Server Technology

Sentry : Solutions for the Data Center Equipment Cabinet

Sentry Power Manager (SPM)

Quick Start Guide

- SPM Release 5.0

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.

Life-Support Policy

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)

Sentry Power Manager (SPM) is a 1U appliance and software package that continually measures, monitors, and trends an enterprise-wide network of Sentry Cabinet Power Distribution Units (CDUs) in your data center. From a single user interface, SPM offers global device control along with detailed, rack-level control of your entire IP network of Switched and Smart CDUs, as well as other devices.

SPM discovers all CDUs in your IP network and offers both a global view of these networked units as well as a detailed view with the capability of managing units based on temperature, humidity, load, and operational status. Units in multiple physical locations can be accessed from a single SPM interface, including quick access to device alarm management.

How SPM Benefits Your Data Center

SPM provides many significant benefits for a single data center, as well as for multiple remote facilities:

- Gives a global view of all Sentry CDUs in your network and lets you drill down quickly from the global view to the background images and maps of your data center to see further into the operational details of the CDU.
- Monitors and manages user-defined alarm conditions throughout your network.
- Calculates your Power Usage Effectiveness (PUE) for data center efficiency metrics and green initiatives.
- Monitors the power of Per Outlet Power Sensing (POPS) units.
- Clusters outlets together for remote reboot and power measurement information across a single CDU, a linked CDU, or across your entire network of CDUs.
- Measures power consumption for capacity planning.
- Provides multiple user levels (and user groups) with multiple capabilities, including LDAP support.
- Allows full On, Off, and Reboot control actions over individual outlets on Switched CDUs in your network.

System Defaults

Upon connection to SPM, note the following SPM system-wide defaults and how to change them.

Telnet

Telnet is turned **OFF**.
Enable Telnet at **System Setup** > **Configuration tab** > **Settings** > **Telnet**.

Secure Shell (SSH)

SSH is turned **ON**.
Disable SSH at **System Setup** > **Configuration tab** > **Settings** > **SSH**.

Temperature Readings

Temperature Readings are in **CELSIUS**.
Change temperature readings to Fahrenheit at **System Setup** > **Configuration tab** > **Settings** > **Temperature**.

Area Units

Area Units are in **METERS**.
Change Area Units to square feet at **System Setup** > **Configuration tab** > **Settings** > **Area Units**.

The SPM API

The Application Program Interface (API) is a 3rd-party interface integration tool that allows SPM to communicate power and environmental data to your existing Building Management System (BMS), or other monitoring and measurement systems.

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.

About This Guide

Your Sentry Power Manager (SPM) 5.0 Quick Start Guide is a shortened version of the online Help system available from within the SPM 5.0 user interface.

This guide provides brief explanations and overviews of the most important parts of the SPM 5.0 process in a traditional PDF format for quick reference when you're not logged in to SPM to use the Online Help system.

For step-by-step instructions and functional details not found in this guide, please access the online Help system directly from the SPM 5.0 user interface. When logged in to SPM, click **Application Help > On-Line Help System**. Navigation within the Help system is available through hot-linked topics in the Table of Contents, a word search feature, and a glossary of SPM terms.

In addition, right-clicking certain window areas of the SPM 5.0 user interface provides direct access to the online Help system called "context-sensitive" access – this means the online Help system opens with the information topic that relates specifically to the current SPM function you're working with. For example, **right-click** in the Trends list, select the **Trend Help** option, and the online Help system opens with the Trends topic so you have the right information at the right time.

More SPM Resources

In addition to this Quick Start Guide, Server Technology has provided a number of useful resources to get you up to speed fast with SPM:

On the Server Technology website: www.servertech.com

- SPM Product Data Sheet
- Brief SPM Videos
- SPM Product Page
- SPM Technology White Paper

Integrated with the SPM 5.0 Interface:

- Online Help System (search by Help topic or right-click SPM interface for "context-sensitive" help)
- SPM Hyper***fast*** Setup Guide (for basic SPM appliance setup), available as a PDF in the Help system.
- SPM Hyper***fast*** Setup Guide (for redundant SPM appliance setup – Part #SPM-APPR), available as a PDF in the Help system.

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: Touring the SPM Workspace

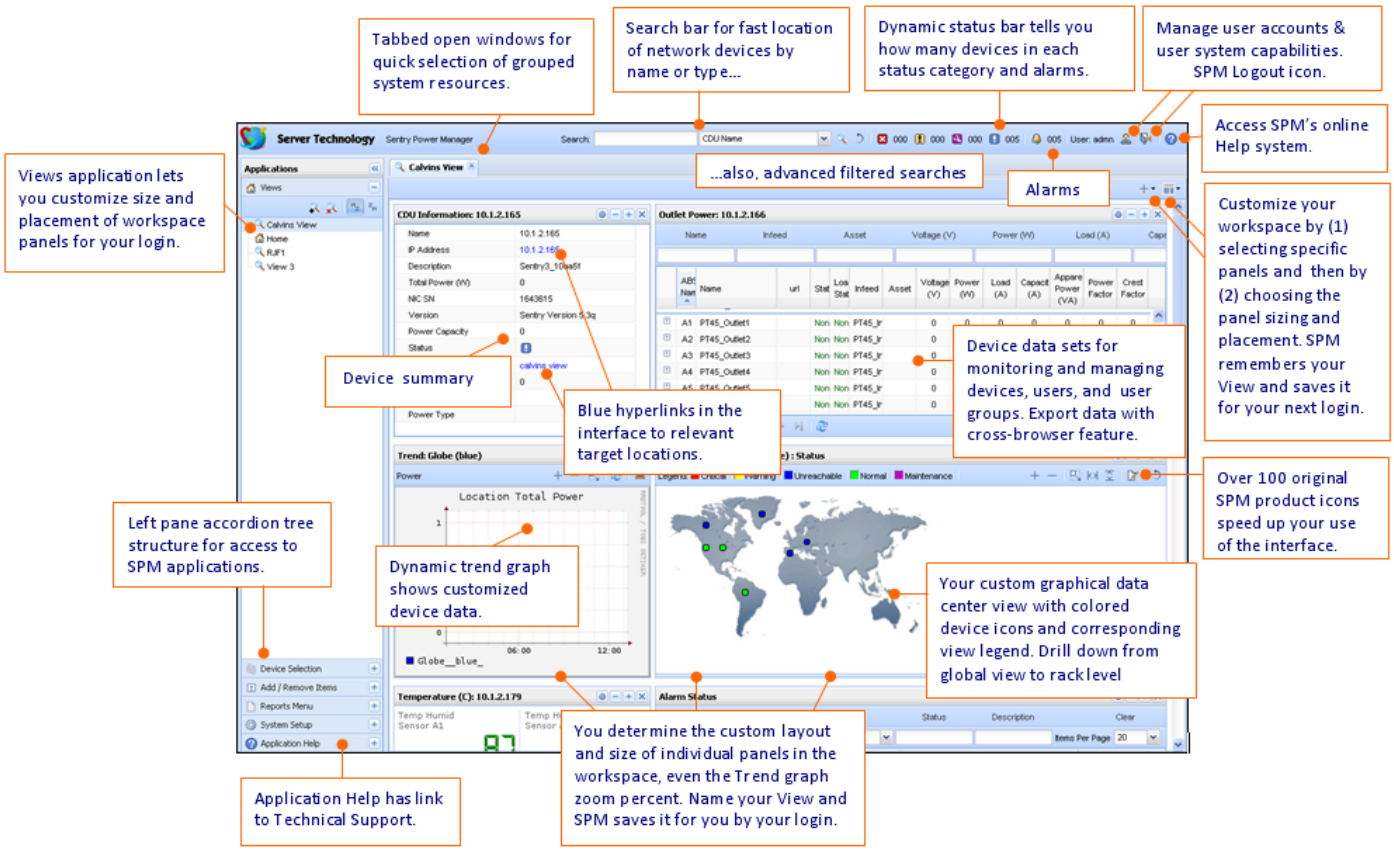
This chapter introduces the SPM interface and the major features of the SPM window design and Views workspace.

SPM User Interface

The SPM user interface allows multiple views of data or several configuration tools to be opened and managed at the same time. The interfaces make use of a left-pane accordion tree, tabbed panels in the right-pane, header/footer areas, and a user-defined custom workspace.

SPM Interface at a Glance

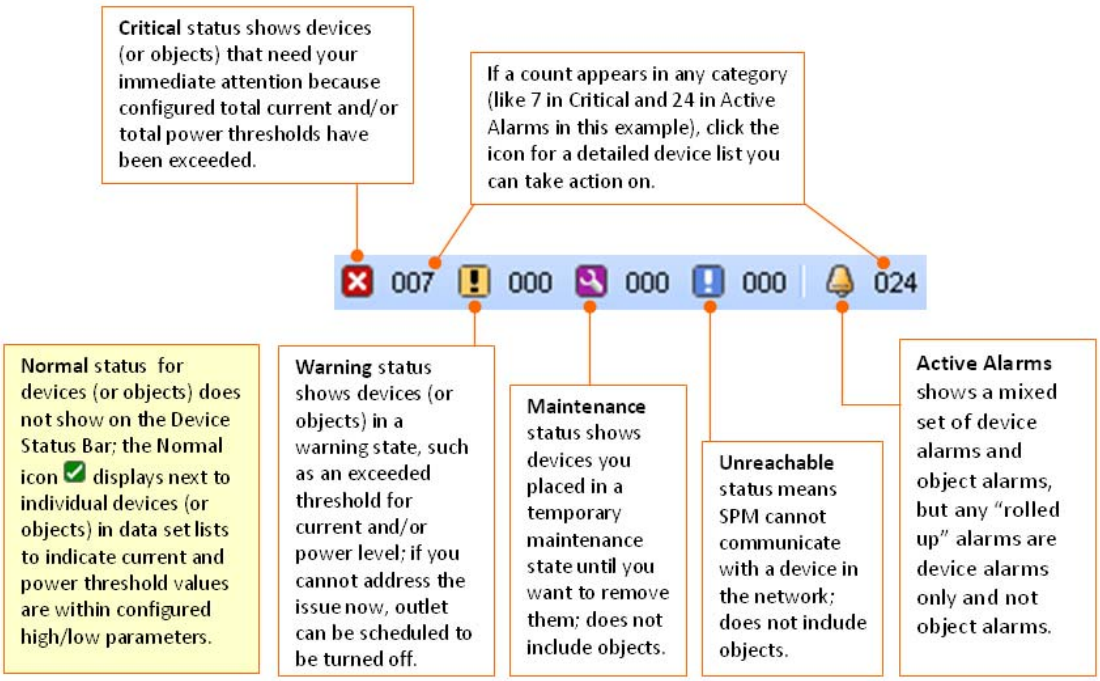
The following sample of the interface introduces you to the major window areas and functions of SPM



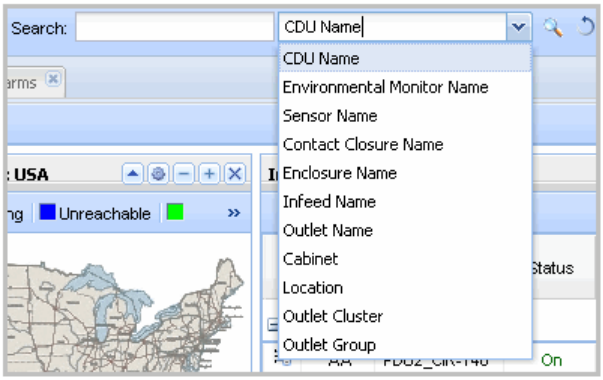
Device Status Bar

The Device Status Bar at the top of the SPM main window provides at-a-glance monitoring of the combined results of operational status and alarms for devices and main system objects.

If the administrator configures operating thresholds, SPM monitors the amount of total current and/or total power that each device or object has and shows dynamic results in the status/alarm categories on the Device Status Bar, as illustrated below:



The Search Bar

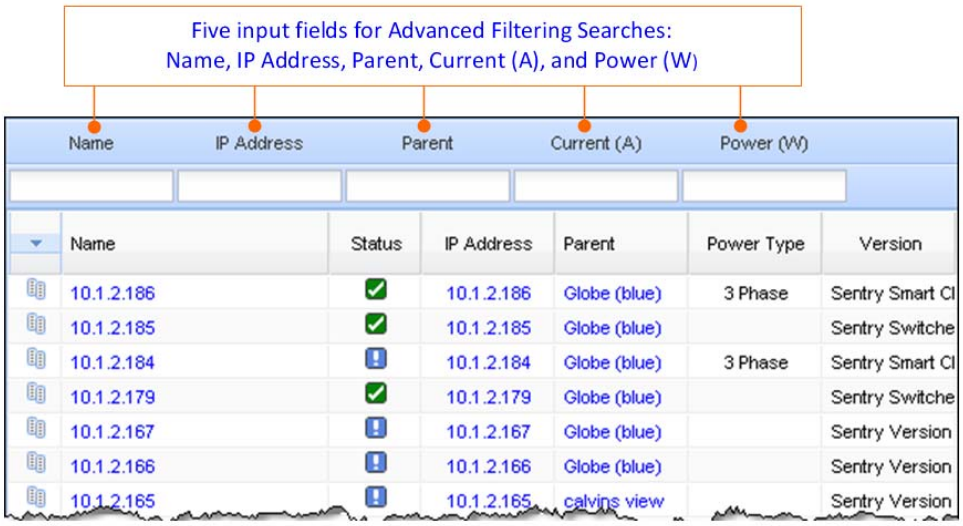


The search bar provides a quick search for a discovered device or system object in the network.

The search bar displays at the top of the main SPM window and allows you to locate devices or objects by several different search parameters.

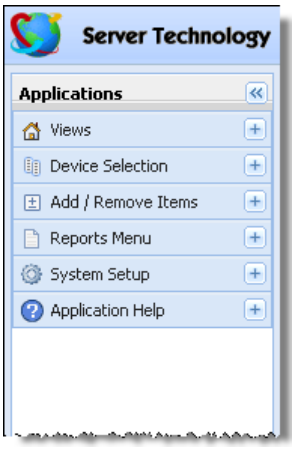
Advanced Filter Searches

The Advanced Filtering Search tool provides a fast and highly flexible search for devices in large data sets. The five input fields you use to activate the search feature are displayed at the top of SPM data sets (lists), like the CDU data set in the following example:



NOTE: If you use the filtered searches and then export the data set to Excel, the filtered data set will be exported, not the original data set.

Left-Pane Navigation



The SPM interface is designed with a left pane navigation panel so you can easily locate and access product applications and resources.

Each application is shown collapsed in the left pane:

- Views
- Device Selection
- Add / Remove Items
- System Setup
- Application Help

SPM applications in the left pane

Views

The Views application is the gateway to SPM, providing at-a-glance monitoring and management of your enterprise. Views lets you customize the SPM modules you want to work with and remembers your preferences by login, such as how you placed and sized panels in the Views workspace. Multiple SPM users can each have their own customized Views.

Device Selection

The Device Selection application displays a tree-structure list of network devices for monitoring and managing. You choose the way the data set displays: by device hierarchy, type of item, IP subnet, or device status. Note that some PDU competitors do not provide a subnet mask to SPM for their devices. Therefore, if you select Device Selection > IP subnet, certain competitor devices may not display in the left pane list.

