



# Sentry Power Manager

## Operations Manual



### 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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- the customer assumes all such risks, and
- the liability of Server Technology is adequately protected under the circumstances.

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# Chapter 1: Introduction

## Welcome to Server Technology's Sentry Power Manager!

The Sentry Power Manager (SPM) provides real-time enterprise power management of Cabinet Distribution Units (CDUs) in one or more remote data center locations.

As a secure software application on the web, Sentry Power Manager communicates with networked and discovered CDUs. Sentry Power Manager's graphical interface allows monitoring and management of remote CDUs in all locations of your entire network from a single console.

Sentry Power Manager gives a top-level view of the data center and allows drill down to the critical operational details of each cabinet and CDU. You can visualize, monitor, and optimize enterprise devices, and generate data reports and trend graphs by customized time frame and parameters.

### Top Features of Sentry Power Manager:

- Real-time CDU status and notification of alarms reported dynamically (using SNMP traps), to allow monitoring and immediate outlet control over CDU operating conditions, including power, temperature, and humidity.
- Generation of several informational highly-accurate energy usage reports based on individual outlets, devices, groups (outlets/cabinets), or the entire data center.
- Server Technology's "clustering" technology allows the gathering (clustering) of CDUs across individual IP addresses, multiple CDUs, and the entire data center for power monitoring. Reported data can be used for calculating data center efficiency.
- Custom trend graphs can be generated with a mix of various critical operating parameters, such as temperature, humidity, infeed load, and power.
- Visualize the network by configuring a custom view of the data center as a hierarchy of levels, such as locations, buildings, floors, rooms, and other specific areas with imported background maps and custom images. Place cabinet and CDU icons on the images to view equipment conditions graphically by status, load, power, and capacity. Click icons on the maps to drill down from higher data center levels to detailed CDU operating parameters.

## Technical Support



Experience Server Technology's FREE **SMARTER** Technical Support - [Learn more...](#)

Server Technology understands that there are often questions when installing and/or using a new product. Free Technical Support is provided from 6:00 AM to 7:00 PM, Monday-Friday, Pacific Time.

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## Chapter 2: Getting Started

*For the administrator:* The following list summarizes the step-by-step tasks to help you quickly configure Sentry Power Manager (SPM) to build a graphical data center view, user base, and device connections. The configurations allow connection and communication with your current established network.

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**NOTE:** Before you begin, make sure you have enabled SNMP.

---

### **Connect and Login**

#### **Connect to Sentry Power Manager**

Upon connection to Sentry Power Manager, a web browser is directed to the local host name or IP address of the Sentry Power Manager server. You then login as the default administrative user with username/password: **adm**n/**adm**n.

### **Create a New Administrative Account**

#### **Create a new administrative user account with Config > Users on page 61.**

For security, it is recommended that you first use the default **adm**n user account to grant access rights to another administrative user account. Then using the new administrative account, change (or delete) the default **adm**n user account. The **adm**n account cannot be demoted or deleted until you have already granted administrative access rights to another user account.

### **Discover Network Devices**

#### **Configure supported devices for discovery with Config > CDUs > Discover CDUs on page 52.**

Device management starts with adding Cabinet Distribution Units (CDUs) to the SPM network inventory. The Discovery feature allows the adding of devices in bulk (IP address range) by searching for SNMP-enabled CDUs across multiple subnets in the network for communication with SPM.

### **Configure Device Settings**

#### **Locations: Configure locations with Config > Locations on page 48.**

Import, configure, and manage default maps and custom images to be displayed on the Views page as the background for location, cabinet, and device icons.

#### **Cabinets: Configure cabinets with Config > Cabinets on page 55.**

Manage cabinets by adding, editing, and deleting; specify cabinet area (in square ft.) for calculation of system wattage; associate a cabinet with a location (background) image.

#### **CDUs: OPTIONAL. Add a single CDU by its IP address with Config > CDUs > Add CDU on page 54.**

The Add CDU function allows adding one CDU at a time by exact IP address to the network. This is the same function as **Config > Discover CDUs**, but Add CDU is a manual function available as a convenience after bulk discovery when a single CDU or a few CDUs need to be added.

