 |
| | 557BaselinePT_Outlets | 20.698 |

### Example 2: Total Power

The following example of an SPM user report shows the CDU's total power usage grouped by cabinet name.

**Report: power**

**Total Power**
Run by admn at Wed, 14 Aug 13 16:45:11 -0400

| Cabinet | CDU | Total Power (W) |
|---|---|---|
| 529 | | |
| | 192.168.1.201 | 0 |
| 531 | | |
| | 192.168.1.207 | 0 |
| | 192.168.1.208 | 0 |
| 534 | | |
| | 534HorizontalPower | 0 |
| | 534VerticalPower | 0 |
| 535 | | |
| | 192.168.1.203 | 0 |
| | 192.168.1.204 | 0 |
| 552 | | |
| | 192.168.1.202 | 0 |

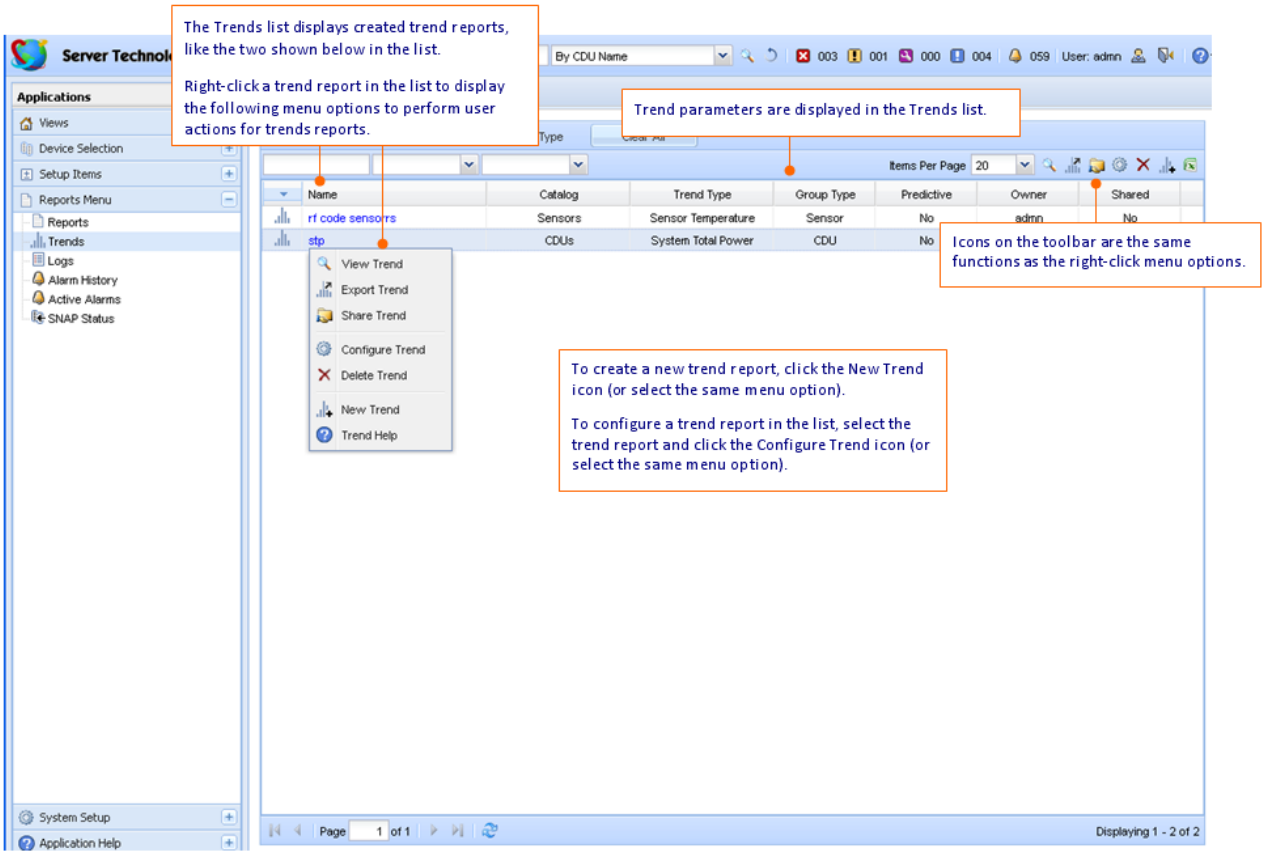
## Trend Reports

The Trends application generates graphical reports based on a significant amount of ongoing data collected from available CDU readings. Trend reports show power trending information (automatically reloaded) for networked CDUs over a specified time frame and can be a useful tool for troubleshooting the network and forecasting device operations.

### *Trends List*

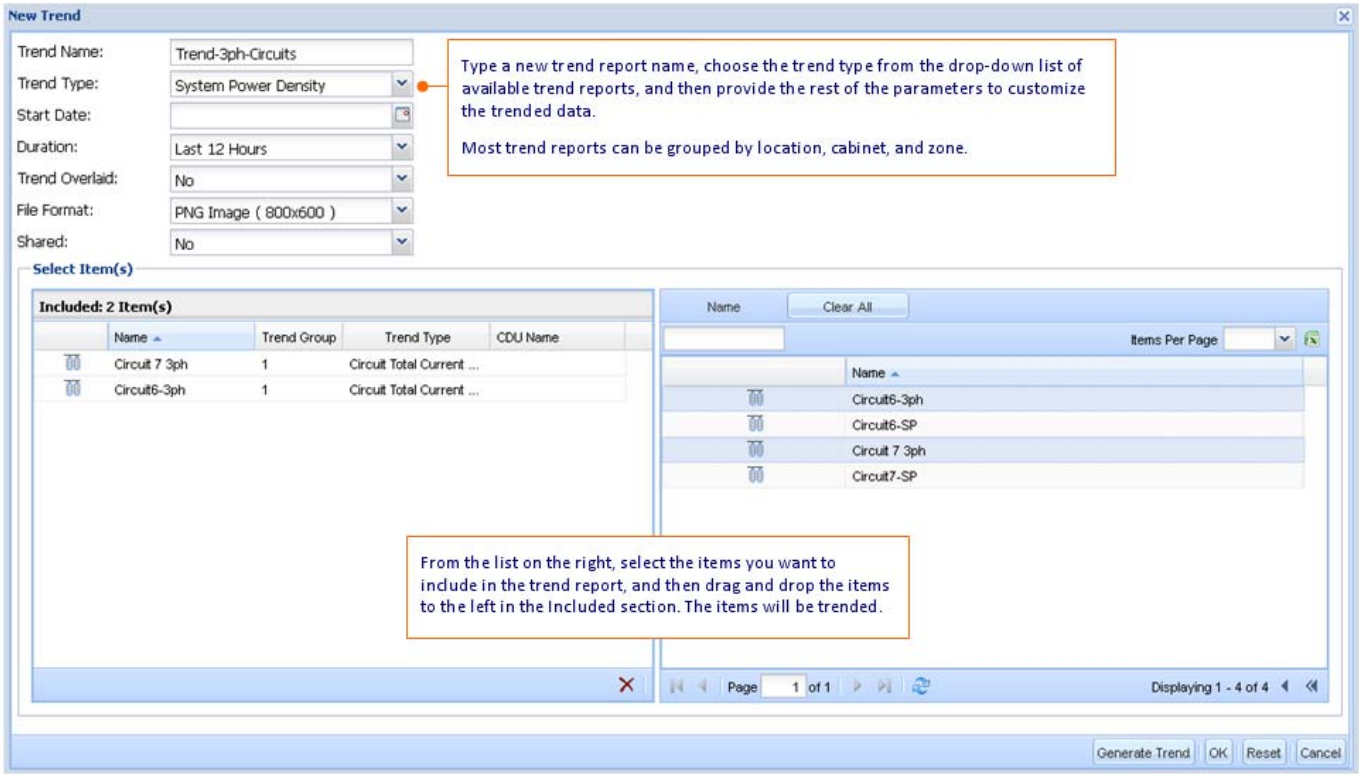
The Trends application displays detailed operational data collected from CDU readings in a graphical report. You can customize a trend report by selecting from several types of trend reports and their related parameters. The parameters that display will depend on the trend report type you select to generate.

Go to **Reports Menu > Trends** to display a list of created trend reports by name.



### *Creating a New Trend Report*

Several types of trend reports are available in the New Trend Report window, allowing you to set the parameters required for each report type.




### *Trend Report Types*

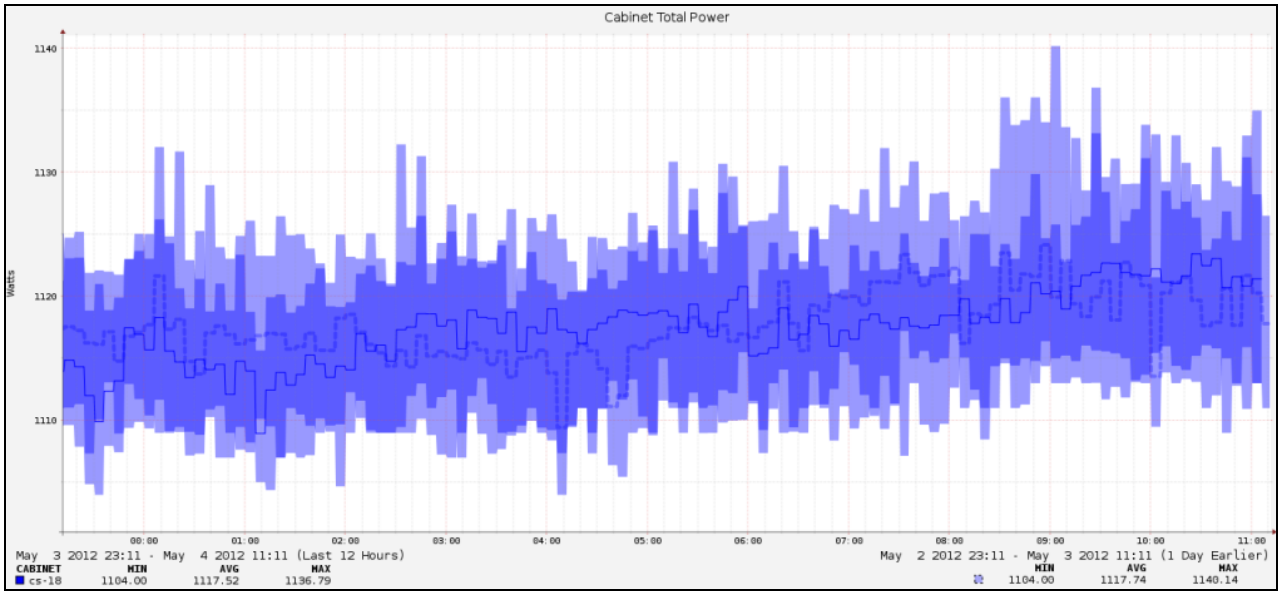
The following graphical trend reports are available to create (or modify) with user-specified parameters:

**SPM Trend Reports**

| Trend Report Category | Trend Report Type(s) |
|---|---|
| Cabinets | Cabinet Total Power (W) |
| CDUs | System Power Density, System Total Power |
| Circuits | Circuit Total Current (A), Circuit Total Power (W) |
| Infeeds | Infeed Line Current, Infeed Line Active Power, Infeed Line Voltage, Infeed Line Apparent Power, Infeed Line Crest Factor, Infeed Line Power Factor, Infeed Line Capacity Used, Infeed Phase Current, Infeed Phase Voltage |
| Lines | Line Total Current (A), Line Total Power (W) |
| Locations | Location Total Power (W) |
| Outlets | Outlet Current, Outlet Active Power, Outlet Voltage, Outlet Apparent Power, Outlet Crest Factor, Outlet Power Factor |
| Outlet Groups | Outlet Group Total Current (A), Outlet Group Total Power (W) |
| Outlet Clusters | Outlet Cluster Total Current (A), Outlet Cluster Total Power (W) |
| PIPS | PIPS Capacity Used, PIPS, Active Power, PIPS Apparent Power, PIPS Power Factor |
| Sensors | Sensor Temperature, Sensor Humidity |
| Zones | Zones Total Power (W) |
| Cabinet Devices | Cabinet Device Total Current (A), Cabinet Device Total Power (W) |

### *Trending with Overlaid Time Period/Offset*

Selecting the Overlaid Time Period option allows trended system objects to be overlaid and placed on multiple scales for comparison at different times. You can also select the Overlaid Time Offset in hours, days, weeks, months, or years.