Add/Remove Items

The Add/Remove Items application lists devices and device-related system items – like outlet clusters and outlet groups -- for quick access. This application also provides access to Device Discovery and Schedule Tasks features.

Reports Menu

The Reports Menu application provides access to customized user reports, trend graphs, the system log, a history of device alarms, and current active alarms.

System Setup

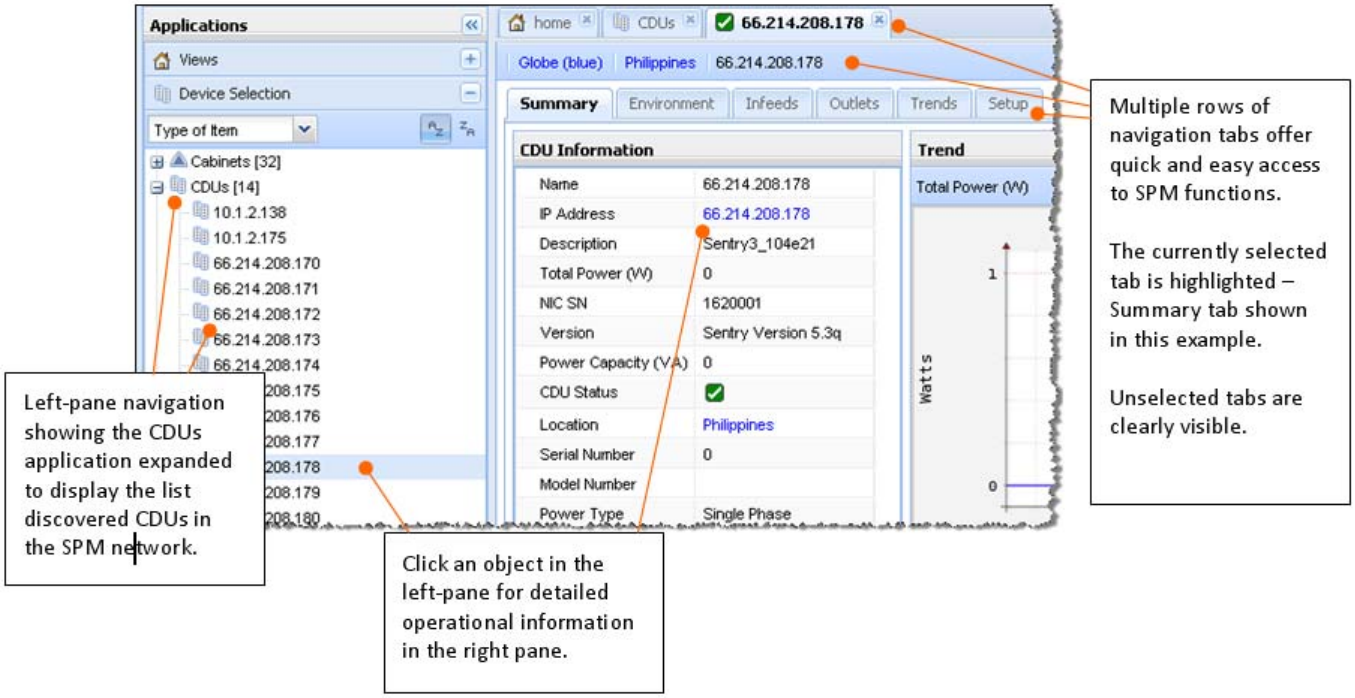
The System Setup application provides access to configuration settings (SPM system, SNMP, Server, and Syslog); parameters for managing users, user capabilities, and user groups; and adding a new SPM software license key.

Application Help

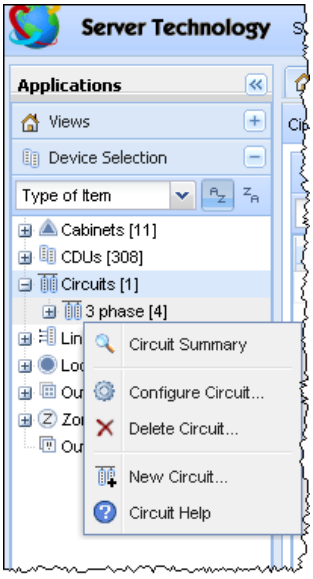
Provides quick access to Technical Support contact information, your current SPM product license, the End User License Agreement (EULA), the third-party license disclosure, and access to the starting page of the SPM online Help system.

Navigation Tabs

The left-pane navigation section of the SPM interface coordinates with the navigation tabs in the right pane for rapid access and selection. The example below shows a CDU selected in the left pane and the resulting CDU Summary tab displays with the CDU's operational details.



Right-Click Menus and Icons



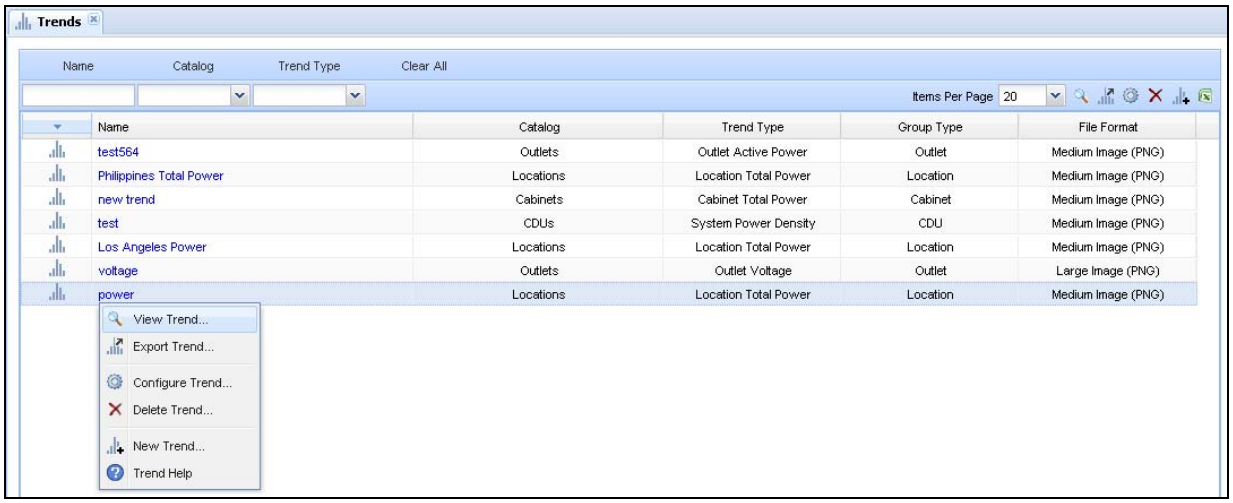
The SPM interface is designed with a right-click option for fast access to functionality and system resources.

Right-click menus are available on item types selected in the left navigation pane, for example, the following right-click on a specific drop-down item type (like the Circuit named "3 phase" shown to the left) to display the same options available as icons on the Circuits list.

Right-click menus are also available from an object list, such as the Outlet Clusters list shown to the left.

The example shows the menu options available when right-clicking on the outlet cluster named "15-25".

The Trends list below shows a right-click menu on one of the trend graphs listed. The options available are the same as the icons in the upper right toolbar of the Trends list.



User Account Controls

The User Account Controls feature allows the administrative-level account to configure the parameters of SPM users, user groups, and LDAP settings. Individual user logins can also manage their account parameters and preferences.

SPM user capabilities

Capabilities are the predefined levels of access rights to the device-related operational functions of SPM as granted by the administrator to individual users in named user groups.

SPM recognizes the following user types and capabilities:

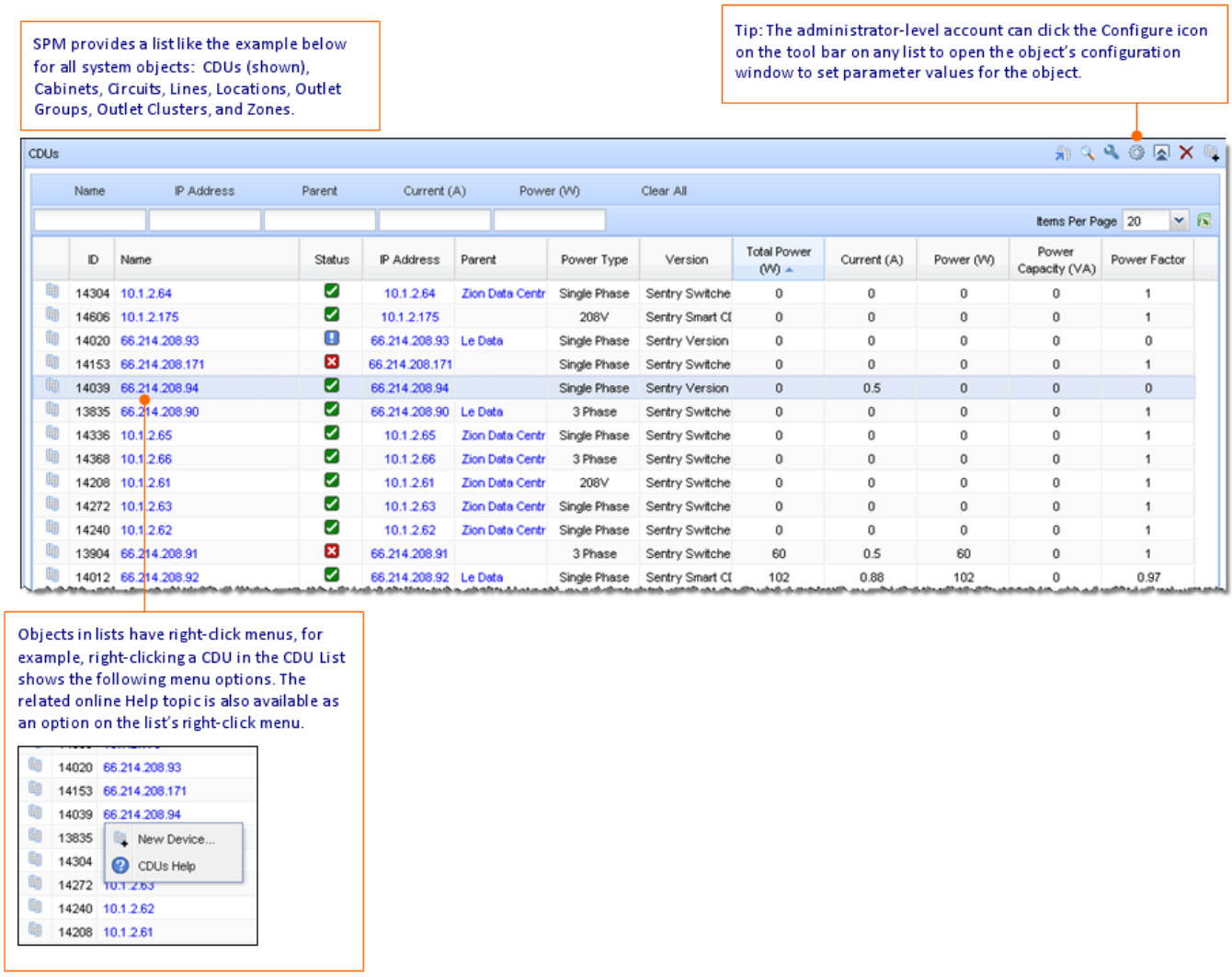
SPM User Types

Type	Capability
Administrator	Full access for all configuration, control (On, Off, Reboot), status, and serial/pass-thru ports. The SPM default administrative user is the **admn** username (password is also **admn**). Note there is no "l" in the **admn** username/password. The **admn** user can grant full administrative access rights to other users. **NOTE:** For security, Server Technology recommends that you first use the **admn** user account to grant capabilities to another administrative user account. Then use the new account to change the default **admn** username and password. The **admn** account cannot be deleted or demoted.
On	Allows user access to turn on an outlet. A user assigned access to an outlet (that is currently turned off) can turn the outlet back on again with the On capability but cannot turn the outlet off.
Regular	Partial access to control (On, Off, Reboot), status, and pass-thru of assigned outlets, outlet groups, outlet clusters, and serial/pass-thru ports.
Reboot	Partial access for control (Reboot), status, and pass-thru of assigned outlets, outlet groups, outlet clusters, and serial/pass-thru ports.
View Only	Partial access for status and pass-thru of assigned outlets, outlet groups/clusters, and serial/pass-thru ports.

Working with Lists (Data Sets)

The Intelligent Data Grid Management feature designed into SPM lists provides an efficient method for managing large blocks of data. Features of the SPM lists include methods for sorting and grouping data, the ability to show or hide columns, and provisions for exporting data in the selected list to an external format, such as an Excel worksheet.

Advanced filtering techniques let you quickly manage simple or complex searches, especially useful to keep you from scrolling through long lists. An administrator-level account can place lists on user views (Views page) where the top lists that users should see are readily available, such as power, load, etc.

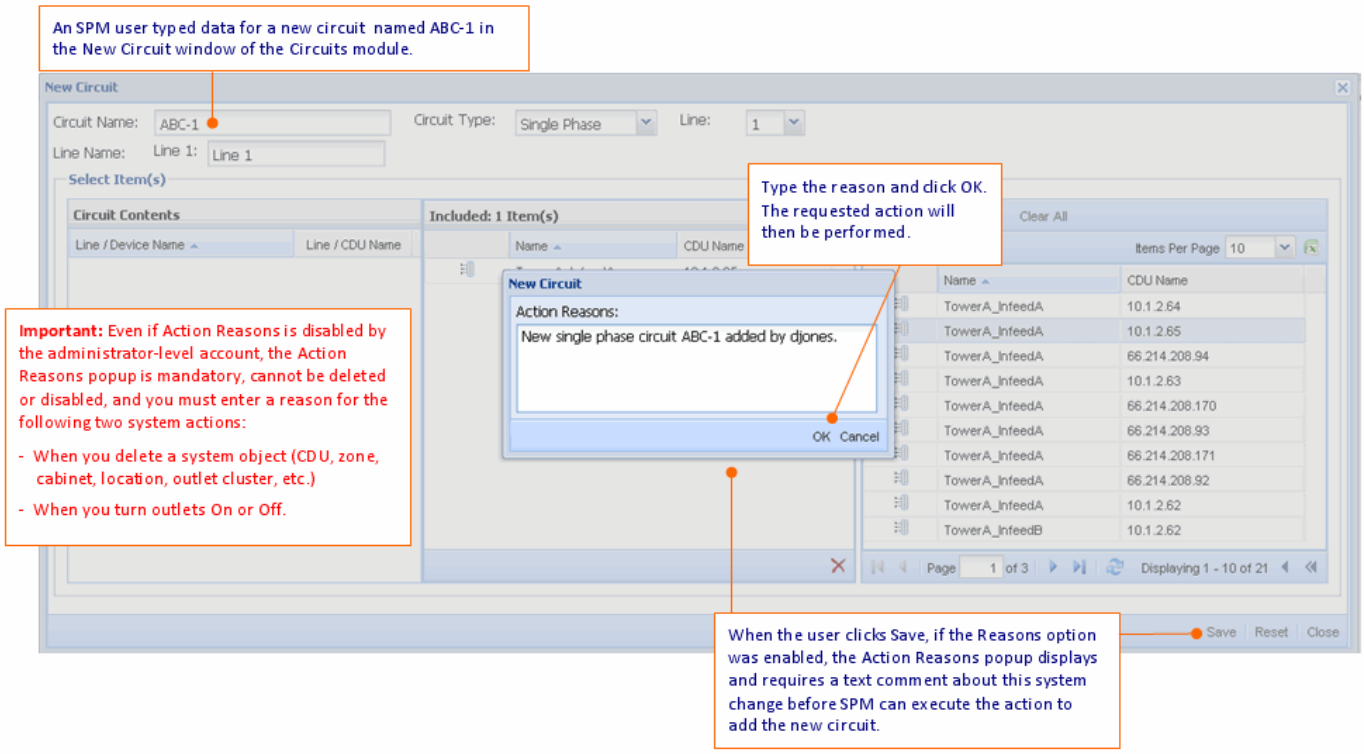


In the lower left corner of the SPM lists, you can use the Paging functions and the Refresh button to locate records fast in a lengthy data set.