#### **CDUs: Configure CDUs with Config > CDUs > Configure CDUs on page 55.**

Configure CDUs by IP address by naming the CDU, establishing SNMP Get/Set parameters, providing device capacity, deleting CDUs, and associating a CDU with a cabinet/location.

#### **CDUs: OPTIONAL. Configure Environmental Monitor with Config > CDUs > Environmental Monitors on page 56.**

If an Environmental Monitor is connected to a CDU, the name of the environmental monitor and its sensors can be edited, and sensor high/low thresholds for temperature and humidity can be set .

#### **CDUs: Configure Enclosures using Config > CDUs > Enclosures on page 57.**

Edit the names of enclosures, infeeds, and outlets for an individual CDU, and configure the power load of the enclosure (in amperes).

## **Configure User Groups and Grant Device Permissions**

**Create user groups at Config > User Groups on page 63.**

Create a new user group and assign the user group to an access rights level (user type), such as administrative, regular user, view-only, or reboot-only. For user type descriptions, see *About User Types* on page 47.

**Assign user group permissions to networked devices at Config > Group Permissions on page 69.**

When you create a new user group, you are prompted by the device permissions page to grant access rights by individual user group (or by all user groups) to networked clusters, locations, cabinets, CDUs, and outlets.

## **Configure New Users**

**Create a new user and assign to a user group at Config > Users on page 61.**

Create a new user and password. Assign the new user to a user group created in with **Config > User Groups** above. All access rights granted for the user group to networked clusters, locations, cabinets, CDUs, and outlets will be applied to the new user.

## **Build a Graphical Data Center**

**Select maps and images for Views page at Config > Locations on page 48.**

Select default maps or your own custom images as the graphical background to depict customized levels of your data center.

**Place a location icon  on a location (background) image at Config > Locations on page 48.**

Associate a location icon with a location (background) image and position the icon on the image using the Views page.

**Place a cabinet icon  on a location (background) image at Config > Cabinets on page 50.**

Associate a cabinet with a location image and position the icon on the image using the Views page.

**Place a CDU icon  on a location (background) image at Config > CDUs > Configure CDUs on page 55.**

Associate a CDU with a location image and position the icon on the image using the Views page.

## **Optional Features**

You can configure the following optional features of SPM in any order:

### ***Outlet Groups/Outlet Clusters***

Configure outlet groups/outlet clusters at **Config > Clusters on page 58.**

Create outlet groups and/or outlet clusters for remote reboot and power information. Grant access for locations, CDUs, and outlets to the outlet group/outlet cluster.

### ***Light Directory Access Protocol (LDAP)***

Configure LDAP parameters at **Config > LDAP on page 66.**

LDAP support enables authentication with LDAP servers so that user accounts do not need to be individually created locally on each Sentry CDU.

### ***Email Notification***

Configure email notifications at **Config > Email on page 74.**

Configure email notifications for the SPM logs: Discovery, User Login, User Actions, and Alarm Status.

### ***Access Network Settings***

Determine Access settings at **Config > Access on page 76.**

The Access feature lets SPM connect to, and communicate with, your current established network. Access provides the basic configuration options for setting up SPM as an appliance without the need to configure through the operating system. The connectivity options are configuration for web, serial port, and Telnet.

## ***Backup***

Determine Access settings at **Config > Backup on page 75**.

The Backup feature gives the administrator a database backup function that extracts SPM system data from the database and compresses the data to a file. The Backup feature creates the SPMDBackup.sti file for storage on the SPM appliance. If needed, the SPMDBackup.sti file can manually be used to restore the SPM database.

## ***Open Database Connectivity (ODBC)***

SPM provides external access via ODBC to other systems. Access is one way only: data can be retrieved but not updated from an external source.

The ODBC connectivity is a method for using database management systems, independent of programming languages, database access, and operating systems.

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**NOTE:** To purchase the ODBC option, please contact your Server Technology representative at 1-800-835-1515 (domestic), ++0 (1) 775.284.2000 (international), or [sales@servertech.com](mailto:sales@servertech.com).