The trend report above shows the performance of the cabinet in the last 12 hours (left legend) compared to the same timeframe one day earlier (right legend).

### *Trending with Predictive Analysis*

The Predictive Analysis option is a trend reporting forecast that uses patterns and conditions found in historical trend reports to predict future risks or opportunities about device performance.

**NOTE:** You can only select one item from the devices list to be included in one predictive analysis trend report.

Predictive Analysis does not use duration; instead the timeframe shown on the report is automatically determined by the power/temperature predictive analysis settings you configured at System Setup > Predictive Analysis.

The power/temperature predictive analysis settings define:

- when to start the trend and how many of the last days/hours to analyze.
- when to end the trend and how to determine what is the “near future” when data is likely to cross a threshold.

The power and temperature predictive analysis settings can be configured separately – one for power, the other for temperature. A second set of predictive analysis settings can also be defined for each type, shown in the trend report as a second progression line and an additional summary row in the legend.

#### Predictive Analysis Terminology:

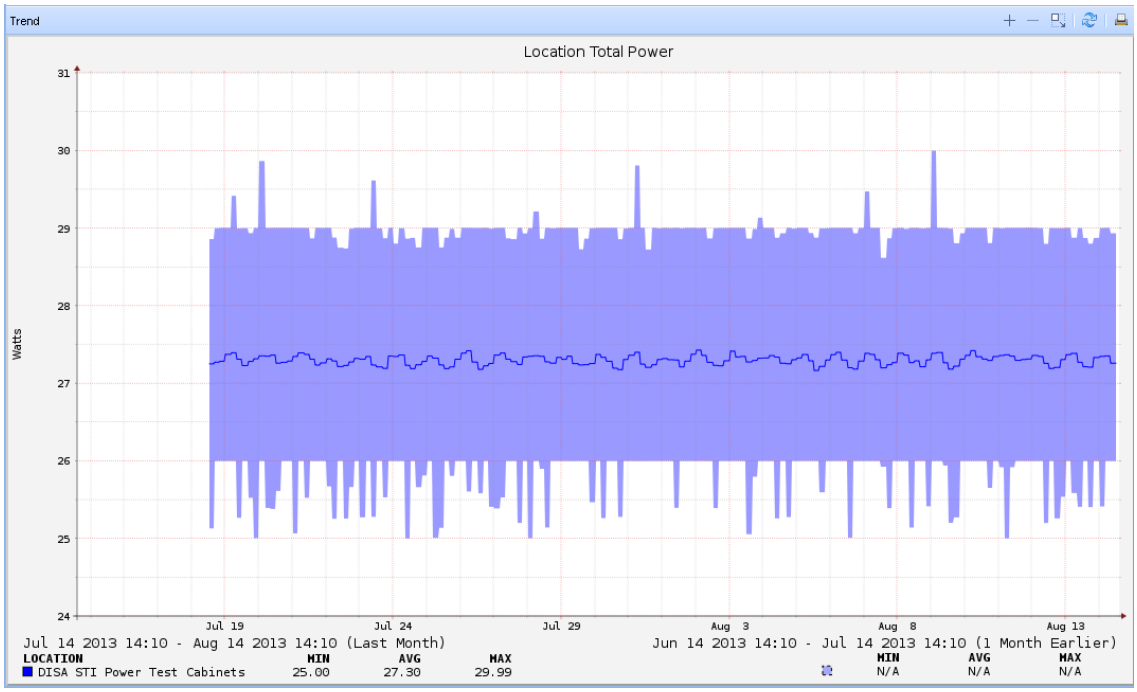
**Rate of Ascension:** The linear rate at which the data progresses on the trend report, or by how much the wattage/temperature is rising per day on average. This rate is calculated based on the “history” setting defined in the Predictive Analysis settings page. Note that if the values continue to rise at this rate, they are likely to reach the threshold around the forecasted timeframe.

**Predicted High Crossing:** A date that estimates when the trended data will reach the high warning/critical threshold defined for the system object in the trend – if the values continue to grow at approximately the same rate. The date will only be displayed if within the “future” value defined in the Predictive Analysis settings page at System Setup > Predictive Analysis, for example, the values in the “Future for 1st Predictive” and “Future for 2nd Predictive” fields.

## *Trend Report – Examples*

### Example 1: Location Total Power

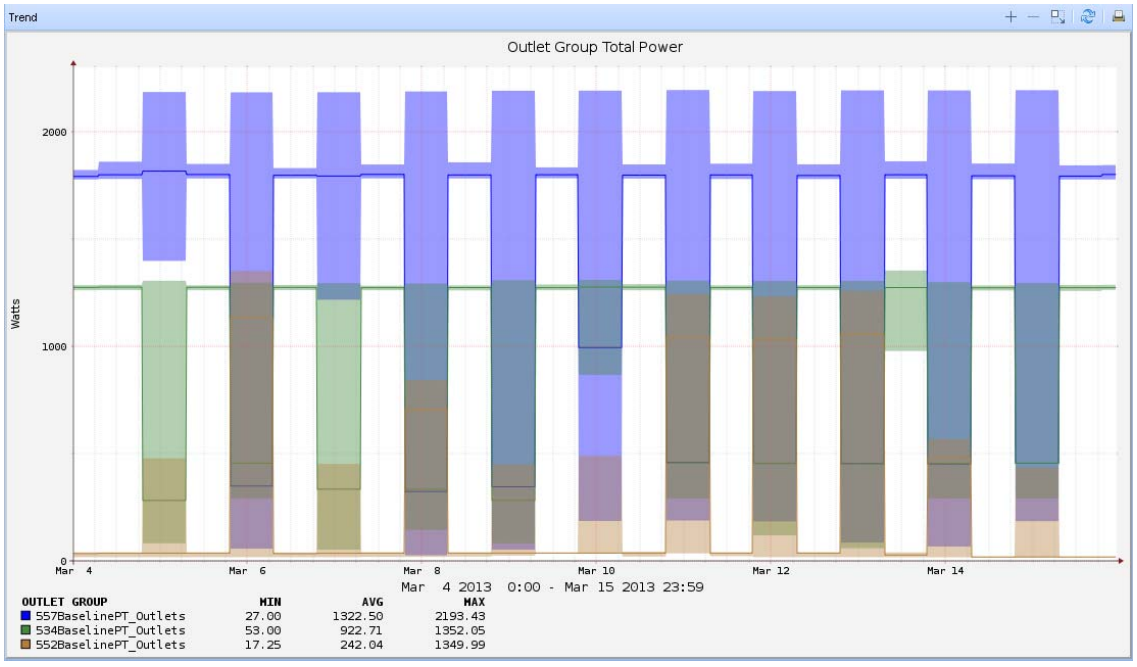
The following example of an SPM trend report shows total power for a specific location.




The headings Min, Avg, and Max are a quick reference for the minimum, average, and maximum values reported. The date and time interval is based on the specified date range or duration specified for the report.

### Example 2: Outlet Group Total Power

The following example of an SPM trend report shows a comparison of total power user by outlet group names.



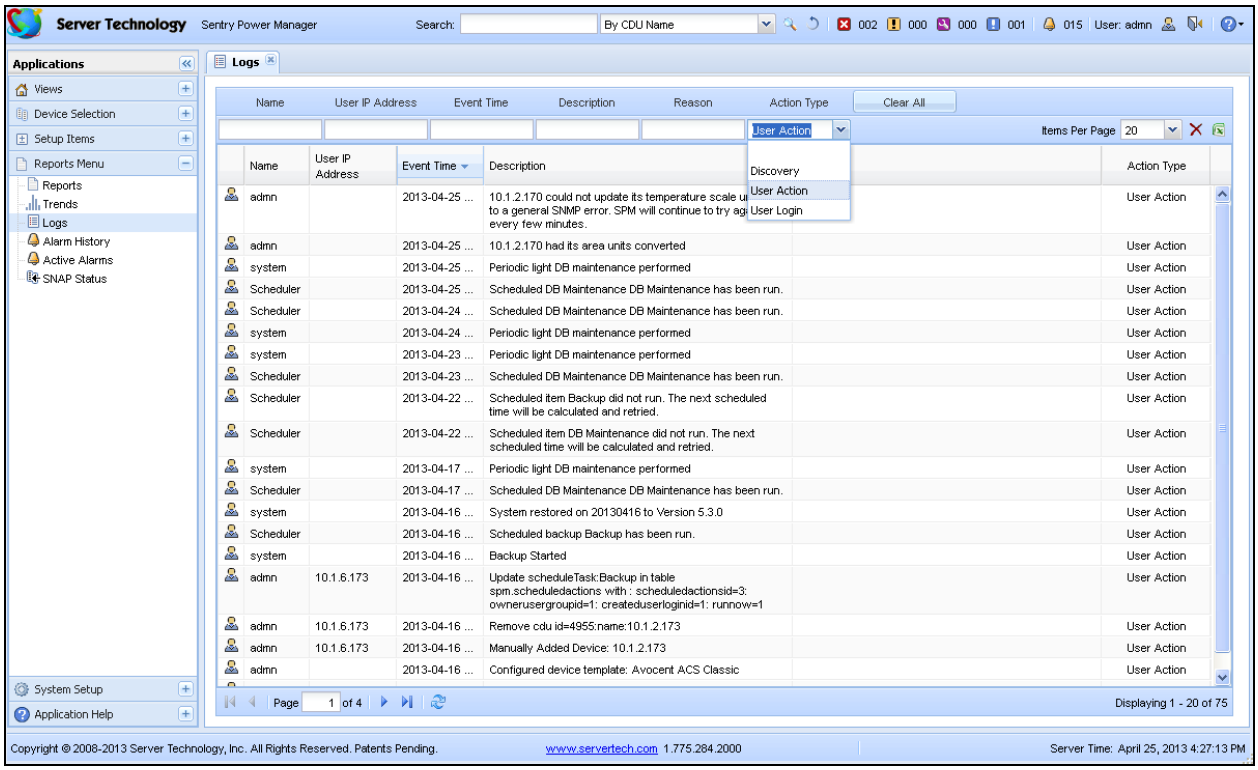

Note that each device in the report (in this example, outlet groups) is represented by a different color code shown in the square colored icon in the legend at the bottom of the report.