Action Reasons

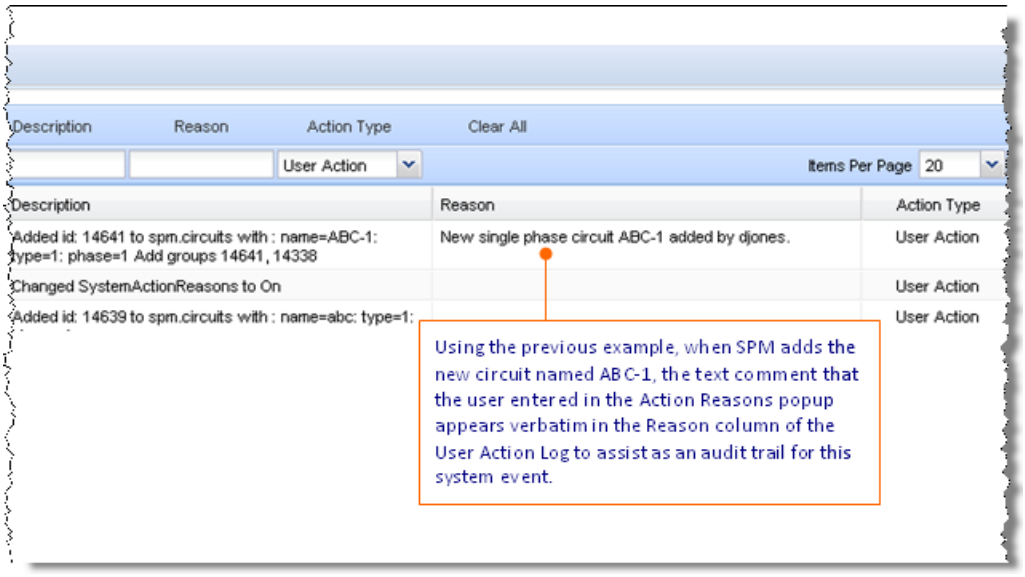
The Action Reasons feature is an SPM system-wide option that requires a text comment (a reason) about changes made to SPM. Action Reasons appear in the system logs as an audit trail to describe why system actions occurred.

How the Action Reasons feature works



Action Reasons – as an audit trail

If enabled, the text you type in Action Reasons displays on the User Action Log as follows:

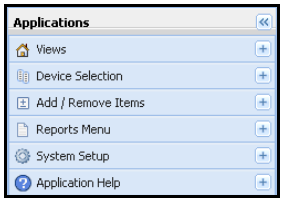


Chapter 3: Getting Started with SPM

This chapter guides you through the SPM interface to accomplish frequent device management tasks.

Quick Task Reference

To get started with SPM, click an SPM **application** (Views, Device Selection, Add / Remove Items, Reports Menu, System Setup, or Application Help) listed in the left navigation pane of the SPM interface:



Quick Reference

To do this task…	…go to this path from the applications in the SPM left navigation pane:
Access Active Alarms	Reports Menu > Active Alarms.
Access Cabinets	Device Selection > Cabinets or (Add / Remove Items > Cabinets).
Access CDUs	Device Selection > CDUs or (Add / Remove Items > CDUs).
Access Circuits	Device Selection > Circuits or (Add / Remove Items > Circuits).
Access Lines	Device Selection > Lines or (Add / Remove Items > Lines).
Access Locations	Device Selection > Locations or (Add / Remove Items > Locations).
Access Outlet Clusters	Device Selection > Outlet Clusters or (Add / Remove Items > Outlet Clusters)
Access Outlet Groups	Device Selection > Outlet Groups or (Add / Remove Items > Outlet Groups).
Access Zones	Device Selection > Zones or (Add / Remove Items > Zone).
Add a License	System Setup > Add License > enter license key provided by Server Technology
Assign User Capabilities	System Setup > Manage Users > [configure existing user or create new user].
Create an Administrative Account	System Setup > Manage Users (create new username, select Administrators option).
Configure the SPM System	System Setup > Configuration tab (Settings), Network tab, and Email Notification tab.
Configure Email Notifications	System Setup > Email Notification (Email Server, Notification Categories, and Recipients).
Contact Technical Support	Application Help > Technical Support.
Control Outlet Power	Device Selection > CDUs > Outlets tab > Outlet Control tab > select a control action.
Customize Views and Workspace	Views (select existing View from the list or create a new View).
Discover Network Devices	Add / Remove Items > Device Discovery.
Enable/Disable Action Reasons	System Setup > Configuration tab > Settings section > Action Reasons drop-down On or Off.
Generate User Reports	Reports Menu > Reports (select existing report from Reports list or create a new user report).
Generate Trend Graphs	Reports Menu > Trends (select existing trend graph in Trends list or create new trend graph).
Generate a System Log	Reports Menu > Logs (Discovery, User Action, or User Login from Action Type drop-down).
Grant Device Permissions to Users	System Setup > Manage Users > User Groups tab > right-click a user group > Configure User Group Permission > select Location, Cabinet, CDU, Outlet, or Outlet Cluster > check (or uncheck) Access checkbox for each object/device.
Manage Users	System Setup > Manage Users > Users tab.
Manage User Groups	System Setup > Manage Users > User Groups tab.
Schedule System Tasks	Add / Remove Items > Schedule Tasks.
Set LDAP Configuration	System Setup > Manage Users (select LDAP Settings tab).
Set Up SPM System	Access Hyper***fast*** Instructions: Application Help > On-Line Help System > "Hyperfast Setup and Connection" topic (instructions for regular setup and redundant setup).
View Alarm History	Reports Menu > Alarm History.
View SPM Online Help System	Application Help > On-Line Help System.
View Current SPM Version	Application Help > About SPM.

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**.

What are the SPM User Capabilities?

User capabilities are the predefined levels of access rights to the device-related operational functions of SPM as granted by the administrator to individual users in named user groups.

SPM recognizes the following user types and capabilities:

SPM User Types

Type	Capability
Administrator	Full access for all configuration, control (On, Off, Reboot), status, and serial/pass-thru ports. The SPM default administrative user is the **admn** username (password is also **admn**). Note there is no "I" in the **admn** username/password. The **admn** user can grant full administrative access rights to other users. **NOTE:** For security, Server Technology recommends that you first use the **admn** user account to grant capabilities to another administrative user account. Then use the new account to change the default **admn** username and password. The **admn** account cannot be deleted or demoted.
On	Allows user access to turn on an outlet. A user assigned access to an outlet (that is currently turned off) can turn the outlet back on again with the On capability but cannot turn the outlet off.
Regular	Partial access to control (On, Off, Reboot), status, and pass-thru of assigned outlets, outlet groups, outlet clusters, and serial/pass-thru ports.
Reboot	Partial access for control (Reboot), status, and pass-thru of assigned outlets, outlet groups, outlet clusters, and serial/pass-thru ports.
View Only	Partial access for status & pass-thru of assigned outlets, outlet groups, outlet clusters, & serial/pass-thru ports.

Use the Default Admn Account to Create a New Administrative Account

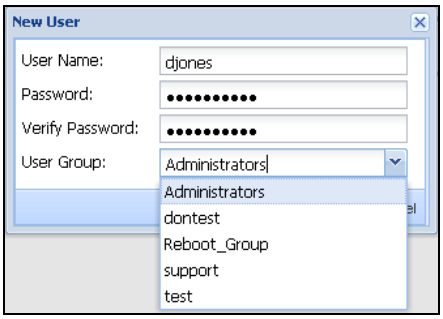
NOTE: Before you begin, remember that the default **admn** account cannot be deleted and its capabilities cannot be demoted from the administrative level. Also, there is no "i" in **admn**.

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.

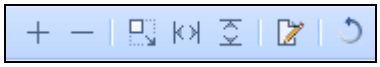
Building Your Graphical Data Center

The Locations module 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 sublocations, cabinets, and CDUs. Location images represent the customized levels of your data center, such as buildings, floors, and rooms.

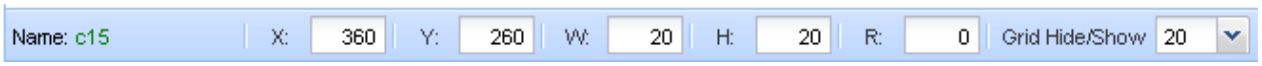
Go to Device Selection > Locations to display the Locations list.

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:

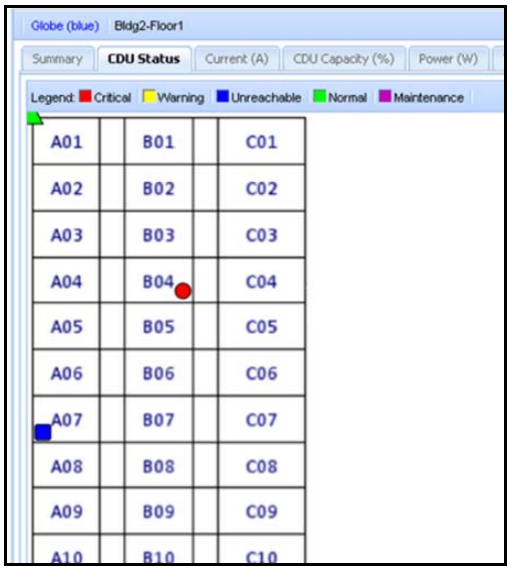


Click the Arrange Icons icon. The graphic redisplays in a grid and the location edit panel displays at the bottom showing the device name in the far left Name field, a cabinet "c15" in this example:



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 this example based on the legend shown, the cabinet is normal (**green**), the location is critical (**red**), and the CDU is unreachable (**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.

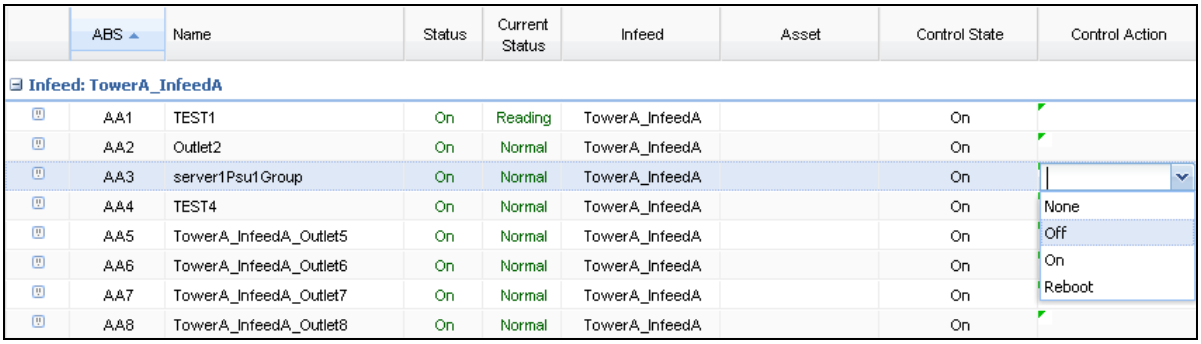
Outlet Control Actions

The following CDU outlet control actions are available in SPM:

- **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

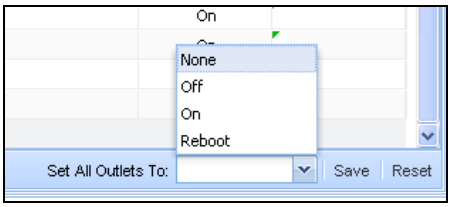
1. Select **Device Selection** > **CDUs** to display the CDUs list.
2. Select a CDU from the list.
3. Select the **Outlets** > **Outlet Control** tab. The Outlets page displays the available outlets for the CDU by infeed towers.



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:

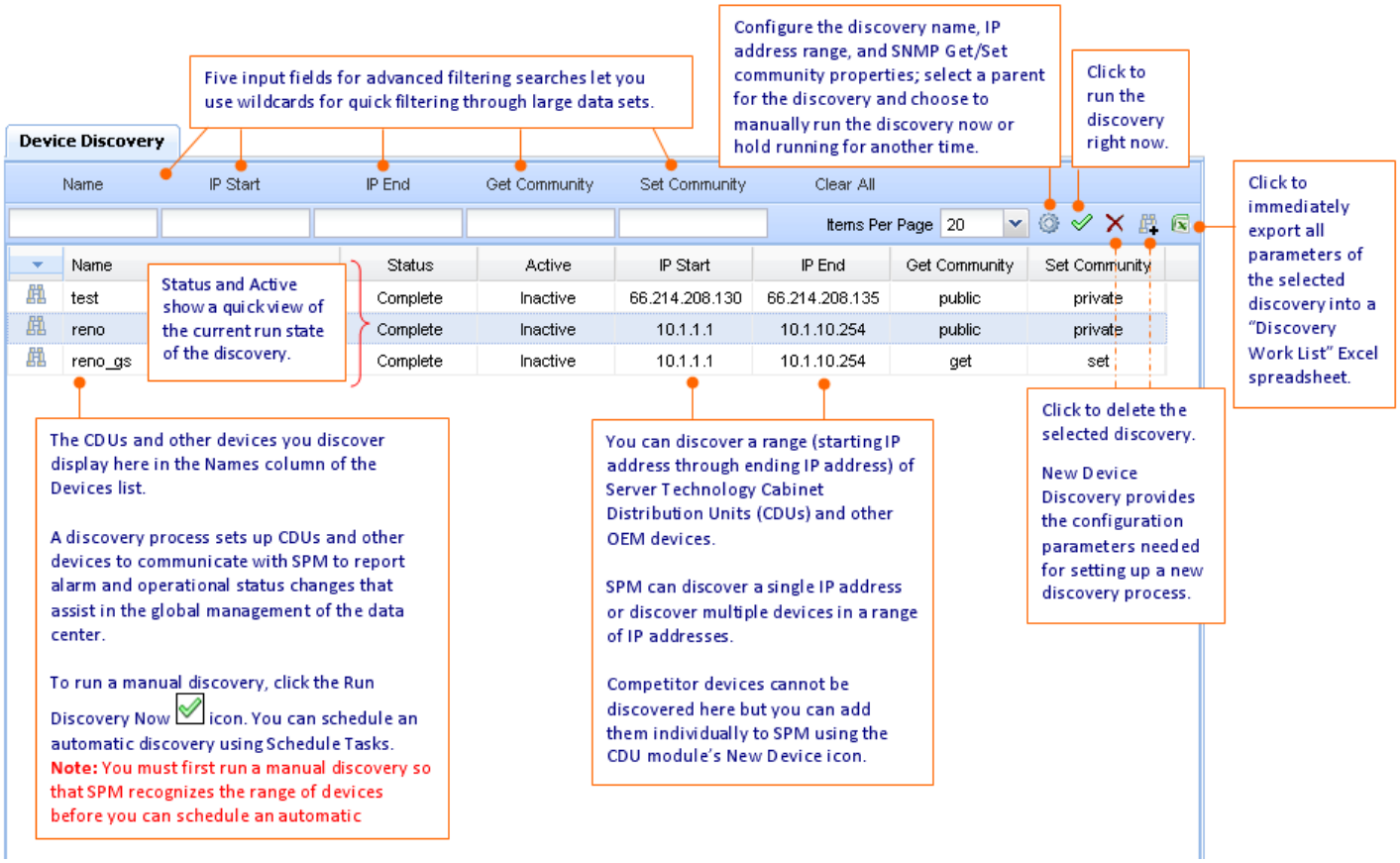


5. Select an outlet action command: None, Off, On, or Reboot to issue the command on all outlets.
6. Click **Save**. The Control State changes to show the effect on all outlets from the last issued command.