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## Chapter 3: Using Sentry Power Manager

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## System Requirements

### For the Web Browser

The web browser requirements for Sentry Power Manager are:

- Internet Explorer 6.0+ (Service Pack 1) or Firefox 2.0+
- Recommended screen resolution: 1024 x 768

## Connecting to Sentry Power Manager

Connecting to Sentry Power Manager requires directing a web browser to the local host name or IP address of the Sentry Power Manager server.

### Using the Web Connection

Connect to the Sentry Power Manager default IP address at: <http://192.168.1.254>.

### The Login Page

Connection to Sentry Power Manager displays the following login page:



The screenshot shows a web browser window displaying the Sentry Power Manager login page. At the top left is the Server Technology logo, which consists of a stylized globe icon and the text 'Server Technology' in a blue font. Below the logo is the tagline 'Solutions for the Data Center Equipment Cabinet'. The main heading is 'Sentry Power Manager' in a bold, black font. Below the heading are two input fields. The first is labeled 'Username:' and contains the text 'adm'. The second is labeled 'Password:' and contains four black dots. To the right of these fields is a blue button with the text 'Login' in white.

The username/password for the default administrative account is **adm/adm**.

## Working with the Interface

The following sections introduce the pages and features of the Sentry Power Manager (SPM) interface and provide instructions for using enterprise management functions.

### Touring the Views Menu

The following Views option provides access to Sentry Power Manager functions:

#### Views Menu Options

Option	Description
Views	Provides at-a-glance monitoring of enterprise locations, cabinets, and CDUs using colored-coded icons positioned on background (location) images. The Views page displays networked equipment by the vantage points of operating status, load, power, temperature, humidity, or capacity.

The administrative login to SPM displays the following Views page as the graphical overview of your data center. The page allows point-and-click monitoring of network status and control of discovered devices.

The screenshot displays the SPM Views page. At the top right is the Server Technology logo. The navigation bar includes 'Views', 'CDU', 'Reports', 'Config', and 'Help'. The user is logged in as 'adm' with Administrator access. A status summary on the left shows: Critical (1), Warning (3), Unreachable (0), Normal (6), and Maintenance (0). Below this is a search bar with a 'CDU Name' dropdown and a 'Search' button. The main area features a globe map with a red location icon. A legend at the bottom identifies status colors: Critical (red), Warning (yellow), Unreachable (blue), Normal (green), and Maintenance (orange). Another legend identifies symbols: Location (blue circle), Cabinet (grey triangle), and CDU (grey vertical bar). The footer contains copyright text and the website URL.

### Using Location Images

Maps and other images are the backgrounds on the Views page where you place icons to depict various locations and devices in your data center. Location images represent data center levels as you want to customize those levels, such as buildings, floors, and rooms.

In the example above, a round (location) icon was placed on the default global map to represent a specific data center location. The color of the icon is based on the values displayed in the Legend at the bottom of the page. The icon in the example is a location containing a device in Critical (red) status.

The default global map and other default maps are installed with SPM, however, you can import your own graphics files (JPG, PNG, or GIF formats only) to use as custom location images.






**NOTE:** The administrative login has full access to default maps and any other custom location images. However, new users have limited access to the Views menu until granted access rights by the administrator with **Config > Users** and **Config > Group Permissions**.

## Acknowledging Alarms and CDU Status

The Status box is the real-time and graphical reporting of alarms and status changes occurring in a discovered CDU that is monitored by Sentry Power Manager (SPM).

As an SNMP TRAP destination for the Sentry Switched and Smart CDU, Sentry Power Manager can enable the distribution of device alarm notifications and status reporting throughout the system.

The Status box displays in a fixed size and position in the left pane of the SPM interface. As a CDU communicates its status to SPM, the status is reported in one of five categories shown in the Status box. SPM only reports status as received from a discovered CDU, and the operating condition of the CDU determines the severity of the status category.