## Logs

The Logs application provides dynamic system events logs for device discovery, user action, and user login.

### The Logs Tab

**SPM > Reports Menu > Logs** displays the last log viewed and allows access to the Action Type drop-down list to select the Discovery, User Action, or User Login log to be displayed.




### Discovery Log

The Discovery Log lists system event details that occur during the SPM discovery of CDUs (and other devices) in the network.

### User Action Log

The User Action Log shows user-initiated activities, such as a location enabled, the setting of a parent location, the converting of temperature units, and many more system actions performed when users are logged in to SPM.

### User Login

The User Login Log reports the login/logout time for each SPM user and the IP address of the related device.

## Alarm Management

Every alarm condition that occurs in your SPM system is critical to understanding the operational status of the network and the discovered devices in the network. SPM provides a dynamic Alarm Management application with data about immediate **active alarms** and an **alarm history log**.

### *Rolled-Up Alarms*

SPM reports status and alarm conditions for devices, but also for system objects. This means you can see a Warning in the Device Status Bar for an object (such as a cabinet), if that cabinet contains a CDU (or other device) with a power level that exceeds configured high/low thresholds. This is the "rolled up" method SPM uses for status/alarm reporting: the status and alarm conditions reported by a device are "rolled up" into the non-device object, like the cabinet that contains the devices in alarm, or the location that contains the cabinet with the devices in alarm. Remember that the "roll up" reporting only considers device alarms.

#### Example of a rolled-up alarm:

A Location named Floor-1 contains a cabinet named Cab-123, which contains two CDUs named CDU-1 and CDU-2.

If the total power of CDU-1 and CDU-2 exceeds configured high/low thresholds for current and/or power levels, an alarm triggers on Cab-123 but CDU-1 and CDU-2 report Normal status. The location status for Floor-1 also reports Normal status.

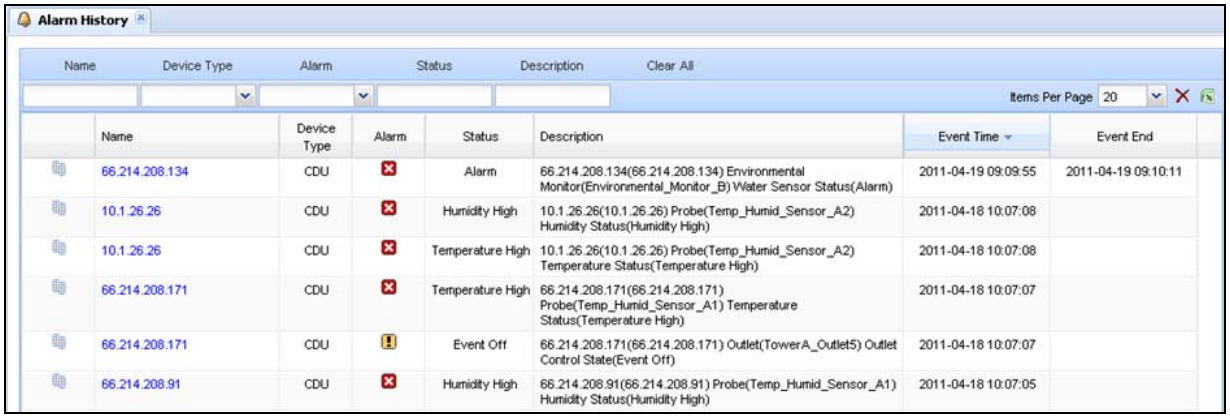
However, if CDU-1 or CDU-2 reports a Critical alarm due to exceeded thresholds, then Cab-123 and Floor-1 report as Critical.

### *Alarm History*

The Alarm History function records each alarm event in a historical log that includes the device name and device type, alarm type, device status, description of the event, event time, and event end.

#### Alarm history tab

SPM maintains a history of alarm events in a list so you can track trends and locate problem areas in the network.




| Name | Device Type | Alarm | Status | Description | Event Time | Event End |
|---|---|---|---|---|---|---|
| 66.214.208.134 | CDU | | Alarm | 66.214.208.134(66.214.208.134) Environmental Monitor(Environmental_Monitor_B) Water Sensor Status(Alarm) | 2011-04-19 09:09:55 | 2011-04-19 09:10:11 |
| 10.1.26.26 | CDU | | Humidity High | 10.1.26.26(10.1.26.26) Probe(Temp_Humid_Sensor_A2) Humidity Status(Humidity High) | 2011-04-18 10:07:08 | |
| 10.1.26.26 | CDU | | Temperature High | 10.1.26.26(10.1.26.26) Probe(Temp_Humid_Sensor_A2) Temperature Status(Temperature High) | 2011-04-18 10:07:08 | |
| 66.214.208.171 | CDU | | Temperature High | 66.214.208.171(66.214.208.171) Probe(Temp_Humid_Sensor_A1) Temperature Status(Temperature High) | 2011-04-18 10:07:07 | |
| 66.214.208.171 | CDU | | Event Off | 66.214.208.171(66.214.208.171) Outlet(TowerA_Outlet5) Outlet Control State(Event Off) | 2011-04-18 10:07:07 | |
| 66.214.208.91 | CDU | | Humidity High | 66.214.208.91(66.214.208.91) Probe(Temp_Humid_Sensor_A1) Humidity Status(Humidity High) | 2011-04-18 10:07:05 | |

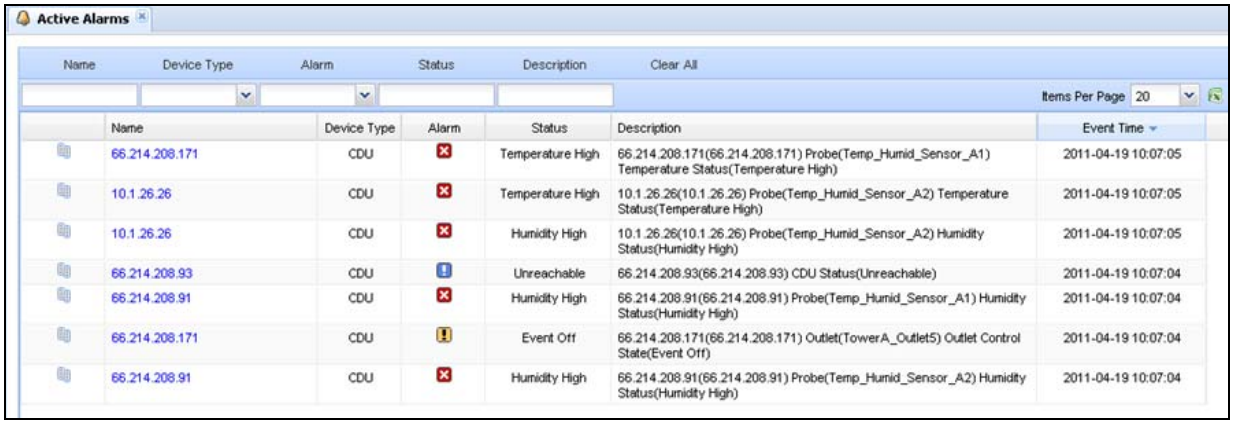
Alarm history information shows an operational pattern that can assist you with revising equipment maintenance schedules and preventing future device and network issues.

## *Active Alarms*

Active Alarms is a dynamic alarm list that shows a mixed set of CDU, device, and system object alarms in immediate critical, warning, or unreachable status.

### Active Alarms Tab

SPM maintains a list of active alarm events so you can quickly respond to problem areas in the network.



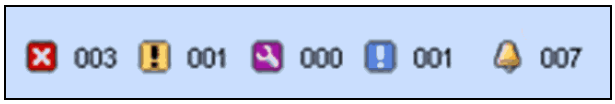

| Name | Device Type | Alarm | Status | Description | Event Time |
|---|---|---|---|---|---|
| 66.214.208.171 | CDU | | Temperature High | 66.214.208.171(66.214.208.171) Probe(Temp_Humid_Sensor_A1) Temperature Status(Temperature High) | 2011-04-19 10:07:05 |
| 10.1.26.26 | CDU | | Temperature High | 10.1.26.26(10.1.26.26) Probe(Temp_Humid_Sensor_A2) Temperature Status(Temperature High) | 2011-04-19 10:07:05 |
| 10.1.26.26 | CDU | | Humidity High | 10.1.26.26(10.1.26.26) Probe(Temp_Humid_Sensor_A2) Humidity Status(Humidity High) | 2011-04-19 10:07:05 |
| 66.214.208.93 | CDU | | Unreachable | 66.214.208.93(66.214.208.93) CDU Status(Unreachable) | 2011-04-19 10:07:04 |
| 66.214.208.91 | CDU | | Humidity High | 66.214.208.91(66.214.208.91) Probe(Temp_Humid_Sensor_A1) Humidity Status(Humidity High) | 2011-04-19 10:07:04 |
| 66.214.208.171 | CDU | | Event Off | 66.214.208.171(66.214.208.171) Outlet(TowerA_Outlet5) Outlet Control State(Event Off) | 2011-04-19 10:07:04 |
| 66.214.208.91 | CDU | | Humidity High | 66.214.208.91(66.214.208.91) Probe(Temp_Humid_Sensor_A2) Humidity Status(Humidity High) | 2011-04-19 10:07:04 |

This above example shows CDU as the only device type listed. However, Active Alarms can also report “rolled up” alarms for the following SPM system objects:

- CDU
- Cabinets
- Locations
- Outlet Groups
- Outlet Clusters
- Circuits

## *Active Alarms on the Device Status Bar*

The Device Status Bar shows the Active Alarm  icon and the dynamic count of active alarms – 007 shown in the following example. The count of active alarms must be at least 001 to display an Active Alarms log.



# Chapter 6: Configuring SPM

This chapter covers the major SPM configuration areas of System Setup, Custom Device Templates, RF Code Zone Managers (with Zone Manager Readers), and Firmware/Backup/Upload/Upgrade functions.

SPM configuration can be performed by an Administrator or Power User account. (Power User cannot set up users).

## System Setup

The System Setup application covers Configuration (system settings, SNMP settings, Syslog settings, and Server settings); Predictive Analysis settings; Network settings; Email Notification settings; Mount Point locations; and a SNAP default template.

### *Configuration Tab*

Provides system setup parameters for the SPM settings, SNMP, Server, Syslog, and Log areas.

#### Settings

Sets up SPM as an appliance, eliminating the need to configure system and network settings through the operating system. Standard default port numbers are provided or you can designate port numbers within your network firewall.

**NOTE:** The FTP option is required to send updates, retrieve backups, and post firmware binary files.

#### SNMP Settings

Stores the data necessary to configure SPM for 2-way communication with applications and hardware devices. Recommended fields values are displayed in the SNMP section.