Discovering Network Devices

The Device Discovery module 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.

Select **Add / Remove Items > Device Discovery** to display the Device Discovery list. The following graphic shows the list and illustrates the Device Discovery functions.



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).

NOTE: You must first run a manual discovery for SPM to recognize a new range of devices before you can schedule an automatic discovery

Running an Automatic Device Discovery

You can schedule an automatic device discovery using the Schedule Tasks feature. A device discovery is one of several system events that SPM can schedule according to the discovery parameters you determine in Schedule Tasks.

For more information, see Scheduling an Automatic Device Discovery in the Schedule Tasks section of this guide.

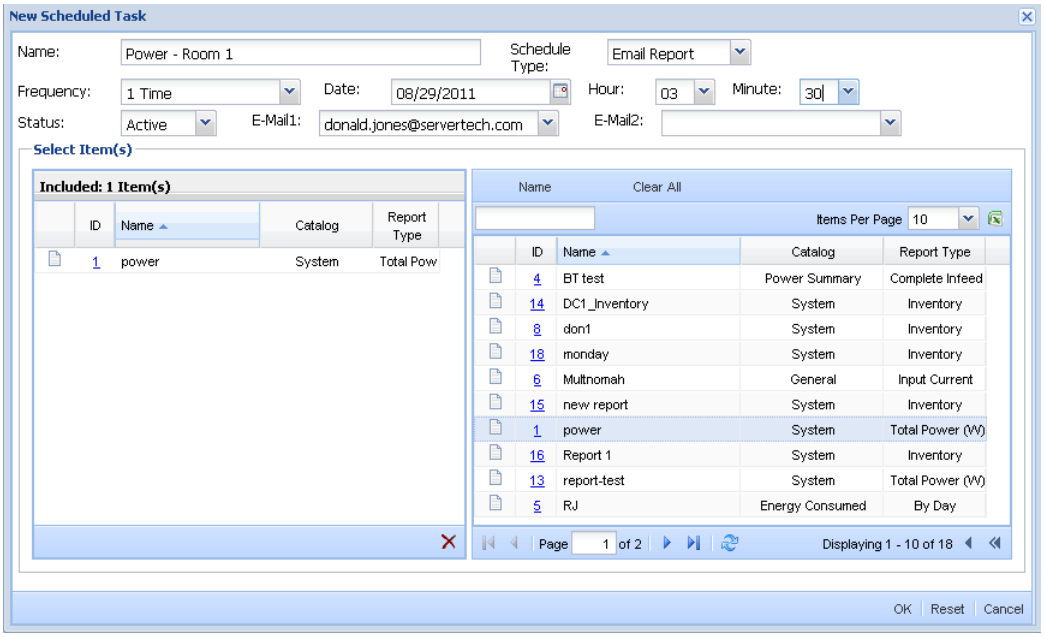
Emailing User Reports and Trend Graphs

SPM allows you to schedule system events that can be automatically run at a future date or on a recurring basis. This functionality includes the generation of user reports and trend graphs and allows for these items to be automatically emailed to a defined list of recipients. You can also bypass the scheduled task process and simply email a user report and trend graph as an attachment to an email.

Email a User Report (as a Scheduled Task)

NOTE: Before you can email a report, you must first create the report at **Reports Menu > Reports > Reports List > New User Report.**

1. Go to **Add / Remove Items > Schedule Tasks >** New Scheduled Task icon:

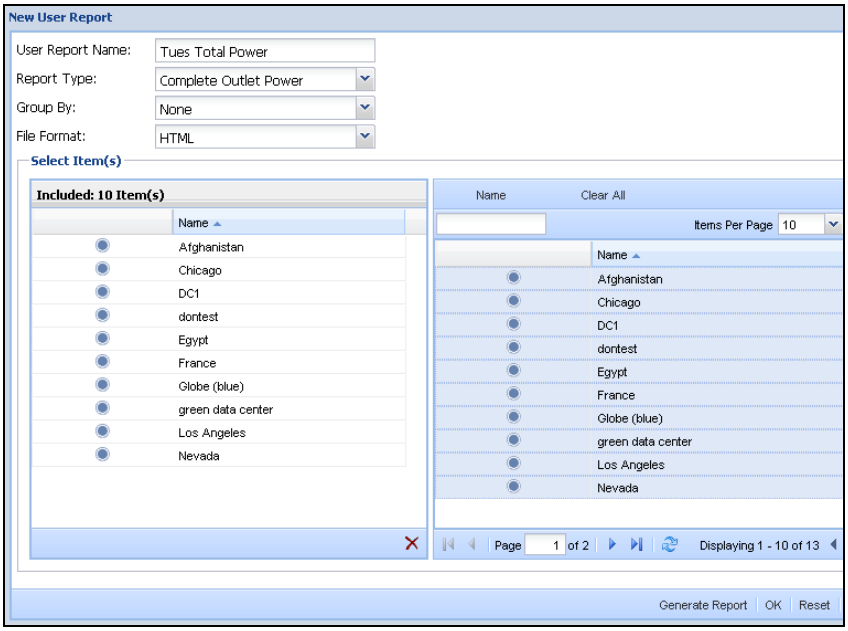


2. Provide a new name for the scheduled task (this is the name for the task that will email the report).
3. From the Scheduled Type drop-down list, select the Email Report option.
4. Provide the frequency, date, time, and status options.
5. From the Email field, select an existing email recipient from the drop-down list, or type a new email address.
6. The list of existing reports on the right comes directly from the Reports list at Reports Menu > Reports > Reports List. You must first create a new user report before you can email it, or the list will not show the report you want. From the list of existing reports on the right, drag and drop the report you want to the Included section on the left. Once in the Included section, the report is targeted to be scheduled for emailing.
7. Click **OK**. The new scheduled task will automatically email the report to the specified email recipient at the designated frequency, date, and time.

Email a User Report (not as a Scheduled Task)

NOTE: Before you can email a report, you must first create the report at **Reports Menu > Reports > Reports List > New User Report.**

1. Specify the parameters for a new user report in the New User Report window (shown below) or the Configure User Report window (for an existing user report in the Reports list), and then click the **Generate Report** button to create the report.



2. After clicking **Generate Report**, your web browser displays a box (the format of the box varies slightly depending on the browser) with choices to view the report or to save the report file. (Alternately, you can select an existing report in the Reports list and then click the Export User Report icon to display the same browser box with choices to view or save the report.)

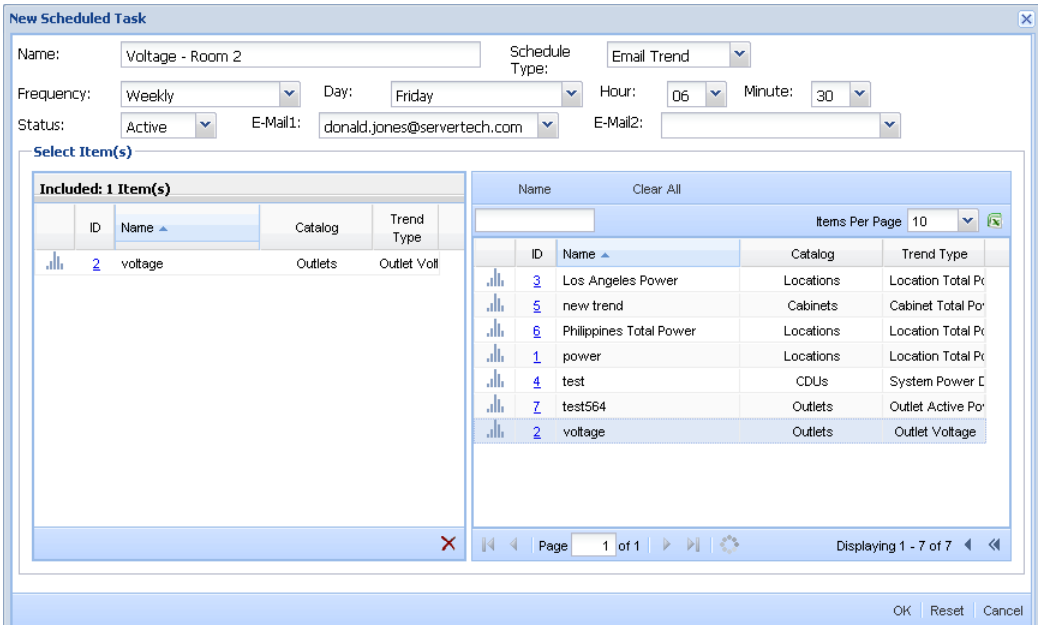
3. To email the report, select the Save option. The report file will be saved to the location where your browser has been configured to save downloads.

4. Once you have saved the report, locate it in your web-based downloads location, and then simply attach the report file to an email.

Email a Trend Graph (as a Scheduled Task)

NOTE: Before you can email a trend graph, you must first create the trend at **Reports Menu > Trends > Trends List > New Trend.**

1. Go to **Add / Remove Items > Schedule Tasks >** New Scheduled Task icon:

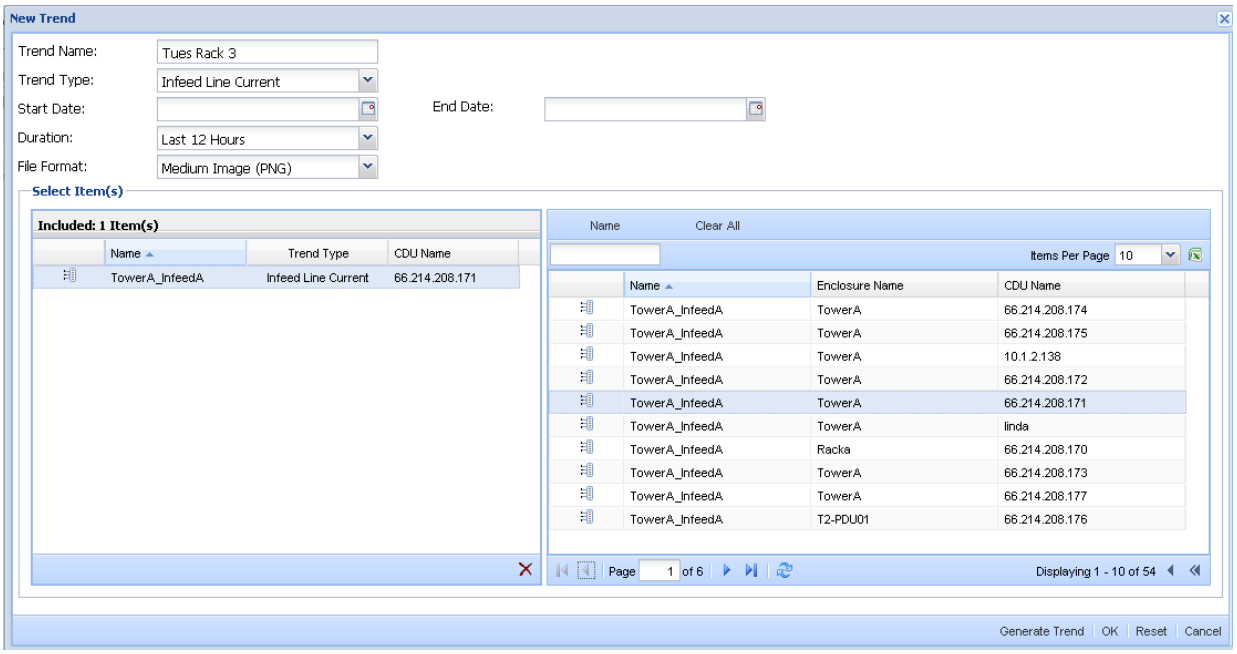


2. Provide a new name for the scheduled task (this is the name for the task that will email the trend graph).
3. From the Scheduled Type drop-down list, select the Email Trend option.
4. Provide the frequency, date, time, and status options.
5. From the Email field, select an existing email recipient from the drop-down list, or type a new email address.
6. The list of existing trend graphs on the right comes directly from the Trends list at Reports Menu > Trends > Trends List. You must first create a new trend graph before you can email it, or the list will not show the trend you want. From the list of existing trends on the right, drag and drop the trend you want to the Included section on the left. Once in the Included section, the trend is targeted to be scheduled for emailing.
7. Click **OK**. The new scheduled task will automatically email the trend graph to the specified email recipient at the designated frequency, date, and time.

Email a Trend Graph (not as a Scheduled Task)

NOTE: Before you can email a trend graph, you must first create the trend at **Reports Menu > Trends > Trends List > New Trend.**

1. Specify the parameters for a new trend graph in the New Trend window (shown below) or the Configure Trend window (for an existing trend in the Trends list), and then click the **Generate Trend** button to create the trend graph.



2. After clicking **Generate Report**, your web browser displays a box (the format of the box varies slightly depending on the browser) with choices to view the trend graph or to save the trend file. (Alternately, you can select an existing trend graph in the Trends list and then click the Export Trend icon to display the same browser box with choices to view or save the trend graph.)

3. To email the trend graph, select the Save option. The trend file will be saved to the location where your browser has been configured to save downloads.

4. Once you have saved the trend graph, locate it in your web-based downloads location, and then simply attach the trend file to an email.

Exporting User Reports, Trend Graphs, and Data Sets (Lists)

SPM allows the following export functions for user reports, trend graphs, and data displayed in the entire Reports List and Trends List.

Export User Reports Go to **Reports Menu > Reports >** to display the Reports List			
Click this icon…	**for this function…**	**to display this box…**	**and the end result is…**
(or right-click a report in the Reports List)	Export User Report	"view or save" option box **	The single user report you selected.
	Export Raw Data to Excel	"view or save" option box **	Entire Reports List in Excel format.