Status		
	Critical	1
	Warning	3
	Unreachable	0
	Normal	6
	Maintenance	0

Each status category in the Status box is represented by an icon, the category name, and the total number of CDUs (in **red** for Critical and Warning) currently reported in the category.

To acknowledge a CDU reported in the Status box, click the icon for the category. The **CDU > Manage** page opens and displays the operating details of the reported CDU where you can review and manage the current condition of the CDU.

The condition of a CDU is reported in one of five categories:

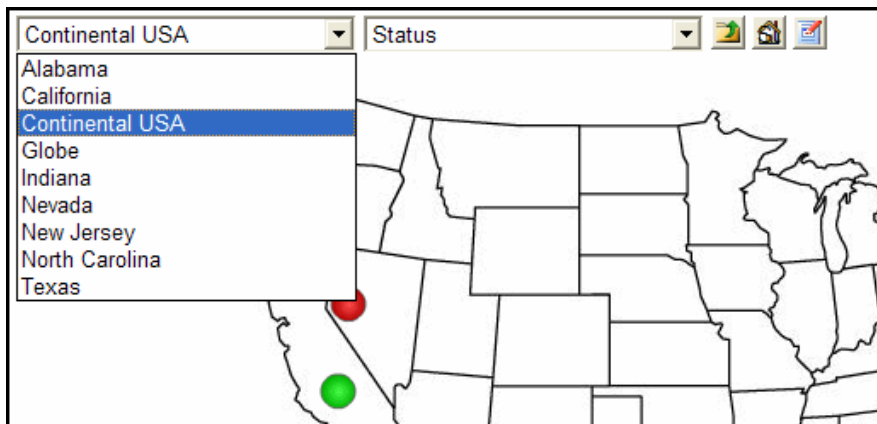
### Status Categories

Status	Description
Critical	CDU is in a critical (not Normal) alarm status based on SNMP traps sent and requires user action.
Warning	CDU is in a warning state indicating a change in outlet status.
Unreachable	SPM is unable to communicate with the CDU.
Normal	CDU does not show alarm conditions or reported outlet status changes.
Maintenance	An alarm has been acknowledged and the CDU placed in the Maintenance category; the CDU remains in Maintenance (for the time period specified or until manually removed), and then returns to its original status category; connection can still be made to the CDU; the CDU is monitored and receives SNMP traps; active warnings and critical alarms are displayed in the Reason field/More link, but alarms do not cause a status change.

### Choosing Location Images for the Data Center

The drop-down list in the upper left of the Views page provides the graphic files installed with SPM, as well as any custom graphic files the administrator has added (in JPG, PNG, or GIF formats only) using **Config > Locations**.

Any graphic files (maps or custom images) in the list are the backgrounds that represent different levels – or locations – of your data center, such as a building, floor, room, or other specific area.



The background files display in the drop-down list by their assigned name. The image file you select provides the working background where you place icons representing data center locations, cabinets, and CDUs.

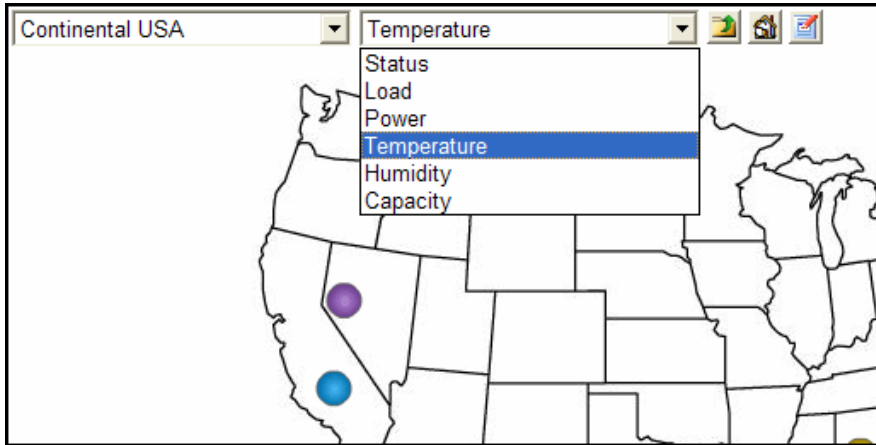
In the previous example, “Continental USA” was selected as the location image, showing two round location icons that were placed by the administrator to represent a data center location in Nevada (containing a device in Critical **red** status) and a location in California (containing a device in Normal **green** status). The images available in the list are determined by the administrator.