**WARNING:** The SNMP section is advanced configuration only – the SNMP settings control the behavior of how SPM uses SNMP to communicate with system objects. SNMP traffic is made up of UDP packets, so heavy network loads may lead to lost packets. The SNMP settings are intended to tune SPM to specific sites.

#### Server Settings

Provides values to optimize the most commonly used Server resources. Default settings are provided.

**WARNING:** The Server section is advanced configuration only – settings define internal server processing and behavior. Most of the delays in these settings are in place to make SPM less aggressive on small systems. Server Technology's devices generally do not have response issues, but some other devices may fail to respond if too many reads are performed too quickly. Not recommended to change the values of Server settings unless approved by Server Technology Technical Support.

#### Log Settings

This section controls the settings for action reasons, and determines the time frame when system logs and alarm history will be deleted.

#### Syslog Settings

Enables parameters for a Syslog server configuration for remote or local activity log collection. Once configured, the Syslog server is the central location for viewing SPM system activity information.

### *Predictive Analysis Tab*

Allows you to focus on device growth (for power and temperature only) and to customize the growth rate "history" and "future" ("1st predictive" for a single set of growth data) and/or for two sets of growth data ("1st predictive" and "2nd predictive").

Both the specified history (how far back) and the specified future (how far forward) are used in calculating growth rates for device operations, and then predicting when the power and temperature thresholds for those devices could be crossed.

#### Power Predictive Analysis Settings

Settings for enabling device growth rate, history, and future for power predictive analysis only.

#### Temperature Predictive Analysis Settings

Settings for enabling device growth rate, history, and future for temperature predictive analysis only.

### *Network Tab*

Provides parameters for establishing a primary/default network (Network 1) and an additional network port (Network 2) for SPM remote access.

#### Network 1 (Default)

Settings cover the primary port for the SPM web interface and for communication with network devices. You determine automatic port configuration using Dynamic Host Configuration Protocol (DHCP) as the network mode (or Static/Disabled), and the primary/secondary DNS names for a domain name association for IP addresses.

#### Network 2 (Optional)

Settings for an optional secondary network port.

### *Email Notification Tab*

The Email Notification tab alerts email and text communication recipients with selected SPM system activity logs.

#### Email Server

Configures the SMTP host name/port number and the sending email address.

#### Recipients

Provides up to four separate recipient email addresses.

#### Notification Categories

Allows selection of the logs to be emailed to the recipients: Discovery, Alarm Status, User Login, and User Actions. All recipients will receive the same specified logs at the same time.

#### Tip: About Message Relay

When an SPM user emails an SPM report or trend report (either by directly emailing the report as an attachment, or by emailing the report through the SPM Schedule Task function), your Email Server may view these incoming emails from the SPM Host as "message relay", and the email could be blocked.

If this happens in your environment, a recommendation is to make the SMTP Host field unique for SPM in the Email Notification tab.

Then have your Email Server Administrator place an exemption on the SMTP Host. The exemption is not a security issue because SPM emails from the SMTP Host Name already initiate from within your firewall.

#### Tip: About SMS Text Messaging

To use SMS text communication and receive notification on mobile phones, convert the 10-digit recipient mobile number to an email address. The format of the email address and the text message rates that apply depend on the mobile provider.

**Example:** If the mobile provider is ATT, convert the following mobile number to an email address as shown:

This ATT mobile phone number 775-555-1234

converted to an email address is 7755551234@txt.att.net

Type the email address into one of the "Mail To" recipient fields in the Email Notification tab.

### *Mount Point Tab*

Allows naming and storing of backup files in your desired location away from the SPM drive. You provide location and login username/password.

### *SNAP Default Tab*

Displays a default SNAP template for applying parameters to newly created cabinets, locations, and zones aside from the SNAP template values associated with a CDU.

## Custom Device Templates

Custom Device Templates is a key-activated feature for data collection that allows communication, tracking, and reporting for any SNMP-enabled device you create to export data from within SPM.

The feature tracks a subset of the operational values for devices that are not otherwise in communication with SPM; for example, an unsupported PDU, UPS, or printer.

For more information, see: Chapter 10: Data Tracking with Custom Device Templates

## Zone Managers

**NOTE:** The Zone Managers option displays only with an activated software license key purchased from Server Technology.

The Zone Manager is the RF Code software product that collects and organizes power and environmental readings received from deployed readers, as part of the optional and key-activated RF Code wire-free monitoring solution. The Zone Manager provides 1-way reporting through its open API directly to SPM.

Once a new Zone Manager is added to SPM, the Zone Manager is treated as a system object that can be configured like other system objects such as CDUs, cabinets, and locations.

### *Zone Manager Readers*

The active RFID Zone Manager Readers use the RF Code open API to receive and collect sensor readings from all deployed and active RF Code sensor tags throughout the data center. The readers then transmit collected data to the Zone Manager software product.

The Zone Manager stores and configures all readers for connection with the optional and key-activated RF Code wire-free monitoring solution. SPM does not treat readers as configurable system objects; the only user action you can perform on a reader is to view its supported data or delete the reader.

## Manage Users

The Manage Users feature allows the administrator account to configure the parameters of SPM users, user groups, and LDAP settings. SPM allows individual user logins to manage their account parameters and preferences, and to change their password.

### *User Group Capabilities*

Capabilities are the predefined levels of user group access to SPM system objects as granted by the SPM administrator (or power user) to individual user groups. SPM recognizes the following user group capabilities:

#### User Group Capabilities

| Level | Capability |
|---|---|
| Administrator | The Administrative user group has full access for all configuration, control (On, Off, Reboot), status, and serial/pass-thru ports. |
| Power | The Power user group has the same capabilities as Administrator but with no user setup capabilities. |
| Regular | The Regular user group has partial access for outlet action control (On, Off, Reboot), outlet status, and pass-thru of assigned outlets, outlet groups, outlet clusters, and serial/pass-thru ports. The Administrator has options for the Regular user's default access: No Access, Off, On, Outlet Control, Reboot, Setup, and View Only. |

**NOTES:**

- The SPM default administrative user is the **admn** user account. (There is no “i” in the **admn** name/password.) The **admn** user can grant full administrative access level rights to other Administrator user groups. The **admn** user account cannot be deleted or demoted.
- For security it is recommended that you first use the default **admn** user account to grant capabilities to another administrative user group, and then associate a new user with the new administrative user group.
- Use the new administrative user account to change the password **admn** for the default **admn** user account.

## *Default Permissions*

Default permissions are the predefined levels of access rights a user (who is in a Regular user group only) has to specific system objects as granted by the SPM administrator (or power user).

**NOTE:** Default Permissions apply only to users in Regular user groups.

SPM recognizes the following default permissions:

### Default Permissions

| Permission | Capability |
|---|---|
| No Access | User has no access to any of the SPM system objects. |
| Off | User has partial access for control (Off), status and pass-thru of assigned outlets. Off is available only to SPM system objects that contain outlets. |
| On | User has partial access for control (On), status and pass-thru of assigned outlets. On is available only to SPM system objects that contain outlets. |
| Outlet Control | User has full outlet control access. Outlet Control is available only to SPM system objects that contain outlets. |
| Reboot | User has partial access for control (Reboot) status and pass-thru of assigned outlets, groups, and serial/pass-thru ports. Reboot is available only to SPM system objects that contain outlets. |
| Setup | User has full Administrator access to the CDU. |
| View Only | User has data view access only. User cannot save changes or perform actions on SPM system objects. |

### Notes About User Group Permissions

The SPM Administrator can now work with user group permissions as follows:

- Mixed permissions are allowed.
- Settings can be defaulted to On.
- Permissions can be set on CDUs, Outlets, Locations, Cabinets, Zones, Circuits, Outlet Groups, and Outlet Clusters.
- Permissions can be set using the right-click menu.
- Permission hierarchy is not supported; for example, changing the top-level location will not change permissions in the lower locations of the hierarchy.
- Permissions can be set using the multi-select function in the object lists.

## *Users Tab*

Establishes a new SPM user and associates the user with a user group. Current SPM users are shown by name, associated user groups, and the capabilities assigned to the users.

## *User Groups Tab*

Establishes a new SPM user group and associates individual users with the group. Displays current SPM user groups by name and the capabilities assigned to each user group.

### Configure user group permissions

The User Groups Tab allows the SPM Administrator to configure user group permissions by granting or denying access to specific SPM system resources, down to the device level.

To grant or deny access to SPM resources for a user group, the user group must be a Regular or Power user group (not the Administrator user group).

You then select an SPM system area (such as Location, CDU, Sensor, Zone, etc.), and then select a specific item in the system area (such as a named data center room in a Location, or you can globally assign permissions to all items listed), to filter the exact resources for granting or denying permissions to the specified user group.

### *LDAP Settings Tab*

Allows the enabling of LDAP and provides the configuration necessary for authentication with LDAP servers to establish connection with SPM. Recommended fields values are displayed in the LDAP settings window.

### *TACACS+ Settings Tab*

Allows the enabling of TACACS+ and provides the configuration necessary for authentication with TACACS+ servers to establish connection with SPM. The SPM Administrator provides the primary/secondary host, port, and encryption key.

### *Active User Login*

The Active User Login tab is a list (by user name) that quickly shows the SPM Administrator which active SPM users are currently logged in. The list provides login time, user group name, user group capabilities, and the default permission for each user in the list.

## Firmware Files

The Firmware Files option allows the CDU to be configured through SNAP (directly within the SPM interface) to use the FTP server for accessing binary upgrade files for firmware upgrade.

Firmware binary files can be stored in the Firmware Files list and accessed when needed to begin the firmware upgrade process for SNAP-configured CDUs. .

**NOTE:** To upgrade Sentry firmware using binary files stored in the Firmware Files list, you must first configure CDUs through SNAP.

## Backup Files

The Backup Files option is a list of backup files that gets populated from each immediate (or scheduled) backup of SPM. When a backup file displays in the Backup Files list, you can download the file to a local or network drive.

If needed, SPM can be restored from the saved backup file

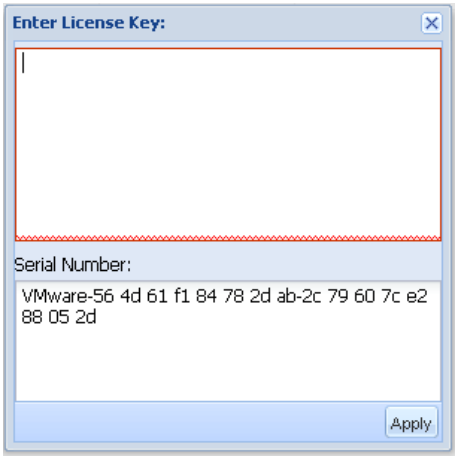
## Upload – Backup/Upgrade File

This option lets you locate and select the backup file to restore the SPM system.

**WARNING:** Use the Upload – Backup/Upgrade File process with caution. When you click the Save button, y**our entire SPM system will be replaced** with the backup/upgrade file you selected. This means all work you have built into SPM, as well as all trending data, will be lost from the time this process starts.

## Add License

The Add License function allows the SPM administrator to enter the software license key received from Server Technology for SPM. The licensing allows the addition of CDUs to the network.