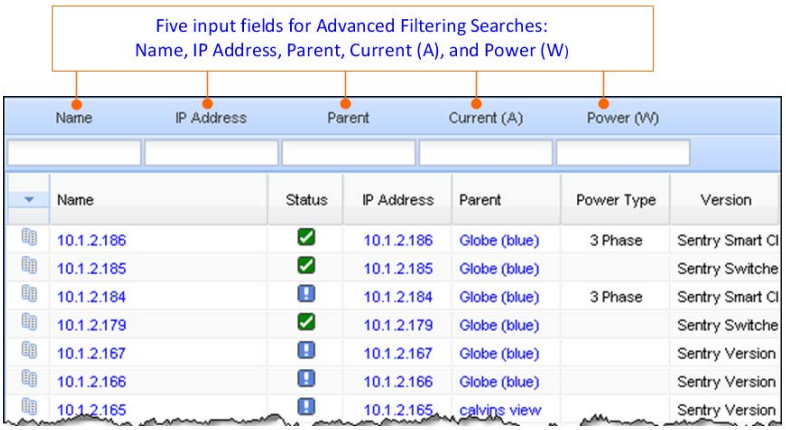
****** The "view or save" option box varies slightly in appearance depending on your web browser. The option box gives the choices to open the report and view it online or to save the report file. If you select save, the report file will be saved to the location where your browser has been configured to save downloads.

Export Trend Graphs Go to **Reports Menu > Trends >** to display the Trends List			
Click this icon…	**for this function…**	**to display this box…**	**and the end result is…**
(or right-click a trend in the Trends List)	Export Trend	"view or save" option box **	The single trend graph you selected.
	Export Raw Data to Excel	"view or save" option box **	Entire Trends List in Excel format.

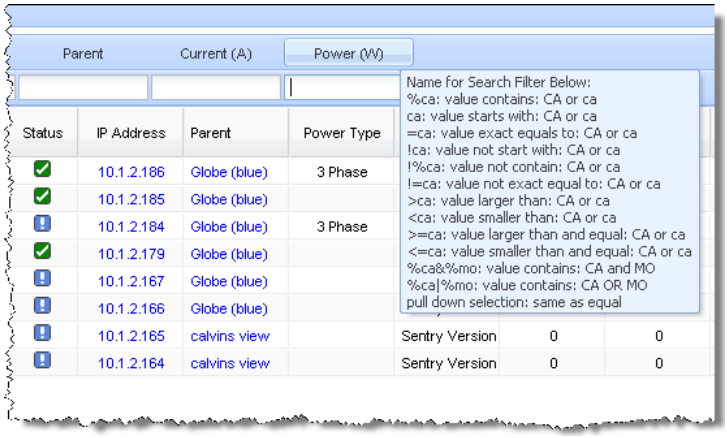
****** The "view or save" option box varies slightly in appearance depending on your web browser. The option box gives the choices to open the trend graph and view it online or to save the trend file. If you select save, the trend file will be saved to the location where your browser has been configured to save downloads.

Searching Data Sets Using Advanced Filters

The Advanced Filtering Search tool provides a fast and highly flexible search for devices in large data sets. The five input fields you use to activate the search display at the top of SPM data sets, like the CDU data set in the following example:



Hover the mouse over an input field *heading* (not the input field) for a popup showing several lines of unique wildcard character sets that you can use for advanced filter searching:



The wildcard character sets support advanced searching techniques, such as text comparison, numerical comparison, "like" functionality, and the ability to create compound statements.

A closer view of the character sets shows a combination of special wildcard characters and the search description that SPM supports:

Name for Search Filter Below:
%ca: value contains: CA or ca
ca: value starts with: CA or ca
=ca: value exact equals to: CA or ca
!ca: value not start with: CA or ca
!%ca: value not contain: CA or ca
!=ca: value not exact equal to: CA or ca
>ca: value larger than: CA or ca
<ca: value smaller than: CA or ca
>=ca: value larger than and equal: CA or ca
<=ca: value smaller than and equal: CA or ca
%ca&%mo: value contains: CA and MO
%ca|%mo: value contains: CA OR MO
pull down selection: same as equal

Chapter 4: Creating Custom Views

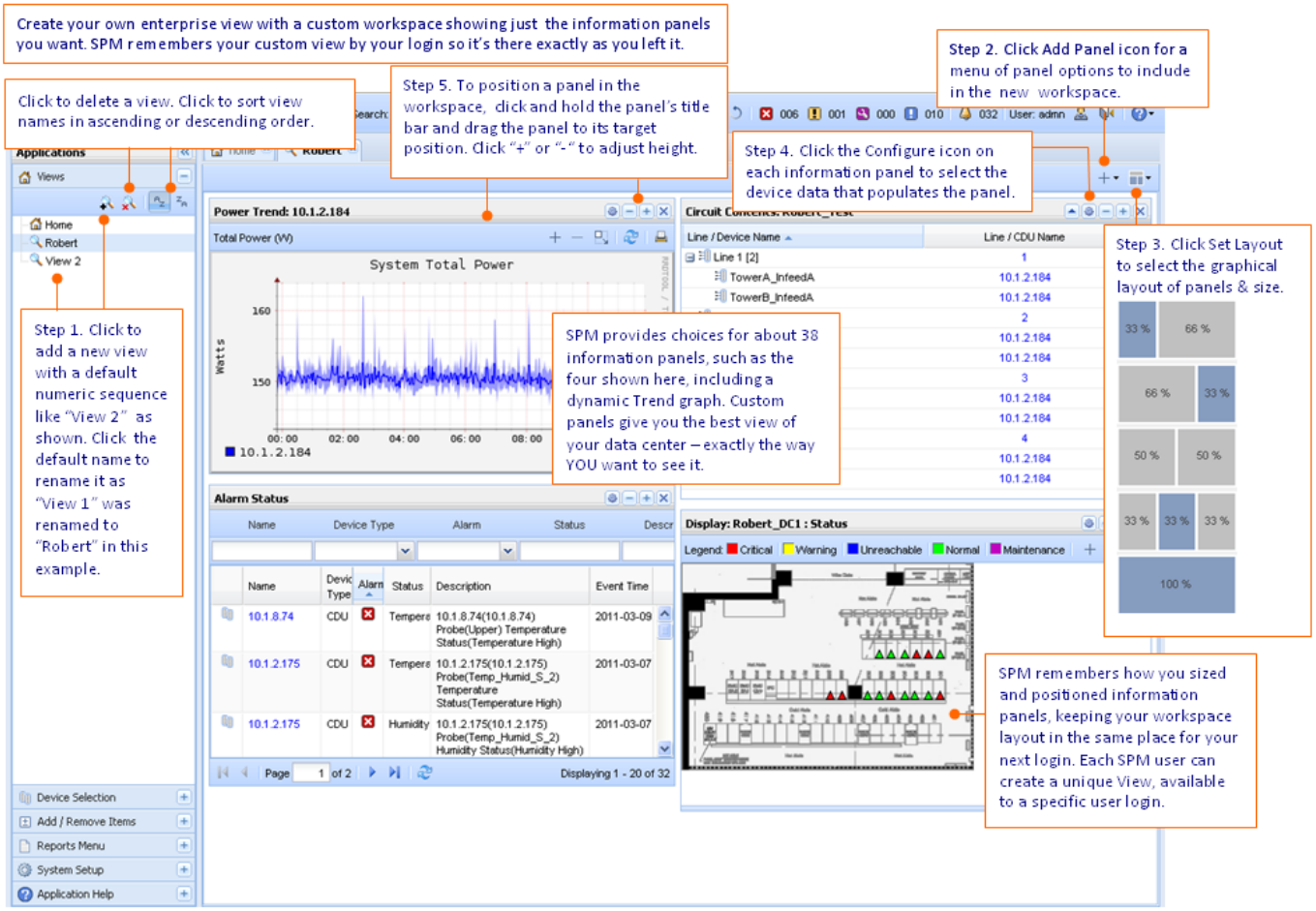
This chapter introduces SPM Views and shows how to customize the layout of your workspace with system information panels that let you monitor and manage CDUs.

The Views Page

SPM lets you customize your workspace layout and the type of device data you see, in addition to other areas to you can modify for personal preferences.

The Views application is the gateway to SPM, providing at-a-glance monitoring and management of your enterprise. The Home View is the starting point of SPM, with a default workspace where you create your own custom views.

Step-by-Step: Customize Your Workspace

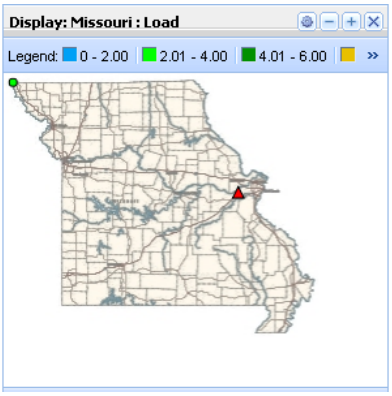


The Home View

The Home View is the starting point of SPM, providing a default workspace on the Views page on which to add application panels, trend reports, and other system resources, and to which you can return by simply clicking **Views > Home**.

The Views application is the gateway to SPM, providing at-a-glance monitoring and management of your enterprise. Views lets you customize the SPM modules you want to work with and remembers your preferences by login, such as how you placed and sized panels in the Views workspace. Multiple SPM users can each have their own customized Views.

The Views in SPM provide the building blocks for your custom graphical data center view. The administrator builds a data center with specific locations and select icons to represent the location background, cabinets, and devices. The graphical layout gives you fast visual control with the ability to drill down from a global enterprise view to a detailed rack level view.



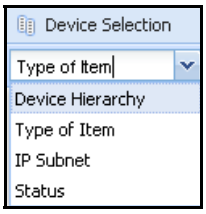
For example, the following shows a graphical view of the location Missouri in **green** (Normal) status and the cabinet in **red** (Critical) status.

Chapter 5: Working with Devices

This chapter presents the Device Selection, Add/Remove Items, Device Discovery, and Schedule Task applications for working with networked devices.

Device Selection

The Device Selection application displays a list of discovered network devices. You select a device to access operational details for monitoring and managing the device. Device Selection allows you to customize how the device list displays:



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

Type of Item: Displays the list by device type like cabinet, CDU, circuit, lines.

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

Status: Shows IP addresses within the Critical, Maintenance, Unreachable, and Warning statuses.

Cabinets

The Cabinets module 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 graphs for the cabinet.

CDUs

The Cabinet Distribution Unit (CDU) module 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.

NOTE: Thresholds for temperature and humidity can be set globally at one time for all sensors.

Circuits

The Circuits module lets you plan, track, and manage the physical infrastructure of power systems feeding one or multiple CDUs.

The Circuits module provides a summarized view of the defined circuit layout in your data center, and SPM considers a circuit to be a full power line to the data center, either single phase or 3-phase, as you define the circuit.

If you define the circuit as single phase

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

If you define the circuit as 3-phase

The Circuits module analyzes the balance of power in a 3-phase system. 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.

How the circuit module works

A circuit tracks lines of power across multiple devices, therefore, the Circuits module reports aggregate total power and load values across multiple power sources. All load and power readings for the devices on lines and circuits are totaled, and the balance of power in a 3-phase system is analyzed.

You can see this effect reported in trending over time in the Trend graphs which assists in assigning thresholds for real-time warnings. You can use circuit trending for aggregated power to analyze the power usage of lines of power over time to monitor the results of devices turning on and off at specific times of the day.

Lines

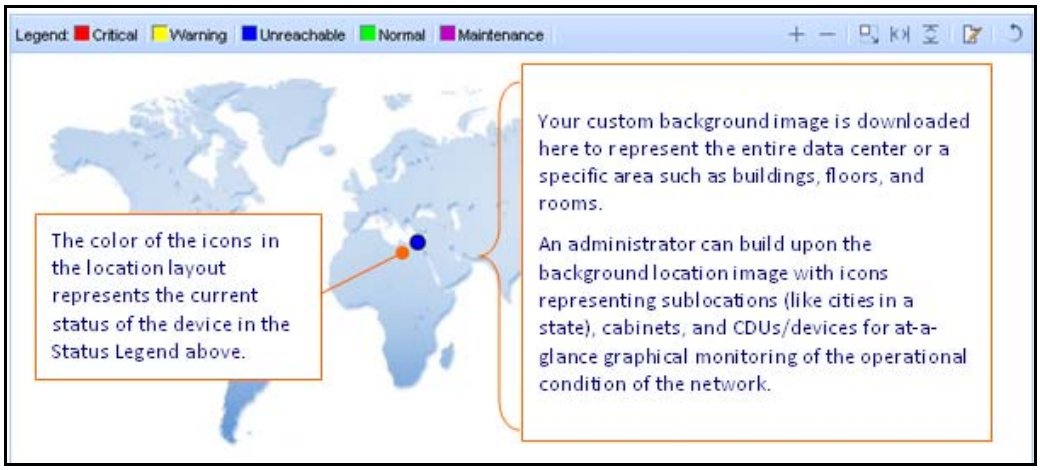
The Lines module shows detailed data for power lines in circuits. Line data assists in providing instant feedback for the state of the full circuit, allowing high/low thresholds to be set for power and load.

NOTE: Because lines are components of circuits, lines cannot be created individually in the Lines module. You must create individual lines in the Circuits module

Locations

The Locations module gives you the tools necessary for the review and management of networked devices. A location as a graphical image – such as a state map or a room layout – is the background on the Views page upon which the administrator builds a graphical representation of the data center and then uses icon types for sublocations, cabinets, and CDUs.

Location (and sublocation) images show the customized levels of your data center as configured with buildings, floors, rooms, and more.



Outlet Clusters

The Outlet Clusters module lets you select various CDU power outlets (as part of an outlet group) and then place the outlets into a collection of named “outlet clusters” for convenient and fast administration of outlet control On, Off, and Reboot actions.

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 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

The Outlet Groups module allows you to select various CDU power outlets and then place the outlets into a collection of “outlet groups” for convenient and fast administration of outlet control On, Off, and Reboot actions.

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.

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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.

Zones

The Zones module gives you an additional way to virtually group CDUs or cabinets for viewing and trending, regardless of their physical locations.

Only CDUs and cabinets can be grouped into a zone – you cannot group locations, circuits, lines, outlet groups, or outlet clusters into a 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.

Add/Remove Items

The Add/Remove Items application lists devices and device-related system objects for quick access, such as outlet clusters and outlet groups. In addition, Add/Remove Items provides access to the Device Discovery and Schedule Tasks features.

Cabinets

The Cabinets module 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 graphs for the cabinet.

CDUs

The Cabinet Distribution Unit (CDU) module 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.

NOTE: Thresholds for temperature and humidity can be set for all sensors globally at one time.

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The Circuits module lets you plan, track, and manage the physical infrastructure of power systems feeding one or multiple CDUs.

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

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The Circuits module analyzes the balance of power in a 3-phase system. 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.

How the circuit module works

A circuit tracks lines of power across multiple devices, therefore, the Circuits module reports aggregate total power and load values across multiple power sources. All load and power readings for the devices on lines and circuits are totaled, and the balance of power in a 3-phase system is analyzed.