The levels of the data center in location images can range from global maps to detailed images, depending on how the administrator decides to represent the data center network. By selecting a location image from the drop-down list and viewing the graphical status of device icons, an SPM user can quickly monitor and/or manage the data center, based on user access rights.

## Monitoring the Current View

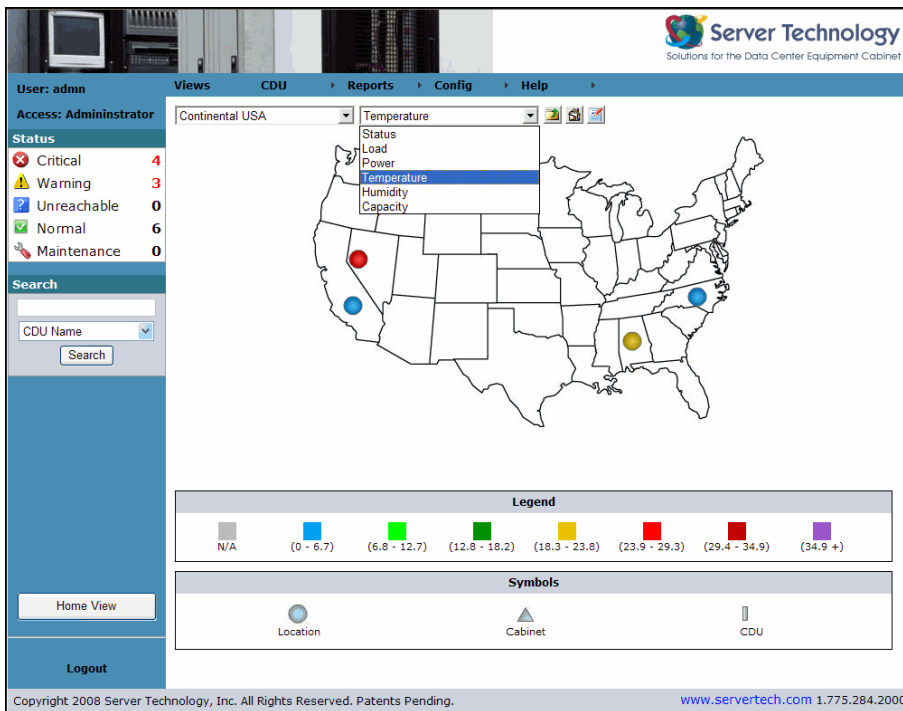
The drop-down list at the top of the Views page provides the six different views of a CDU for any location image selected from the location drop-down list.

For example, if “Continental USA” was selected as the location image, then the devices on the image can be monitored by any of the six views, as the “Temperature” view was selected in the following illustration:



The six views are based on different variables as measured and reported by the CDU for its current status, load, power, temperature, humidity, and capacity. The views are fixed and cannot be configured but they allow quick, visual monitoring of a location, cabinet, or CDU by color.

Each view you select corresponds to a value range displayed in the Legend shown at the bottom of the Views page. For example, the “Temperature” view selected in the above example automatically displays the temperature value range for each of the four icons on the map



Based on the colored location icons and the matching color ranges in the Legend for the Temperature view, you can quickly determine the temperature of a CDU in a specific data center location.

Some CDUs do not support all types of data. For example, if temperature data is not available from the CDU to be measured and reported, the icon on the location image will be gray to correspond to the gray label “N/A” in the Legend.

A CDU can be monitored by any of the following vantage points:






### CDU Current Views

View	Description
Status	Status of the CDU: Critical, Warning, Unreachable, Maintenance, or Normal.
Load	Load of the CDU in amperes.
Power	Power reporting from the CDU in watts.
Temperature	Temperature of the CDU in degrees Celsius.
Humidity	Relative humidity of the CDU in percentage.
Capacity	Input load capacity used by the CDU in amperes.