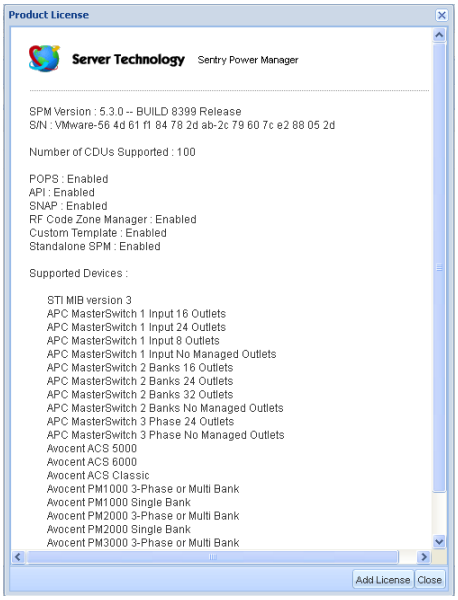

***For the SPM Administrator:***

Go to **System Setup > Add License**

Type the SPM software license key received from Server Technology, based on the SPM serial number displayed and click **Apply**.

This function allows the Administrator to add additional CDUs to the data center network for discovery and communication with SPM.

### *View License*




***For SPM users:***

Go to **Application Help > Product License**

The Product License window shows the details of the current SPM system.

The window displays the SPM version, serial number, and total number of supported CDUs.

Also shown are optional key features with enabled status: POPS, the SPM API, SNAP, RF Code Zone Manager, Custom Template, and Standalone SPM.

The STI-MIB-supported devices and the model names of supported OEM and competitor devices are also listed.

# Chapter 7: Using Application Help

The Application Help option is a collection of several informative and useful product support functions:

### *About SPM*

The About page shows the current SPM version, build, and release number; also displays the VMware serial number. A brief overview of SPM is also provided

### *Technical Support*

Server Technology's North American and global Technical Support page with contact information, email link, and support request link.

### *Product License*

Allows the Administrator (or Power User) to add a new license key provided by Server Technology. Displays the current number of licensed CDUs supported by SPM; the enabled/disabled status of POPS, SPM API, and SNAP; and the supported competitor devices currently in your network.

### *Support Tools*

Provides direct access to Server Technology's Technical Support team from within SPM. The Support Tools option is dedicated to SPM users with several useful services, including the ability to collect relevant operational details about your system to help solve specific issues. Also provided is at-a-glance viewing of the current values for the most common system parameters.

#### System Info Tab

Use the System Info Tab to query and view the most frequently asked about system data, such as the details of used/free disk space, used/free memory, last backup date, network name/address, and product serial number.

The System Info tab also provides a **Reboot** button to restart SPM just like a Telnet reboot session, and the **Restart Services** button to restart SPM like a single application.

**NOTE:** You must have a system administrative account to reboot SPM.

#### Communication Tests Tab

Use the Communication Tests Tab to: (1) query a specific CDU in your network with a Ping command, (2) perform an SNMP Walk function to retrieve SNMP management values through a Get request, and (3) use the Send Test Trap function to test a trap destination.

#### Support Package Tab

The Support Package Tab collects device operational data about specific CDUs to assist the Server Technology Technical Support team with system diagnostics. You can also email a message to the team with a few background parameters to get support started fast.

### *End User License Agreement*

Displays the full End User License Agreement document for SPM as a standard product.

### *Third Party Disclosure*

Displays the Third Party Disclosure GNU General Public License for related third party products.

### *Online Help System*

Opens the main page (Table of Contents) for the SPM Help system where you select individual topics of technical information about using SPM.

## Quick Configuration Tips

### *Fast Right-Click Configuration for Objects*

SPM offers several ways for quick access to the operational settings of SPM objects and user group permissions:

- Right-click an object in a list (CDUs list, Cabinets list, etc.), from the menu options, select a configuration option.
- Right-click an object in the SPM left pane, from the menu options, select a configuration option.
- From an object list (CDUs list, Cabinets list, etc.), select a configuration icon on the SPM toolbar. All objects in the list display in a new list with options for globally configuring specific parameters for all displayed objects.

### *Configuration: Toolbar Icons and Right-Click Menu Options*

| Icon | Menu Option | Description |
|---|---|---|
|  | **Configure [object]** | Opens a dialog box for setting parameters based on the object you select. |
|  | **Set CDU's Parent** | Opens a dialog box for setting parent location or cabinet. |
|  | **Configure Threshold** | Opens the dialog box for editing threshold values for the object. |
|  | **SNAP** | Opens the SNAP template to configure several types of Sentry firmware parameters. |
|  | **Configure User Group Permissions** | Opens the dialog box for the object's associated user group so you can assign various permission access levels to the user group for specific system objects. |

**NOTE:** The exact menu options, option names, and available configuration icons in the toolbar may vary slightly depending on the type of system object you select (and your user account level).

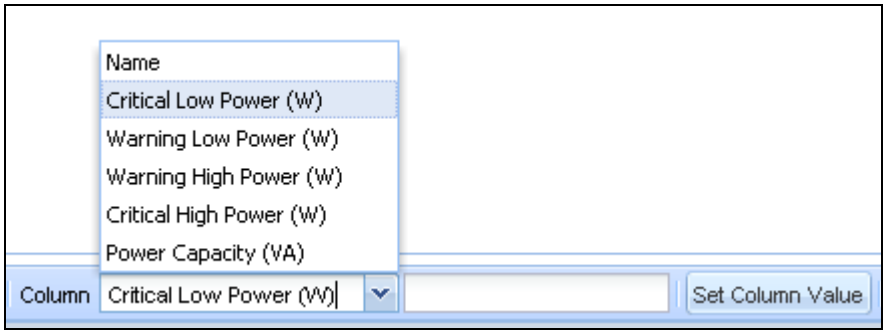
### *Mass Configuration of Object Threshold Values*

To apply a threshold value to all objects in an object list (for example the CDUs list, Cabinets list, etc.), from the object list, click the Configure Threshold  icon on the toolbar.

All objects from the list display in a new list that shows the editable threshold columns at the bottom of the window (sample below).

Select a column from the list, enter a value in the box on the right, and click **Set Column Value**. The threshold value will be applied to the column for all objects in the list.

**NOTE:** The exact column names as shown below will vary depending on the object list.

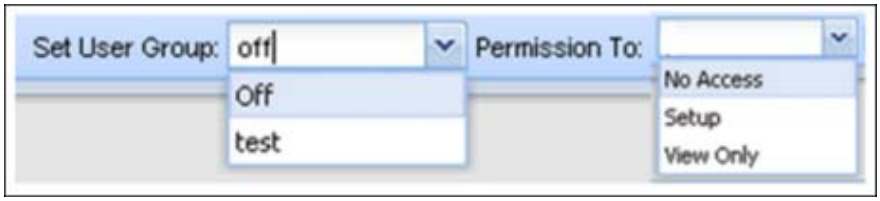


### *Mass Configuration of User Group Permissions*

To apply a user group permission globally to all objects in an object list (for example the CDUs list, Cabinets list, etc.), from the object list, click the Configure User Group Permission  icon on the toolbar.

All objects from the list display in a new list that shows the available user group names and permissions in drop-down lists at the bottom of the window (shown below).

Select a user group name, select a permission, and click **Save**. The permission is applied to all objects in the list associated with the selected user group.



# Chapter 8: Working with SNAP ™

SNAP™ is an SPM administration function that allows Sentry firmware parameters to be configured to CDUs directly from within the SPM interface by means of a SNAP "template".

The advantage of using SNAP is the fast network management by using the SPM interface to globally download the latest CDU operational parameters from Sentry firmware to a single CDU (or to multiple CDUs) in the SPM network.

The SNAP parameters now readily available in SPM are the same CDU parameters you would configure using the Sentry firmware Web interface or Command Line Interface (CLI).

## *System Requirements for SNAP*

For the SNAP templates and Sentry CDU parameters to display in the SPM interface, you must have the following items:

- SPM Administrative-level user account.
- SPM version 5.1 or greater.
- SPM-discovered CDUs with Sentry firmware version 6.1 or greater.

## *SPM System Objects for SNAP*

SNAP templates and CDU parameter fields are available in SPM only for the following SPM system objects:

- CDUs
- Cabinets
- Locations
- Zones

## *What is a SNAP Template?*

The SNAP template is a series of SPM windows that are the mirror-image of Sentry CDU parameters.

The parameters shown in the SNAP template are the same parameters you configure using the Sentry firmware, such as SNMP, Telnet, FTP/SNTP, LDAP, TACACS, and more parameter groups. All necessary CDU parameters are provided in SPM in the SNAP Template.

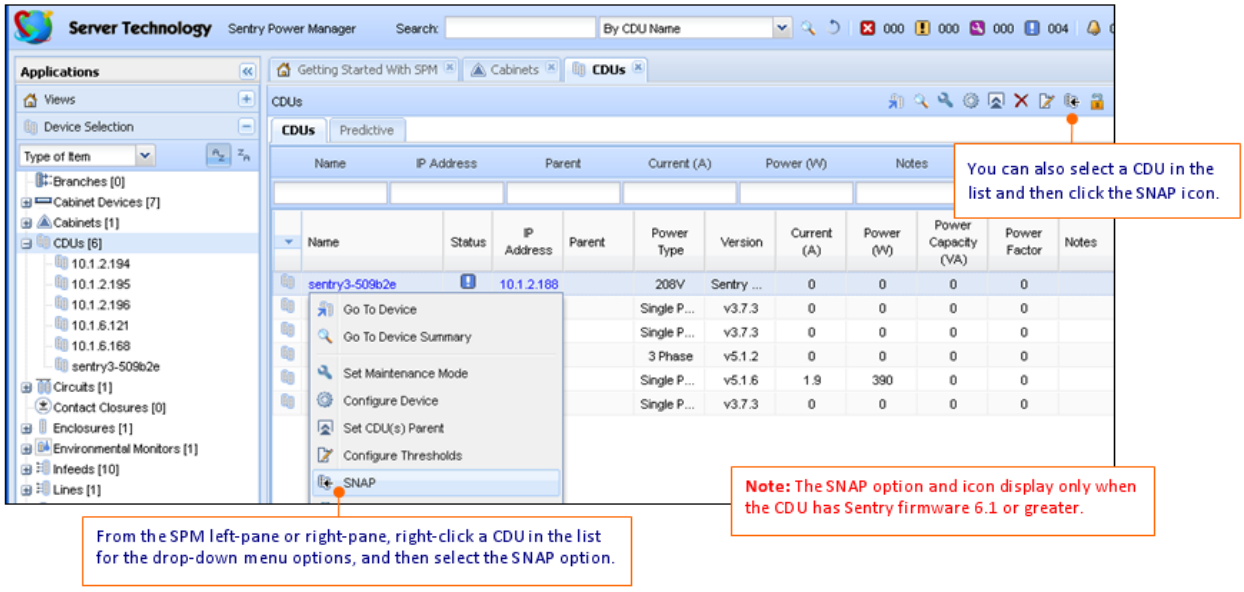
When you discover CDUs in the SPM network that have Sentry firmware 6.1 or greater, the default SNAP template shows the current parameter values exactly as they have been set in the CDU itself. You can then configure one or more parameters in the default SNAP template and assign the edited values to a different template that you can reuse on different CDUs.