You can see this effect reported in trending over time in the Trend graphs which assists in assigning thresholds for real-time warnings. You can use circuit trending for aggregated power to analyze the power usage of lines of power over time to monitor the results of devices turning on and off at specific times of the day.

Device Discovery

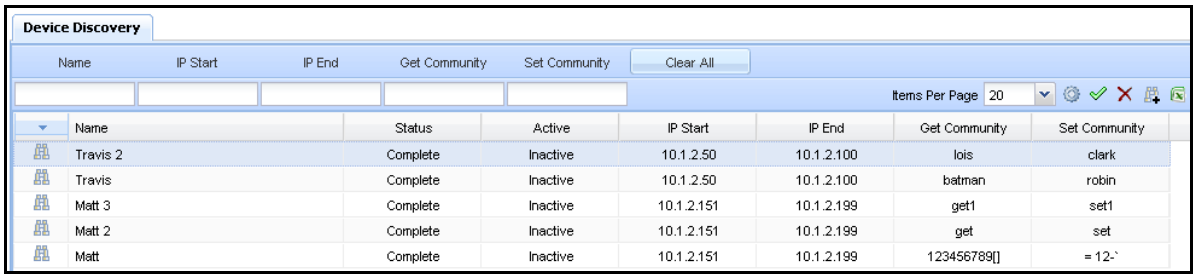
The Device Discovery module lets you define the parameters for a manual discovery of CDUs in your network. Discovery can be used for the initial network discovery when SPM is installed and then later as needed for new devices added to the network.

A discovery process sets up CDUs and other devices to communicate with SPM to report alarm and operations status changes that assist in the global management of the data center.

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).

The device discovery tab

Shows a list of the created device discoveries and their parameters.

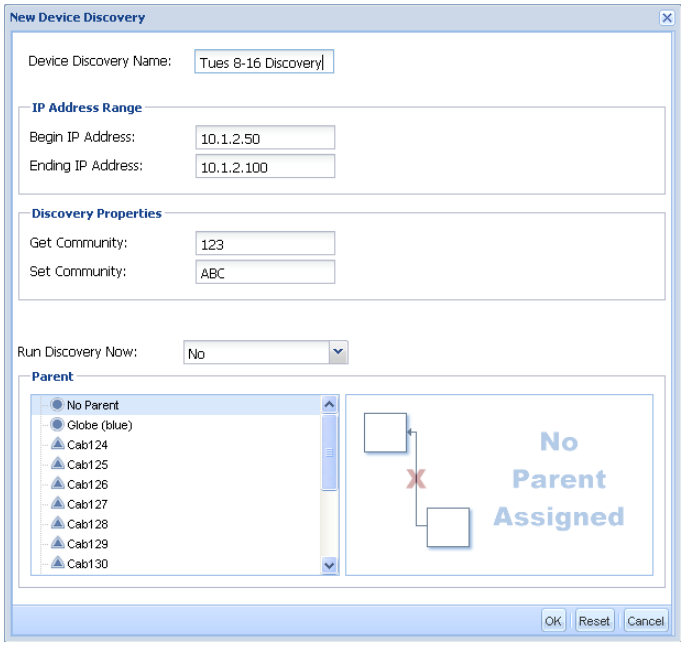


Name	Status	Active	IP Start	IP End	Get Community	Set Community
Travis 2	Complete	Inactive	10.1.2.50	10.1.2.100	lois	clark
Travis	Complete	Inactive	10.1.2.50	10.1.2.100	batman	robin
Matt 3	Complete	Inactive	10.1.2.151	10.1.2.199	get1	set1
Matt 2	Complete	Inactive	10.1.2.151	10.1.2.199	get	set
Matt	Complete	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 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).

NOTE: You must first run a manual discovery for SPM to recognize a new range of devices before you can schedule an automatic discovery.

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 module.

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.

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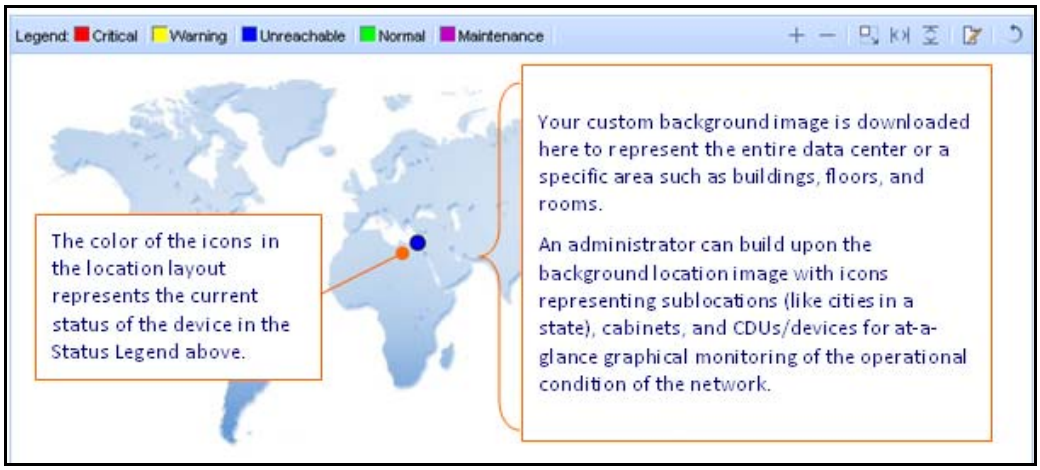

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The outlet control tab (outlet groups)

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.

Schedule Tasks

The Schedule Tasks module allows you to define and schedule the frequency of SPM system events that can be automatically run at a specific future date, or run on a recurring basis.

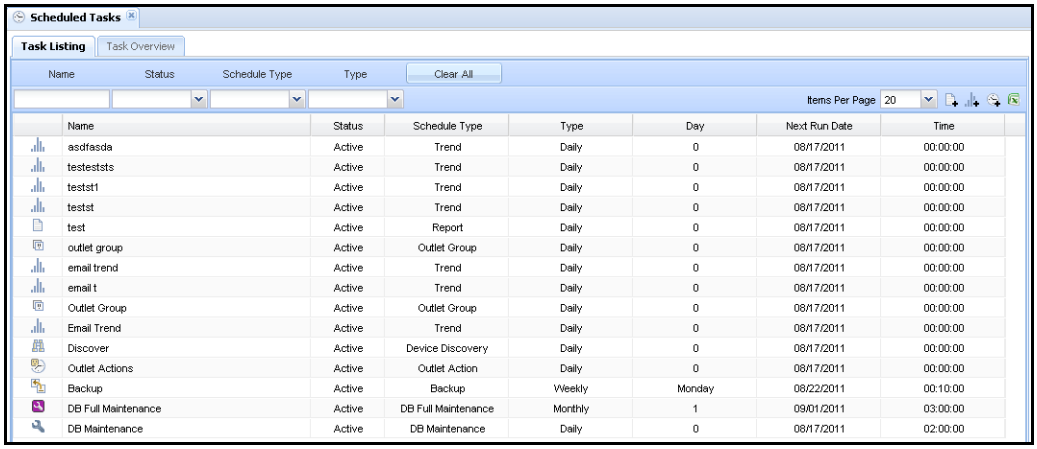
For example, a scheduled task can be an SPM configuration that automatically commands individual outlets (or groups of outlets) to turn on, turn off, or reboot at the same time each week.

Which tasks can be scheduled?

SPM allows the following system events to be scheduled: outlet actions, device discovery, email report, email trend, backup, outlet group, outlet cluster, database maintenance (basic and faster), and database full maintenance (advanced and longer running).

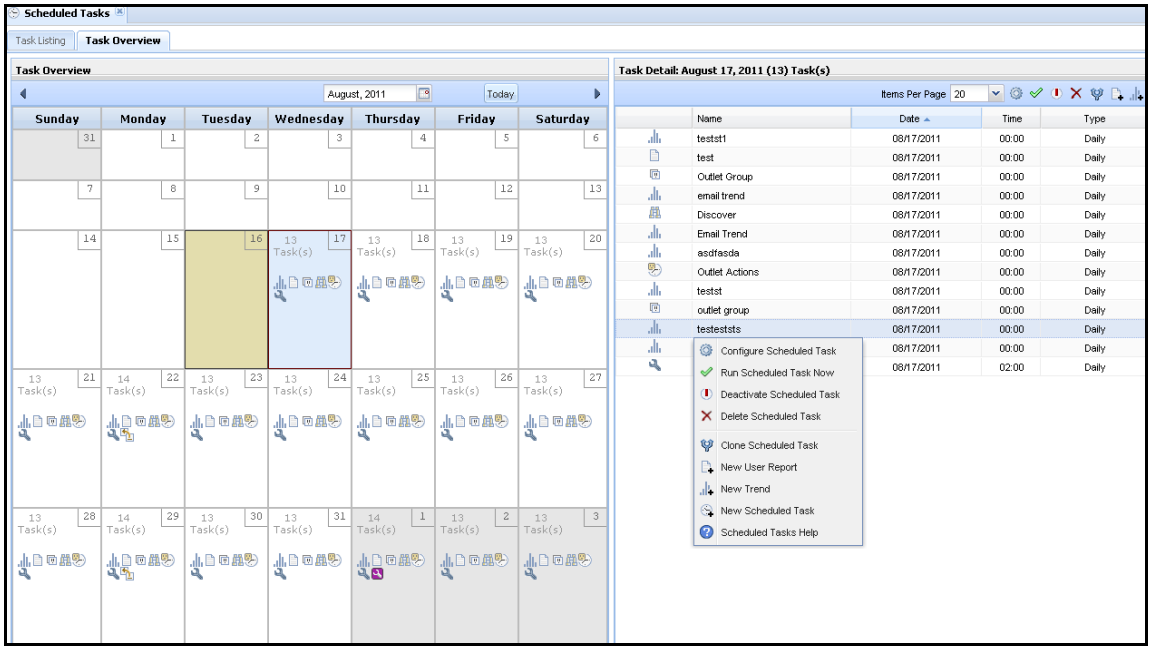
The task listing tab

Shows all created SPM system events as scheduled tasks.



The task overview tab

Provides quick access to monthly events calendars for at-a-glance review and planning of past, current, and future scheduled tasks.



Click a day on the calendar to display a list of the task details for that day on the right side of the window. Then right-click a task in the list for schedule task menu options.

The blue shaded calendar day is the day selected for details (August 17 in this example); the gold shaded day is the current day; the gray shaded days are in the next month.

Creating a new schedule task

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.

Configuring a schedule task

Select a created schedule task in the Task Listing and click the Configure icon (or right-click the task in the list and select the Configure Scheduled Task option). The Configure Scheduled Task window opens to allow editing of the parameters for the selected task.

Cloning a task schedule

You can save time when creating a new task by cloning some or all of the parameters from an existing task. SPM allows the cloning of outlet actions, device discovery, email report, email trend, backup, outlet group, outlet cluster, database maintenance (basic and faster), and database full maintenance (advanced and longer running).

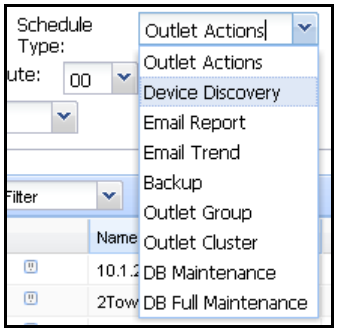
By selecting an existing task schedule, and then clicking the Clone icon (or right-clicking the selected task and selecting the Clone Scheduled Task option), the Clone Scheduled Task window displays with the parameters configured for the selected task. The parameters displayed depend on the system event you are cloning. You then name the new (cloned) task, and either accept the same parameters from the previous task or edit the parameters as desired for your new cloned task.

Clone Example: When you schedule On/Off for outlet, outlet groups, or outlet clusters, the clone option lets you create a second schedule to create an exact copy of the original schedule. You just need to provide a new schedule task name and then you can change the parameters for frequency, hour, and minute as desired.

If 50 outlets are scheduled to be turned Off Friday PM, clone that schedule task and edit the clone to Monday AM to turn the outlets back on.

NOTE: Once you create a cloned task, the clone does not automatically sync to the original schedule you based the clone on. You will need to update both the original schedule and the cloned schedule.

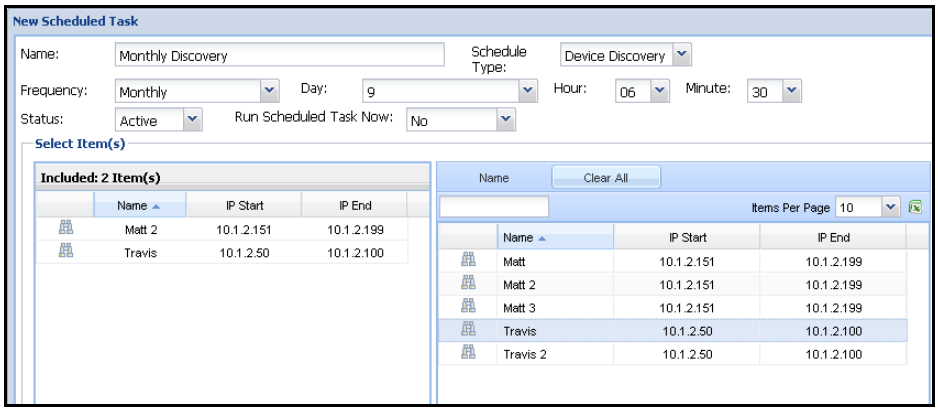
Scheduling an automatic device discovery



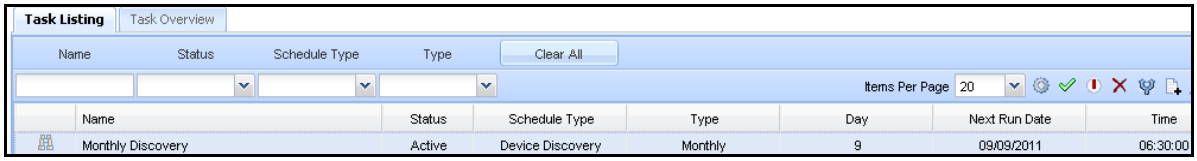
A device discovery process sets up CDUs and other devices to communicate with SPM to report alarm and operations status changes that assist in the global management of the data center. One of the schedule tasks you can automate is a device discovery.

From the New Scheduled Task window, select Device Discovery from the Schedule Type drop-down list.

The New Scheduled Task window displays where you name the device discovery, configure run parameters, and select the IP addresses of the devices to be included in the discovery.



The schedule discovery then displays in the Task Listing



Active, inactive, deactivate, and delete

The Active option in the Status field of the Scheduled Task window makes the schedule task active to run as currently scheduled.

The Deactivate icon deactivates the scheduled task until you make the task active again. Same as the Inactive option in the Status field of the Scheduled task window.

The Delete icon permanently deletes a selected task from the Task Listing and from SPM.

Server Time vs. Logged-In Time

When configuring scheduled tasks, note the server's time shown in the lower right corner of the Schedule Tasks window:

The Scheduled Tasks feature runs using the server's time, which may differ from your logged in time

Refer to your time zone setup in the SPM Network Time Protocol (NTP) settings at System Setup > Settings.