### Controlling the Views Page Layout

*For the administrator:* The following buttons appear in a row at the top of the Views page to control displaying parent location, establishing home location, and moving icons around the location image:

### Views Page – Buttons

Button	Description
	<b>Go to the parent of this location.</b> From the displayed location image on the Views page, move up one level in the configured hierarchy of location images. For example, move up from the “Nevada” map to the “Continental USA” map.
	<b>Set this location as the home location.</b> Sets the current Views page location image as the default home location and prompts to confirm. Same as the Home View button in the left pane.
	<b>Edit/move icons.</b> Click this button and move location, cabinet, and CDU icons around the current location image to position them as desired, and then click Save or Cancel.
	<b>Save layout changes.</b> After positioning location, cabinet, and CDU icons on the current location image, to save your changes, click the Save button.
	<b>Cancel layout changes.</b> After positioning location, cabinet, and CDU icons on the current location image, to cancel your changes, click Cancel icon.

## Introducing the Current View Legends

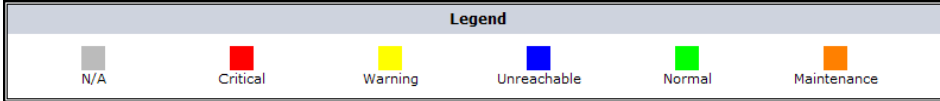
The Legend displays at the bottom of the Views page in response to the current CDU view you selected from the drop-down list: Status, Load, Power, Temperature, Humidity, or Capacity. A unique Legend displays for each CDU view. Legends and their colors and ranges are fixed and cannot be changed.

As a CDU reports its current operating status or other measurable conditions, the colors of the location, cabinet, and CDU icons displayed on the location images change to match the color value ranges in the Legend. By comparing an icon color to a color range in the Legend, you can visually monitor a specific CDU in the data center.

Legends and color range values are shown as follows for the current CDU view. Note that if a CDU view, for example, Humidity, does not apply to an icon, the icon displays gray on the location image on the Views page as shown in the Legend as “N/A”.

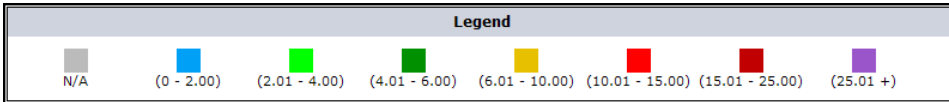
### Status

The colors in the Status view indicate the current condition (status) of the CDU:



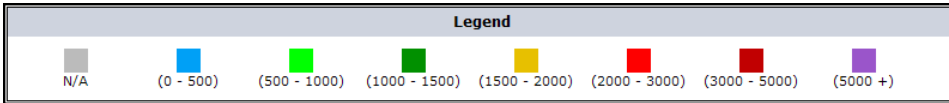
### Load

The color range in the Load view indicates the number of amperes used by the CDU:



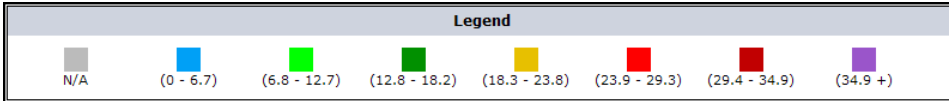
### Power

The color range in the Power view indicates the watts reading of the CDU:



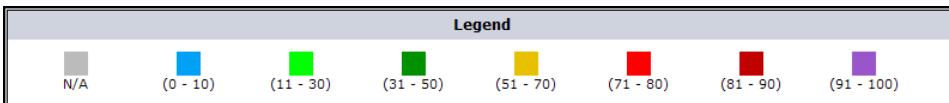
### Temperature

The color range in the Temperature view indicates the temperature of the CDU (in degrees Celsius):