### Mass Parameter Update

If the SPM administrator placed CDUs in a device hierarchy of cabinet, location, or zone, you can use a SNAP template (based on the same cabinet, location, or zone) to apply all CDU parameters to all CDUs in that hierarchy in one mass parameter update. You can also protect (bypass) one or more CDUs in the hierarchy from the mass update.

## How to Access SNAP

The SNAP menu option and icon are available for CDUs at **Device Selection > CDUs** or **Setup Items > CDUs**.



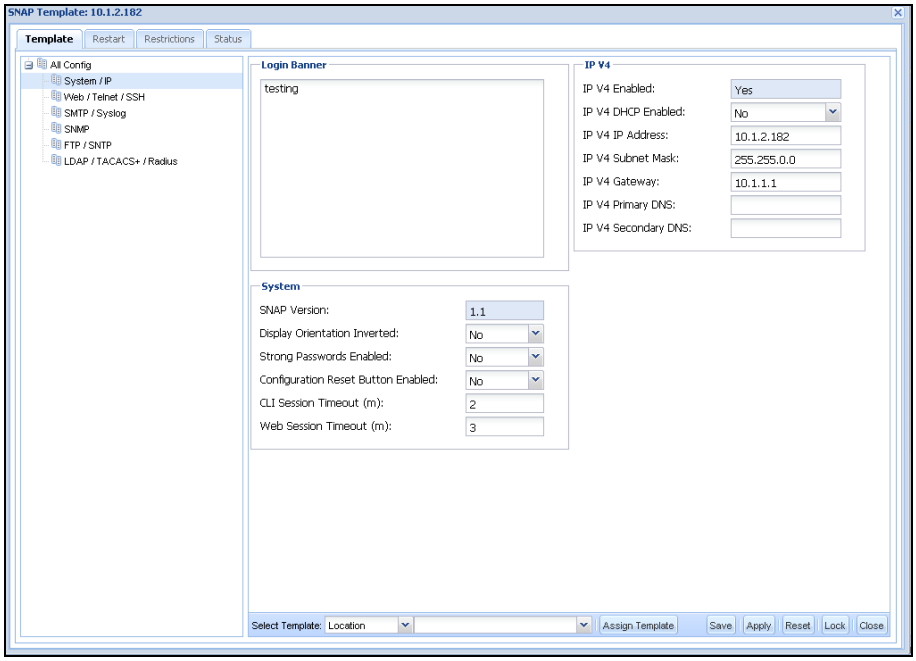

## SNAP Template Tabs

Selecting the SNAP menu option (or clicking the SNAP icon) displays the default SNAP template showing the Template, Restart, Restrictions, and Status tabs. Each tab is described as follows:

### Template Tab

For discovered CDUs in the SPM network with Sentry firmware 6.1 or greater, the SNAP template opens with the Template tab that showing parameter values as they were set in the CDU with the Sentry firmware interface (Web or CLI).

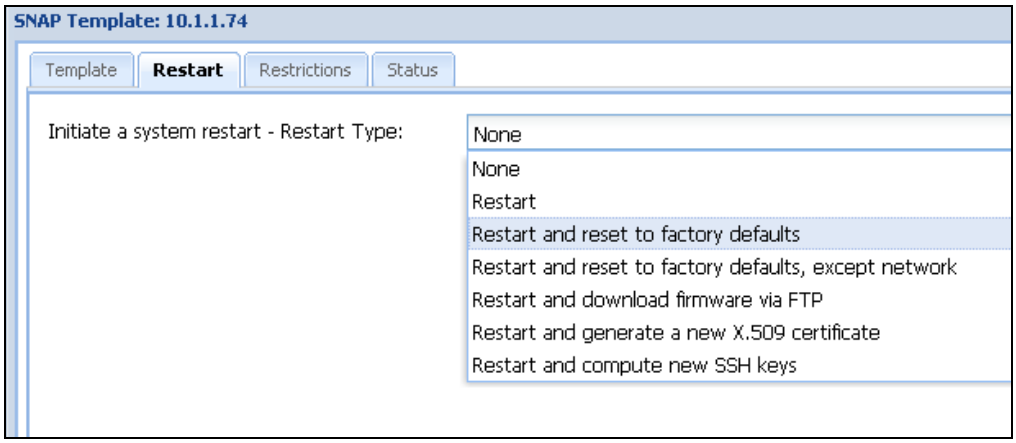
One or more parameters can be configured in the default SNAP template, and then saved to a different (new) template. The parameter values of the new template can be used on different CDUs.



### Restart Tab

The Restart tab allows resetting of the RAM in the CDU where configured options are stored. These options are the same as in the firmware Restart function.

The Reset function (in the “Restart and Reset to Factory defaults” option shown in the following example) clears configured options and resets them to their default values, including all user accounts.



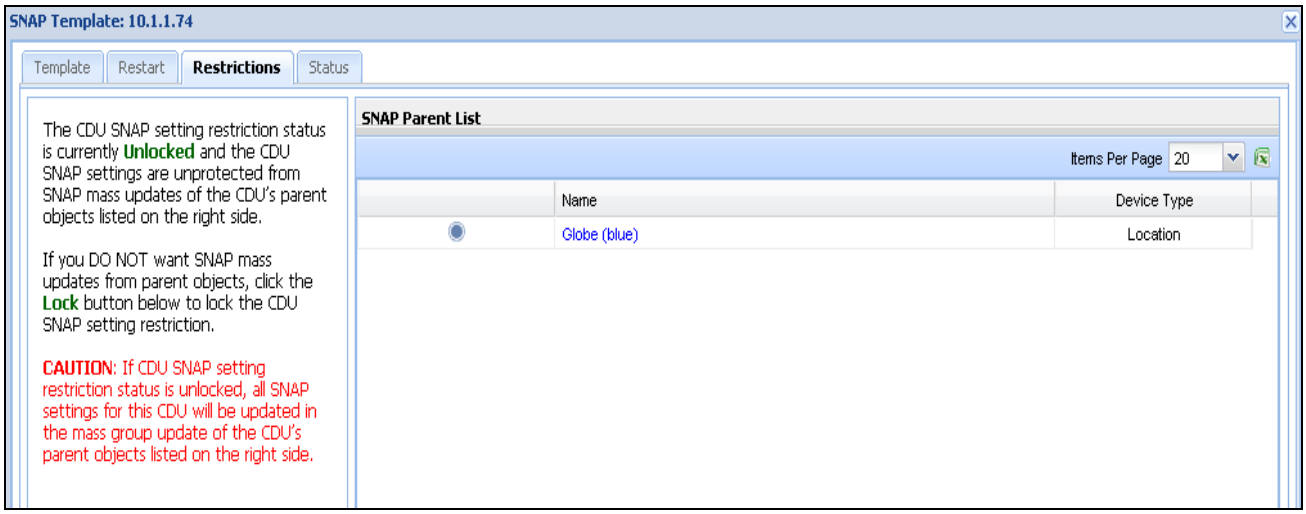

### Restrictions Tab

The Restrictions tab determine if the SNAP settings for the configured CDU protected (locked) or unprotected (unlocked) if any future SNAP mass updates are done by the CDU’s parent.

The parent of the CDU can be a cabinet, location, or zone as identified in the SNAP Parent list, shown in the following example.

A **Lock** (protect) button and an **Unlock** (unprotect) button on the Restrictions window (not shown in the following example), determines whether the SNAP parameter settings for an individual CDU (or all CDUs under the hierarchy of the same parent) are mass-updated or bypassed.

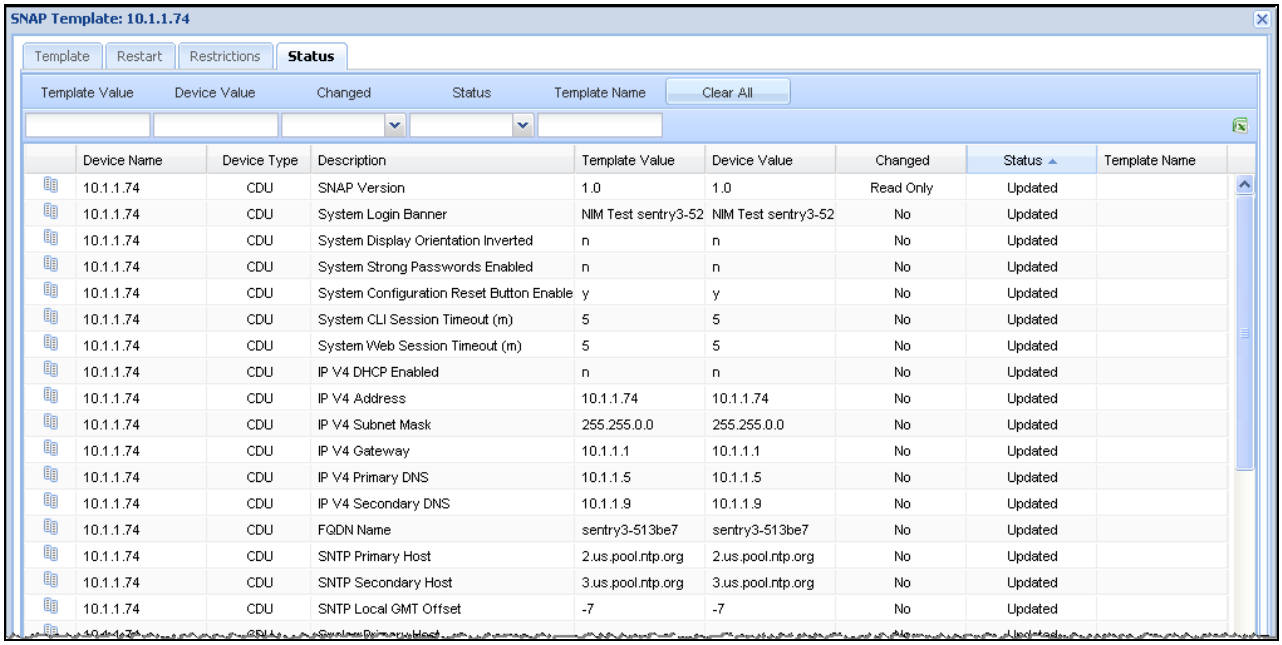
The caution statement in the left pane reminds you that the Unlock (unprotect) function allows the updating of **all SNAP CDU settings for all affected CDUs**.



### Status Tab

The SNAP Status tab is a report that mirrors the current SNAP parameters as assigned to a CDU by SPM.