Zones

The Zones module gives you an additional way to virtually group CDUs or cabinets for viewing and trending, regardless of their physical locations.

Only CDUs and cabinets can be grouped into a zone – you cannot group locations, circuits, lines, outlet groups, or outlet clusters into a 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.

Chapter 6: Generating Reports, Trend Graphs, and System Logs

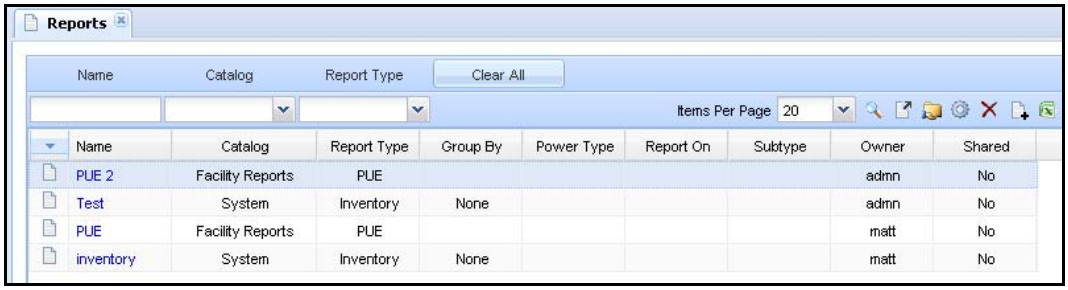
This chapter discusses the customized reports, trend graphs, system logs, active alarm information, and alarm history available in SPM.

Reports

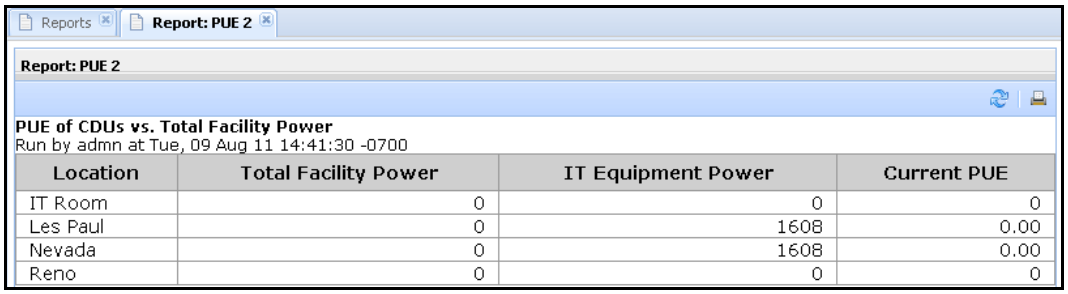
The Reports module allows you to customize a new report by choosing from many available report types, naming your report, and selecting the system objects that you want included in the report.

The Reports Tab

Shows a list of the created custom reports and their parameters.



Clicking a report name on the list displays it, for example the "PUE 2" report:

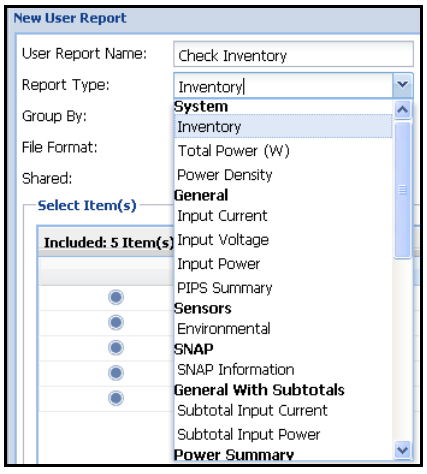


Location	Total Facility Power	IT Equipment Power	Current PUE
IT Room	0	0	0
Les Paul	0	1608	0.00
Nevada	0	1608	0.00
Reno	0	0	0

Creating a new report

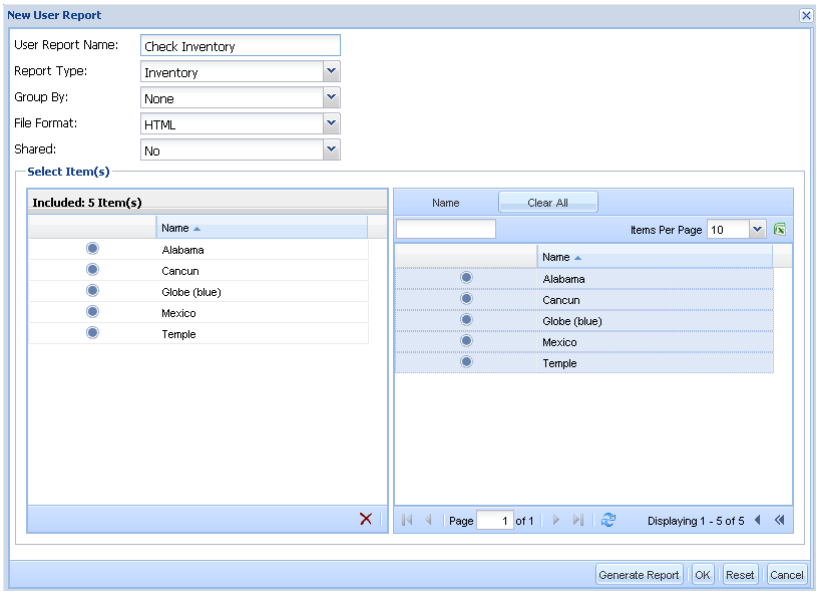
Click the New Report icon (or right-click a report in the Reports list and select New User Report option). The New User Report window opens to allow setting the parameters for the new user report.

Create a name for your new report in the User Report Name field, and then select from several report types shown in the drop-down list.



Most reports can be grouped by location, cabinet, location and cabinet, and zone. Report formats can be HTML, XML, Microsoft Word, or Microsoft Excel. A report can be shared or not-shared (available for your login only).

The New User Report window also lets you select the objects from the data list on the right and drag one or more objects to the left to be included in the report, such as the locations shown in this example:



Sample reports

This Inventory report was generated on the locations included in the above report screen.

Inventory

Run by admn at Thu, 18 Aug 11 09:30:03 -0700

CDU	Device	Enclosure	IP Address	NIC Serial Number	Firmware Version	Serial Number	Model Number	Type	Max Capacity (VA)
10.1.2.170	STI MIB version 3	TowerA	10.1.2.170	8045878	Sentry Smart CDU Version 6.1c	ACVA0000007	CSG-24VYM417A1	3 Phase	10800
10.1.2.174	STI MIB version 3	TowerA	10.1.2.174	1645604	Sentry Version 5.3q	0		Single Phase	0
10.1.2.175	STI MIB version 3	TowerA-test	10.1.2.175	8046219	Sentry Smart CDU Version 6.1c	ENG00000761	CSG-24VEK415A1	208V	0
10.1.2.181	STI MIB version 3	TowerA	10.1.2.181	8107188	Sentry Switched CDU Version 6.1b	AABD1111111	CW-8H1-C20	Single Phase	0
10.1.2.181	STI MIB version 3	TowerB	10.1.2.181	8107188	Sentry Switched CDU Version 6.1b			Single Phase	0
10.1.2.182	STI MIB version 3	TowerA	10.1.2.182	8149792	Sentry Switched CDU Version 6.1b	PCAN0001215	CW-8H1-C20M	Single Phase	0
10.1.2.184	STI MIB version 3	tr55_A	10.1.2.184	8042992	Sentry Smart CDU Version 6.1b	ACRJ0000227	CS-36V4K454-A4C/AA	3 Phase	44160
10.1.2.184	STI MIB version 3	tr55_B	10.1.2.184	8042992	Sentry Smart CDU Version 6.1b	ACRI0000227	CL-36V4K454-A4C/AA	3 Phase	44160
10.1.2.185	STI MIB version 3	185tower	10.1.2.185	8164607	Sentry Switched CDU Version 6.1b (Beta 2)(110602)	ABEX0000211	CW-24VE-C20M	Single Phase	0
10.1.2.185	STI MIB version 3	TowerB	10.1.2.185	8164607	Sentry Switched CDU Version 6.1b (Beta 2)(110602)	ABKE0000103	CX-24VE-C20M	Single Phase	0

This Total Power report was generated on the same locations above and grouped by location.

Total Power

Run by admn at Thu, 18 Aug 11 09:37:20 -0700

Location	CDU	Total Power (W)
Cancun		
	10.1.2.182	136
	10.1.2.184	221
	10.1.2.185	538
	10.1.2.186	560
	10.1.2.187	189
Globe (blue)		
	10.1.2.170	0
	10.1.2.174	0
	10.1.2.175	380
	10.1.2.181	30
	10.1.2.188	102
	10.1.2.189	71
	10.1.2.190	556

Configuring a report

Select a report in the Reports list and click the Configure icon (or right-click the report in the list and select the Configure User Report option). The Configure User Report window opens to allow editing of the parameters for the selected user report.

What reports are available?

SPM provides the following available types of reports. You select the type you want to generate from the Report Type drop-down list:

- **System:** Inventory, Total Power (W), Power Density
- **General:** Input Current, Input Voltage, Input Power, PIPS Summary,
- **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
- **Energy Consumed:** By Day, By Month, By Year **(POPS Report)**
- **Energy Utilization:** No Usage, Low Usage, High Usage **(POPS Report)**

About the POPS reports

For networks with Per Outlet Power Sensing (POPS) units, reports are available (for administrator accounts) to show energy value readings for electrical consumption and usage, based on individual outlets, devices, outlet groups/outlet clusters, or the entire data center.

The SPM POPS reports are:

Energy Consumed: Produces total energy consumption reports for outlet or infeed billing levels. Reports are available by location, cabinet, CDU, and outlet group/outlet cluster based on a specified timeframe.

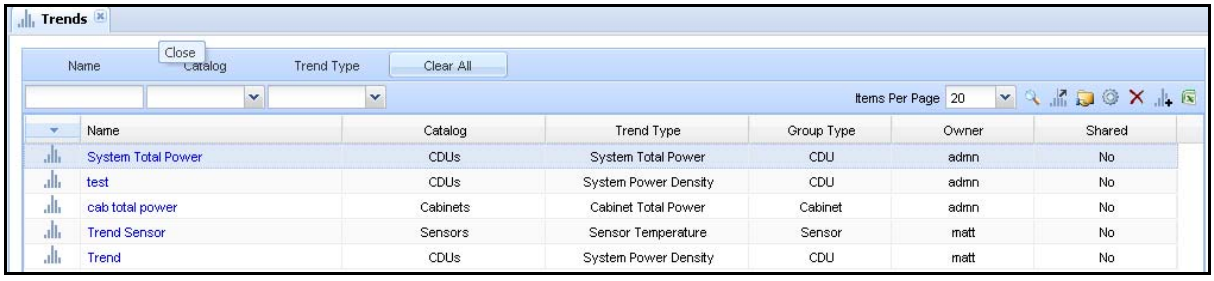
Energy Utilization: Produces reports from energy value readings to measure and evaluate CDU and outlet group/outlet cluster outlet energy usage and efficiency. Reports are available by location, reading, CDU, and outlet group/cluster based on a specified timeframe.

Trends

The Trends module generates graphical reports on specific parameters from available CDU hardware readings. Trend graphs show power trending information (automatically reloaded) for your networked CDUs over a specified time frame.

The Trends Tab

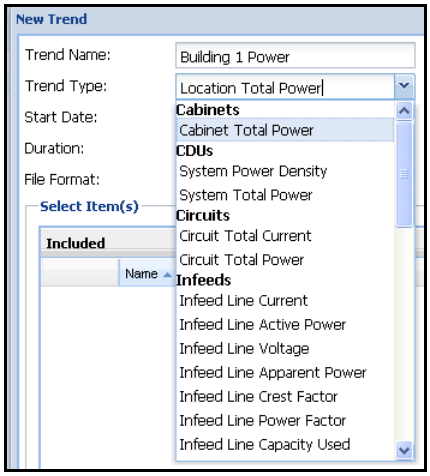
Shows a list of the created custom trend graphs and their parameters.



Creating a new trend graph

Click the New Trend icon (or right-click a report in the Trends list and select New Trend option). The New Trend window opens to allow setting the parameters for the new trend graph.

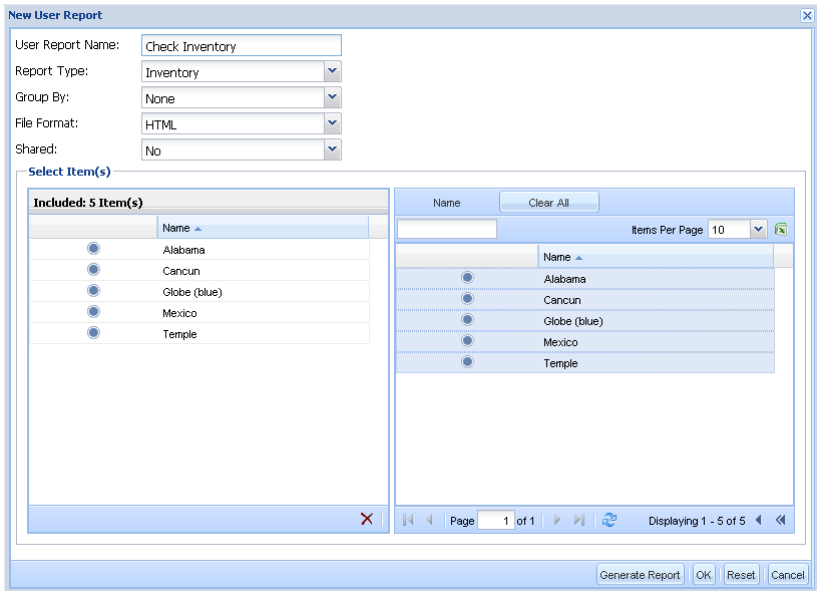
Create a name for your new trend graph in the Trend Name field, and then select from several trend types shown in the drop-down list.



Provide a start and end date range for the trend reporting period, and select the trend duration, for example, report on the last 3 hours, the last day, the last 6 months, or several other duration choices.

Trend graph formats can be PDF, XML, or PNG (in small, medium, or large images).

The New User Report window also lets you select the objects from the data list on the right and drag one or more objects to the left to be included in the report, such as the locations shown in this example:



Configuring a trend graph

Select a report on the Reports list and click the Configure icon (or right-click the report in the list and select the Configure User Report option). The Configure User Report window opens to allow editing of the parameters for the selected user report.

What trend graphs are available?

SPM provides the following available types of trend graphs. You select the type you want to generate from the Trend Type drop-down list:

- **Cabinets:** Cabinet Total Power
- **CDUS:** System Power Density, System Total Power
- **Circuits:** Circuit Total Current, Circuit Total Power
- **Infeeds:** Infeed Line Current, Infeed Lind 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, Line Total Power.
- **Locations:** Location Total Power
- **Outlets:** Outlet Current, Outlet Active Power, Outlet Voltage, Outlet Apparent Power, Outlet Crest Factor, Outlet Power Factor, Outlet Capacity.
- **Outlet Groups:** Outlet Group Total Current, Outlet Group Total Power.
- **Outlet Clusters:** Outlet Cluster Total Current, Outlet Cluster Total Power.
- **PIPS:** PIPS Capacity Used, PIPS Active Power, PIPS Apparent Power, PIPS Power Factor.
- **Sensors:** Sensor Temperature, Sensor Humidity.
- **Zones:** Zone Total Power.