SNAP Status shows a list of SNAP CDU settings and their values for a specific CDU, shows whether the parameter setting was updated, and displays the name of the SNAP template used.




| Device Name | Device Type | Description | Template Value | Device Value | Changed | Status | Template Name |
|---|---|---|---|---|---|---|---|
| 10.1.1.74 | CDU | SNAP Version | 1.0 | 1.0 | Read Only | Updated | |
| 10.1.1.74 | CDU | System Login Banner | NIM Test sentry3-52 | NIM Test sentry3-52 | No | Updated | |
| 10.1.1.74 | CDU | System Display Orientation Inverted | n | n | No | Updated | |
| 10.1.1.74 | CDU | System Strong Passwords Enabled | n | n | No | Updated | |
| 10.1.1.74 | CDU | System Configuration Reset Button Enable | y | y | No | Updated | |
| 10.1.1.74 | CDU | System CLI Session Timeout (m) | 5 | 5 | No | Updated | |
| 10.1.1.74 | CDU | System Web Session Timeout (m) | 5 | 5 | No | Updated | |
| 10.1.1.74 | CDU | IP V4 DHCP Enabled | n | n | No | Updated | |
| 10.1.1.74 | CDU | IP V4 Address | 10.1.1.74 | 10.1.1.74 | No | Updated | |
| 10.1.1.74 | CDU | IP V4 Subnet Mask | 255.255.0.0 | 255.255.0.0 | No | Updated | |
| 10.1.1.74 | CDU | IP V4 Gateway | 10.1.1.1 | 10.1.1.1 | No | Updated | |
| 10.1.1.74 | CDU | IP V4 Primary DNS | 10.1.1.5 | 10.1.1.5 | No | Updated | |
| 10.1.1.74 | CDU | IP V4 Secondary DNS | 10.1.1.9 | 10.1.1.9 | No | Updated | |
| 10.1.1.74 | CDU | FQDN Name | sentry3-513be7 | sentry3-513be7 | No | Updated | |
| 10.1.1.74 | CDU | SNTP Primary Host | 2.us.pool.ntp.org | 2.us.pool.ntp.org | No | Updated | |
| 10.1.1.74 | CDU | SNTP Secondary Host | 3.us.pool.ntp.org | 3.us.pool.ntp.org | No | Updated | |
| 10.1.1.74 | CDU | SNTP Local GMT Offset | -7 | -7 | No | Updated | |

## *Apply SNAP Parameters Globally to CDUs*

Although you can use SNAP to apply CDU parameters to one CDU at a time, SPM allows you to apply all CDU parameters to all CDUs with a single SNAP template.

You can use a single cabinet, location, or zone SNAP template to push CDU firmware parameters down to every CDU within the hierarchy of the cabinet, location, or zone – all in one action.

For example, If a location in your SPM network contains 100 CDUs, a single SNAP temple action can automatically mass-update the entire 100 CDUs in the location's hierarchy (as long as the CDUs have Sentry firmware version 6.1 or greater).

One or more CDUs in the hierarchy can be locked (protect). The Lock (protect) function prevents the mass-updates from the parent cabinet, location, or zone to be applied to the specified and locked CDU. You can easily toggle to unlock (unprotect) one or more CDUs so that mass-updates from the parent are applied to the CDU.

## *Selected Update (Filtering) of SNAP Template Settings*

**NOTE:** Selected update of SNAP template settings applies only to cabinets, locations, and zones.

The Selected Update function allows selecting of specific settings in a SNAP template for editing while the other settings in the template are left unchanged.

You can edit settings as desired at **SNAP > Template**, for example, change the value of "Display Orientation Inverted" (this field is in the System group of the template).

Then go to the **SNAP > Status** list, and from the Group drop-down filter, select "System".

The Status list is now filtered and only the fields in the System group are displayed. You will see the "Display Orientation Inverted" field in the filtered list.

Check the Selected checkbox for "Display Orientation Inverted", and your edit will be applied without changing any other settings in the System group or any other group of the SNAP template.

## *Using the SNAP Template with Zones*

***TIP: Switched and Smart CDUs in SNAP Zones***

You can create a new zone (example, Zone 1) for Switched CDUs and edit the Switched parameters as you prefer.

Then, create a another new zone (example, Zone 2) for Smart CDUs and edit the Smart parameters as you prefer, but change the FTP parameters in Zone 2 to be specific to Smart CDU firmware uploads.

Now you have a SNAP Zone template for Switched CDUs (Zone 1) with Switched CDU FTP parameters that can be pushed in a SNAP mass update for only the Switched CDUs under the hierarchy of Zone 1.

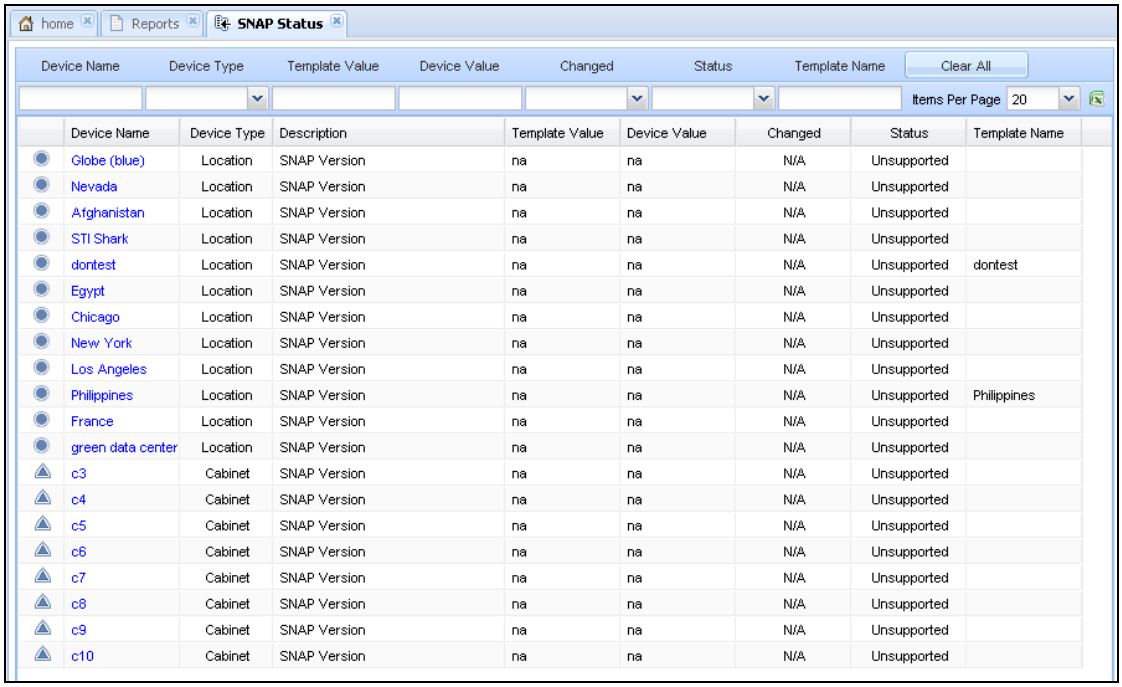
You also have the SNAP Zone template for Smart CDUs (Zone 2) to globally push FTP parameters for only the Smart CDUs under the hierarchy of Zone 2.

## *The SNAP Report*

The SNAP™ report shows Sentry firmware parameter configuration settings. Configuration values displayed on the report were configured using SNAP templates.

### Sample of SNAP Report

The following sample of a SNAP report shows details about firmware parameter settings:




| Device Name | Device Type | Description | Template Value | Device Value | Changed | Status | Template Name |
|---|---|---|---|---|---|---|---|
| Globe (blue) | Location | SNAP Version | na | na | N/A | Unsupported | |
| Nevada | Location | SNAP Version | na | na | N/A | Unsupported | |
| Afghanistan | Location | SNAP Version | na | na | N/A | Unsupported | |
| STI Shark | Location | SNAP Version | na | na | N/A | Unsupported | |
| dontest | Location | SNAP Version | na | na | N/A | Unsupported | dontest |
| Egypt | Location | SNAP Version | na | na | N/A | Unsupported | |
| Chicago | Location | SNAP Version | na | na | N/A | Unsupported | |
| New York | Location | SNAP Version | na | na | N/A | Unsupported | |
| Los Angeles | Location | SNAP Version | na | na | N/A | Unsupported | |
| Philippines | Location | SNAP Version | na | na | N/A | Unsupported | Philippines |
| France | Location | SNAP Version | na | na | N/A | Unsupported | |
| green data center | Location | SNAP Version | na | na | N/A | Unsupported | |
| c3 | Cabinet | SNAP Version | na | na | N/A | Unsupported | |
| c4 | Cabinet | SNAP Version | na | na | N/A | Unsupported | |
| c5 | Cabinet | SNAP Version | na | na | N/A | Unsupported | |
| c6 | Cabinet | SNAP Version | na | na | N/A | Unsupported | |
| c7 | Cabinet | SNAP Version | na | na | N/A | Unsupported | |
| c8 | Cabinet | SNAP Version | na | na | N/A | Unsupported | |
| c9 | Cabinet | SNAP Version | na | na | N/A | Unsupported | |
| c10 | Cabinet | SNAP Version | na | na | N/A | Unsupported | |

# Chapter 9: Using the RF Code Wire-Free Monitoring Solution

The RF Code Zone Manager Wire-free Solution is an optional key-activated feature to use with SPM.

The joint solution integrates Server Technology's intelligent Cabinet Distribution Units (CDUs) and SPM with RF Code's wire-free system of sensor devices and software for real-time, wire-free power and environmental reporting.

The result is intelligent monitoring that has the capability of transmitting critical environmental data over a flexible, cost-effective, and wire-free infrastructure for better management and control of power and operational costs

The solution includes the following RF Code devices:

- Small, battery-powered, wire-free sensor tags
- Networked readers that receive sensor data
- Software that collects and organizes information – the Zone Manager

## *RF Code Devices*

The wire-free monitoring solution includes the following RF Code devices:

### Sensor Tags

RF Code sensor tags are small, battery-powered, and wire-free. Tags are available in a wide range of styles and mounting options for easy and flexible deployment anywhere in the data center.

The following styles are a few of the RF Code sensor tags available for flexible deployment in the data center. Each style can be integrated with SPM and the wire-free monitoring solution:

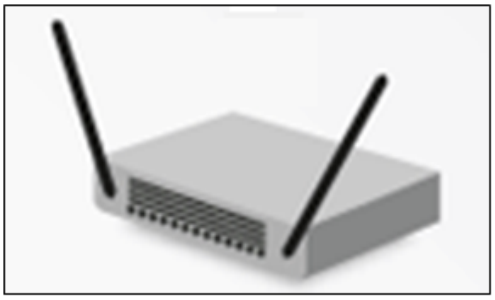

The wire-free design eliminates wired connections and IP address overhead to each CDU. With a patented communications protocol, the sensor tag has an exceptional RF range and performance around dense metal environments, such as data center racks and servers, even functioning when placed inside a fully enclosed rack.

Depending on the type of sensor tag, the device life ranges from 3 to 5 years. Tags have a field-replaceable battery and a standard 10-second beacon rate. Mounting options include adhesive, zip-tie lanyard, and screw attach plate

### RF Code Readers

The active RFID readers are high-density with an integrated rules engine. Wired, wire-free, and POE models are available.

The readers use the RF Code open API to receive and collect sensor readings from all deployed and active RF Code sensor tags throughout the data center. The readers then transmit collected data to the Zone Manager software product.



The readers connect to an IP network with multiple, simultaneous connections. Typically, the wire-free monitoring solution allows for one Zone Manager and many readers positioned around the data center. Each wire-free reader can handle 1,400 sensor tags and is capable of a wide communication range, covering from 3,000 to 5,000 square feet.

### Zone Manager

The Zone Manager is the RF Code software product that collects and organizes environmental readings received from deployed readers. The product then provides 1-way reporting through its open API directly to SPM.

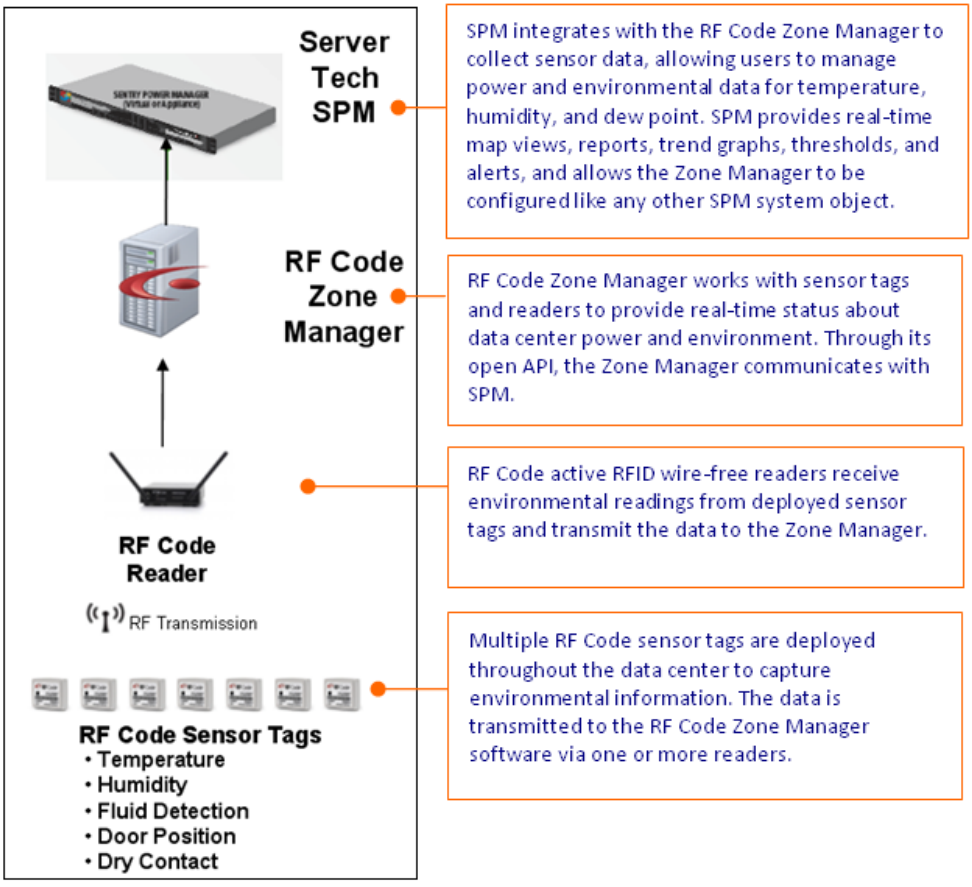

Considered to be the middleware component in the wire-free monitoring solution, the Zone Manager functions as the networked location engine that manages all deployed readers in the system.

CDU readings are rolled-up by the Zone Manager and sent to SPM where lower critical/warning and upper warning/critical thresholds for temperature, humidity, and dew point are reported. Also reported are battery time thresholds and sensor status.

## *Integration with SPM*

Sentry Power Manager (SPM) version 5.3 and greater supports the monitoring of RF Code sensor tags.

Once SPM is integrated with the RF Code open API through the purchased software license key, the monitoring infrastructure and deployed tracking devices are automatically available. Data center power and environmental information can then be managed from one central location using the SPM user interface.



# Chapter 10: Data Tracking with Custom Device Templates

SPM's Custom Device Template is the key-activated feature for data collection that allows communication, tracking, and reporting for any SNMP-enabled device you create to export data from within SPM.

The Custom Device Templates feature tracks a subset of the operational values for devices that are not otherwise in communication with SPM; for example, an unsupported PDU, UPS, or printer.

## *How the Custom Template Works*

You create a new custom template, configure the template values for specific device attributes, apply the values to the new device when adding the device to SPM (simply select the new template by name to apply values to the device), and the custom device values can then be tracked and monitored in several places throughout the SPM interface.

The Custom Device Templates feature has the capability of tracking data center power from within SPM using a single value in an unsupported device (like a UPS). In addition, the feature offers the convenience of letting you add individual infeeds and outlets directly to SPM one at a time as needed.

**NOTE:** Thresholds can be a custom number but the threshold value will not be used to determine device alarms.

## *Supported Custom Device Values*

SPM supports three groups of values so you can apply a value that is unique to the custom device and then track the value:

- **Whole Device Level:** Device model, version, serial number, power type, total power (watts), manufacturer custom text (any string value), and a maximum of three custom numeric fields (any numeric value).
- **Infeed:** Index, name, current(amps), power(watts), voltage(volts), apparent power(volt-amps), and power factor(%).
- **Outlet:** Index, name, current(amps), power(watts), voltage(volts), apparent power(volt-amps), and power factor(%).

## *Re-Associating the Device with a Revised Template*

Once a custom template is associated with a custom device (the association is made as you add the device to SPM and select the template by name), if you then edit values in the template, the revised template (because it changed) is disassociated from the custom device.

To re-associate the revised template with the same custom device (apply changes made to that template for an existing device), you will need to do the following:

1. Delete the device from SPM.
2. Re-add the device to SPM.
3. Select the revised template.

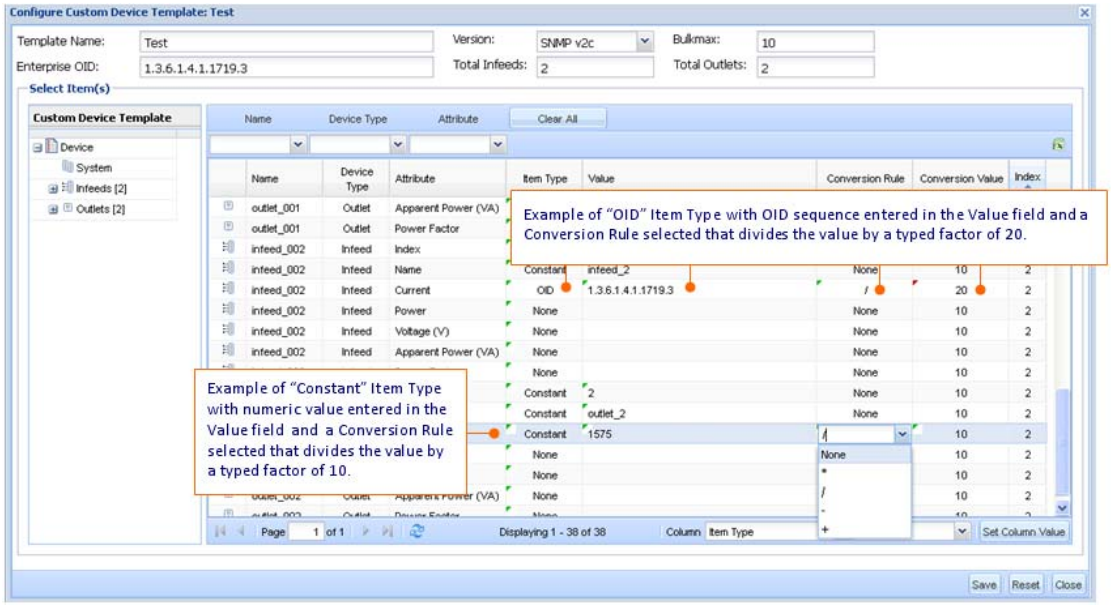
The re-association between the device and the revised template is now established.

**NOTE:** Note any historical data associated with the device and the previous template (before the template was edited) will be lost.

## *Converting Values*

Some values in a custom device may need to be converted to be correctly displayed in SPM; other values in that same device may not need conversion. Operational values will vary by product and manufacturer. Each custom device will have its own values and meaning, so there are no fixed rules for conversion.

If conversion is necessary, the Configure Custom Device Template window provides a conversion procedure. The example below shows the Item Types “Constant” and “OID”.




### If the Item Type is “Constant”

When you select Item Type “Constant”, you enter a numeric Value (for example, 12755), and use the conversion rule to divide by 10, add a new custom device to SPM and apply your custom template (using the New Device box), when you view the device in the CDUs list and look at its infeeds, you will see the SPM-acceptable value of 1275.5 shown as the value.

### If the Item Type is “OID”

When you select Item Type = OID, enter an OID Value (for example, 1.3.6.1.4.1.1719.3.1.4.5.1 or a similar sequence), the OID will obtain the device value through SNMP.

If an OID needs to be converted using division, the extra data will be truncated. For example, if the device is reporting power as 32.9, the value will be shown in the OID as 329 (there are no decimal places in SNMP).

To correctly represent the device’s power in SPM, the value must be converted to a whole number. This means you will need to divide the OID by 10 (using the Conversion Rule field and the Conversion Value field as described in the previous screen example). The value displayed in SPM will show as 32. Notice the “.9” was truncated and no rounding was performed.

### Value Conversion Table

| Description | SPM Screen Value [1] | Required Converted Value |
|---|---|---|
| Current | 5.25 | 525 |
| Voltage | 120.5 | 1205 |
| Power | 68 | 68 |
| Apparent Power | 68 | 68 |
| Power Factor | 0.95 | 95 |
| Total Power | 35 | 35 |

1 = Value displayed in SPM; shows maximum decimal place supported.

# Appendix A: Product Information

This chapter provides SPM product information about links to product warranty, registration, regulatory compliance, contacting Technical Support, and the Return Merchandize Authorization (RMA).

## Warranty

For Server Technology warranty information, please see our website at www.servertech.com

## Product Registration

Registration is your key to special offers and services reserved for Registered Users.

- Excellent Technical Support Services
- Special Update and Upgrade Programs
- Warranty Protection
- Extended Warranty Service
- New Product Information

Register your product on our website at: www.servertech.com

## Regulatory Compliance

Products with the following mark comply with the RoHS Directive (2002/95/EC) issued by the Commission of the European Community.

### *Recycling*

Server Technology Inc. encourages the recycling of its products. Disposal facilities, environmental conditions and regulations vary across local, state and country jurisdictions, so Server Technology encourages consultation with qualified professional and applicable regulations and authorities within your region to ensure proper disposal.

#### Waste Electrical and Electronic Equipment (WEEE)

In the European Union, this label indicates that this product should not be disposed of with household waste. It should be deposited at an appropriate facility to enable recovery and recycling.

## Technical Support

**Experience Server Technology's FREE SMARTER Technical Support**

Server Technology understands that there are often questions when installing and using a new product. Free Technical Support is provided from 8:00 a.m. to 5:00 p.m. PST, Monday through Friday. After-hours service is provided to ensure your requests are handled quickly no matter what time zone or country you are located in.

Server Technology, Inc.

| | | | | |
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### *Return Merchandise Authorization*

If you have a unit that is not functioning properly and is in need of technical assistance or repair, see the Server Technology Return Merchandize Authorization (RMA) process on our website at: www.servertech.com

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