Logs

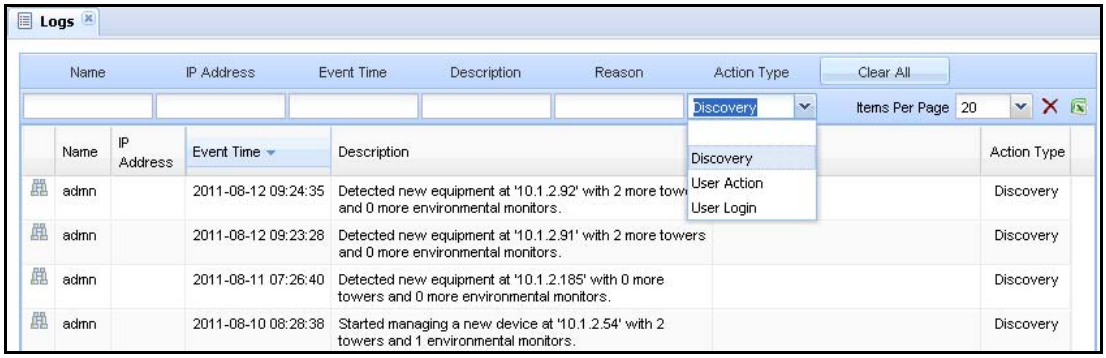
The Logs module provides dynamic logs of system events that occur for device discoveries, user actions, and user logins.

The Logs Tab

Displays the last log viewed and allows access to the Action Type drop-down list to select the Discovery, User Action, and User Login.

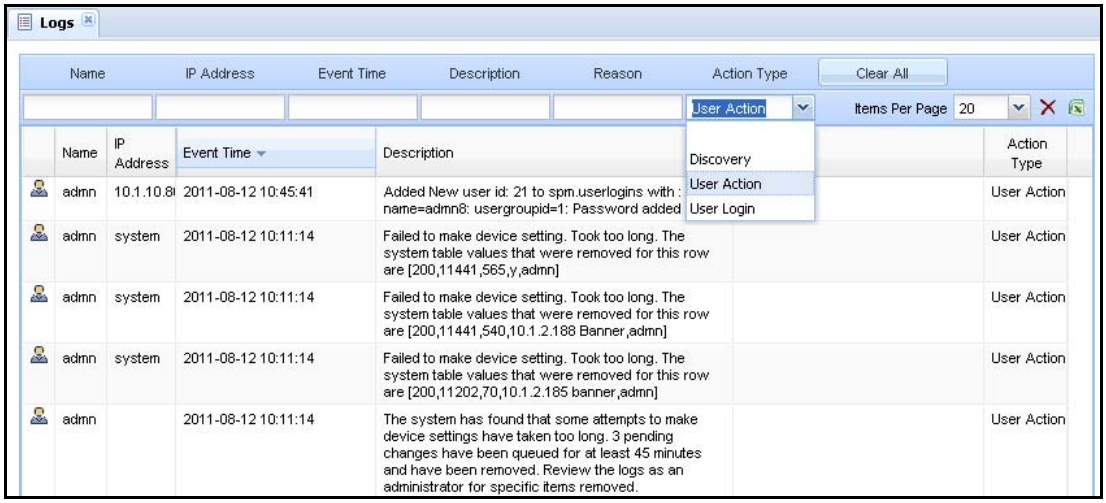
Discovery log

Lists event details that occur during SPM's discovery of CDUs (and other devices) in your network. The most current logged event displays first.



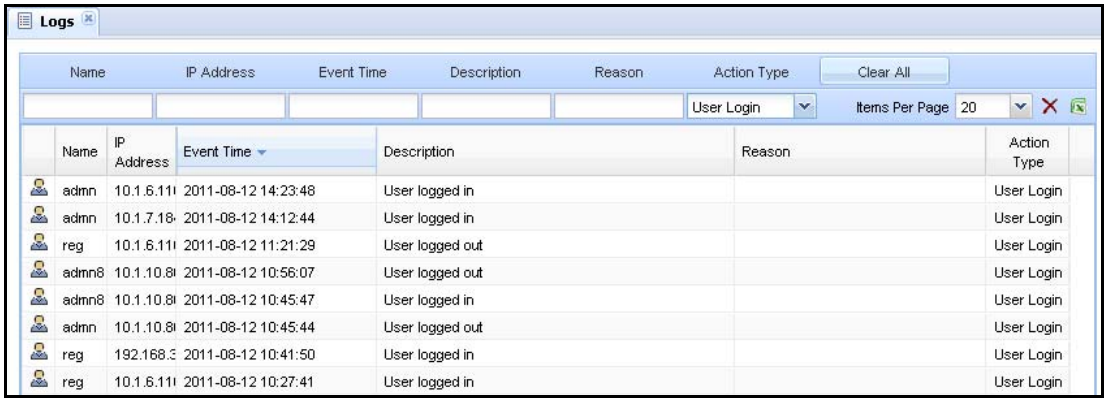
User action log

Displays user-initiated activities, such as a location enabled, the setting of a parent location, the converting of temperature units, and many more system actions when users are logged in and working with SPM. The most current logged event displays first.



User login log

The User Login Log reports the login/logout time for each SPM user and the IP address of the related device. The most current logged event displays first.



Working with the Logs

Advanced filtering search

Type characters in the input fields (Name, IP Address, Event Time, Description, and Reason) at the top of the logs window for advanced filtering searching of the logs. Click the **Clear All** button to clear the filter input fields.

Items per page

Select a number from the Items Per Page drop-down list to customize the number of data rows that display on a single page.

Alarm Management (Alarm History and Active Alarms)

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 module with an alarm history log and an active alarms log.

What's a "Rolled Up" Alarm?

SPM reports status and alarm conditions for devices, but also for main 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. Keep in mind 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.

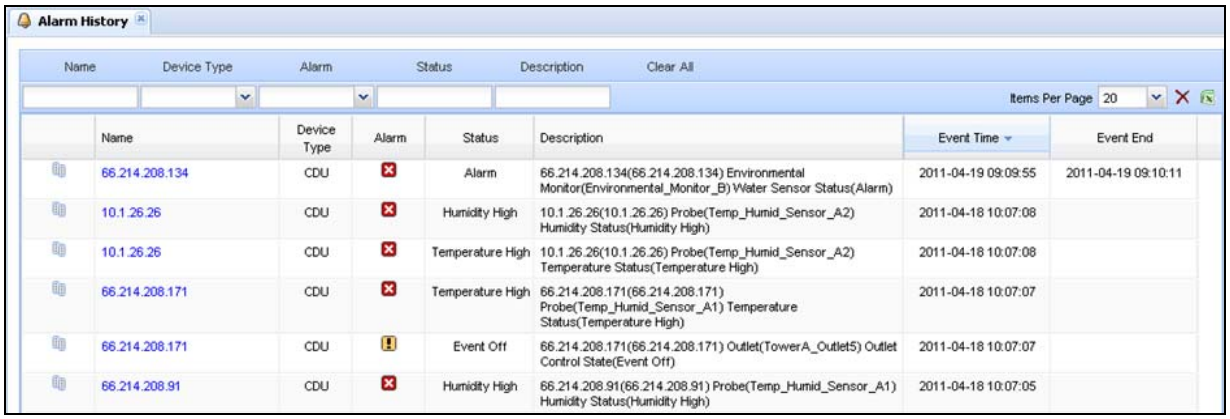
However, if CDU-1 or CDU-2 reports a Critical alarm due to exceeded thresholds, then Cab-123 and Floor-1 report as Critical.

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.



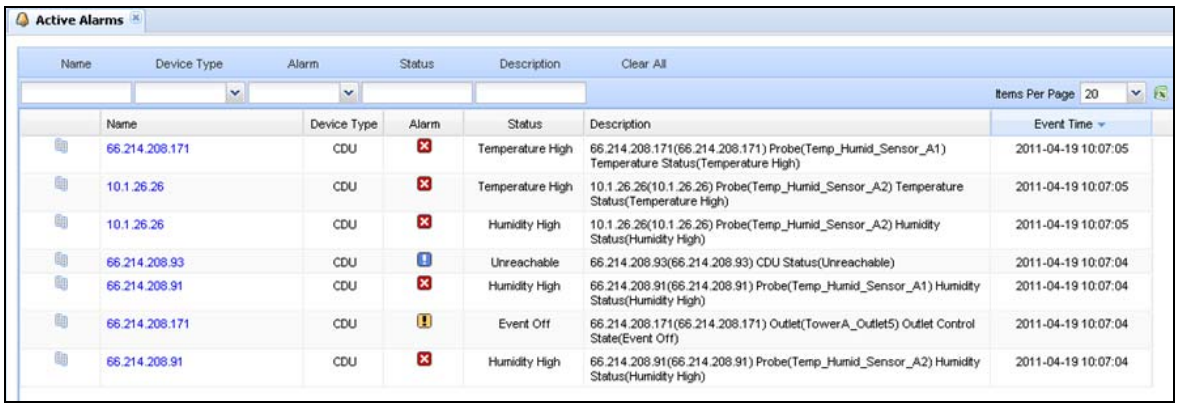
Alarm history information shows an operational pattern that can assist you with revising equipment maintenance schedules and preventing future device and network issues.

Active Alarms

SPM's 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.



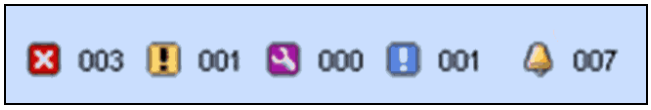
Name	Device Type	Alarm	Status	Description	Event Time
66.214.208.171	CDU		Temperature High	66.214.208.171(66.214.208.171) Probe(Temp_Humid_Sensor_A1) Temperature Status(Temperature High)	2011-04-19 10:07:05
10.1.26.26	CDU		Temperature High	10.1.26.26(10.1.26.26) Probe(Temp_Humid_Sensor_A2) Temperature 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 main SPM system objects:

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

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 7: Configuring SPM (for the administrator)

This chapter covers the configuration of the SPM system. Configuration is performed by SPM administrative-level user accounts, and involves determining settings for the SPM system, settings for the network, and email notification parameters.

System Setup

The System Setup module provides access to configuration settings for the SPM system, settings for the network, and email notification parameters.

The Configuration Tab

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

SNMP

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.

Server settings

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

Syslog

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.

The Network Tab

Provides the parameters to establish a primary/default network (Network 1) and up to three additional network ports for SPM remote access.

Network 1 (default)

These 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) and the primary/secondary DNS names if you want a domain name association for IP addresses.

Networks 2, 3, and 4 (optional)

Optional networks if you want additional secondary network ports. Network 2 allows for an additional subnet mask and gateway. Networks 2, 3, and 4 allow for automatic port configuration using DHCP.

The Email Notification Tab

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

Email server

This section configures the SMTP host name/port number and the sending email address.

Notification categories

Select the logs that you want emailed to the recipients: Discovery, Alarm Status, User Login, User Actions. All recipients will receive the same logs at the same time.

Recipients

Provide up to four separate recipient email addresses.

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.

Manage Users

The Manage Users feature provides access to configuration settings for the SPM users, user groups, and LDAP. Individual users can manage their accounts and preferences.

Capabilities are the predefined levels of access rights to the device-related operational functions of SPM as granted by the administrator to individual users in named user groups.

SPM recognizes the following user types and capabilities:

SPM User Types

Type	Capability
Administrator	Full access for all configuration, control (On, Off, Reboot), status, and serial/pass-thru ports. The SPM default administrative user is the **admn** username (password is also **admn**). Note there is no "l" in the **admn** username/password. The **admn** user can grant full administrative access rights to other users. **Note:** For security, Server Technology recommends that you first use the **admn** user account to grant capabilities to another administrative user account. Then use the new account to change the default **admn** username and password. The **admn** account cannot be deleted or demoted.
On	Allows user access to turn on an outlet. A user assigned access to an outlet (that is currently turned off) can turn the outlet back on again with the On capability but cannot turn the outlet off.
Regular	Partial access to control (On, Off, Reboot), status, and pass-thru of assigned outlets, outlet groups, outlet clusters, and serial/pass-thru ports.
Reboot	Partial access for control (Reboot), status, and pass-thru of assigned outlets, outlet groups, outlet clusters, and serial/pass-thru ports.
View Only	Partial access for status and pass-thru of assigned outlets, outlet groups, outlet clusters, and serial/pass-thru ports.

The 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.

The 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

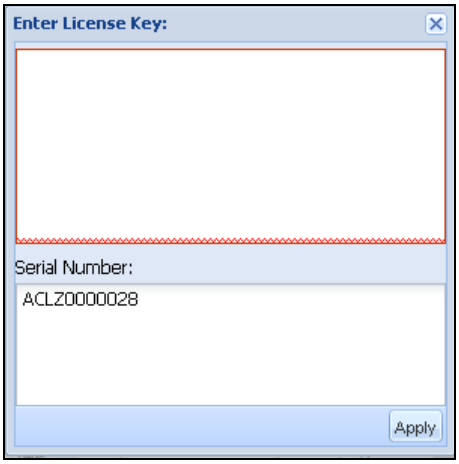
The User Groups Tab allows the administrator to configure user group permissions by granting or denying access to SPM system resources.

The LDAP Settings Tab

Enables authentication with LDAP servers to establish LDAP for use with SPM. Recommended fields values are displayed in the LDAP settings window.

Add License

The Add License function allows the SPM administrator to add more CDUs to the SPM network.

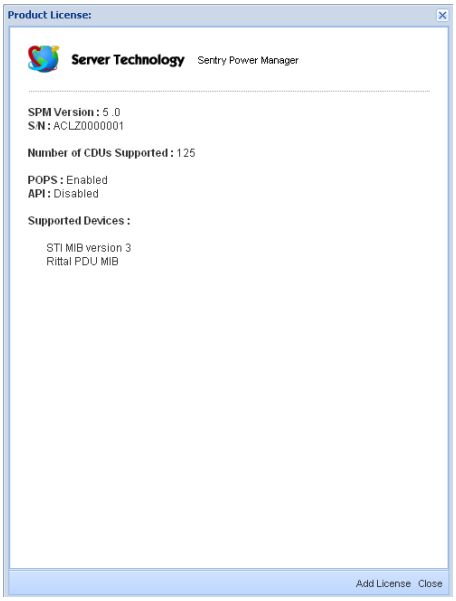


For the SPM Administrator:

Go to **System Setup > Add License**

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

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



For all SPM users:

Go to **Application Help > Product License**

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

This window displays the SPM version, serial number, total number of supported CDUs in the network currently communicating with SPM, additional features enabled/disabled (such as POPS and/or the SPM API), the STI-MIB-supported devices, and the model names of supported OEM and competitor devices

Chapter 8: 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.

For information on how to recycle this product responsibly in your country, please visit the Server Technology website at: www.servertech.com

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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Reno, Nevada 89521 USA	Fax:	775.284.2065	Email:	support@servertech.com

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

Server Technology

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