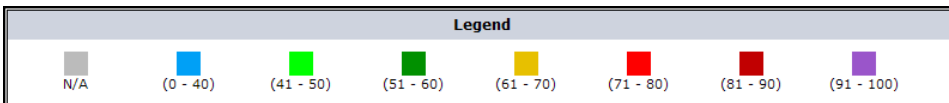
### Humidity

The color range in the Humidity view indicates the humidity of the CDU (in percentage):



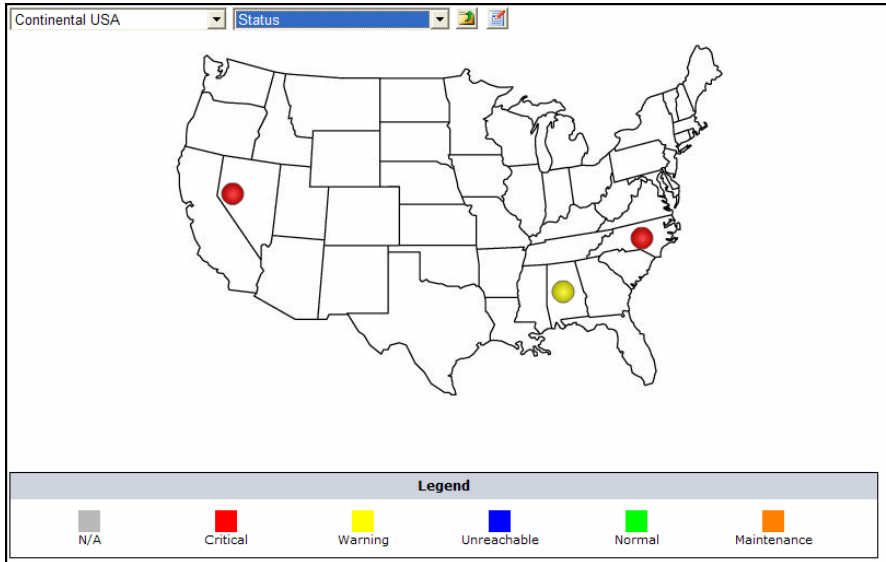
### Capacity

The color range in the Capacity view indicates the input load capacity used by the CDU (in percentage):

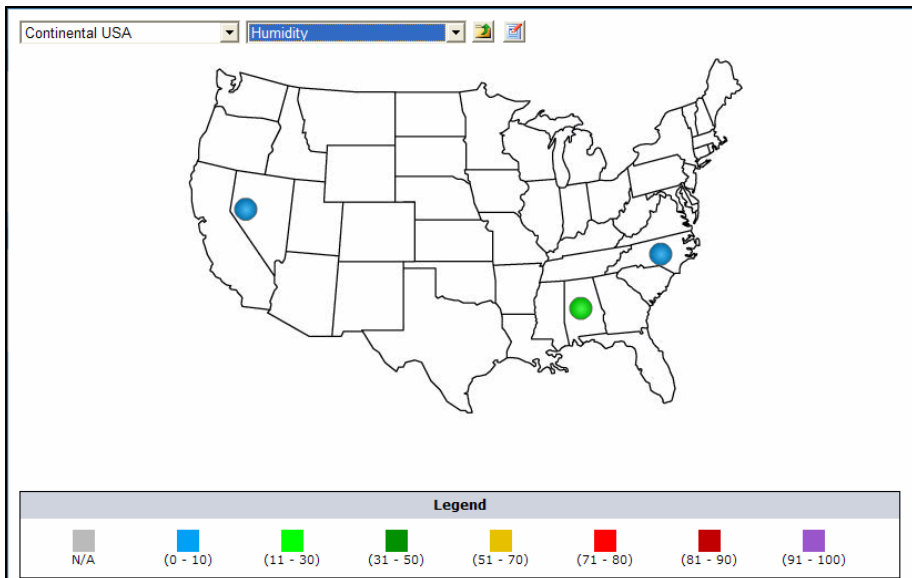


## Example of Legends and Current Views

The following example shows the Status view selected from the drop-down menu and the coordinating Status Legend. The two red icons indicate locations in Critical status; the single yellow icon indicates a location in Warning status.



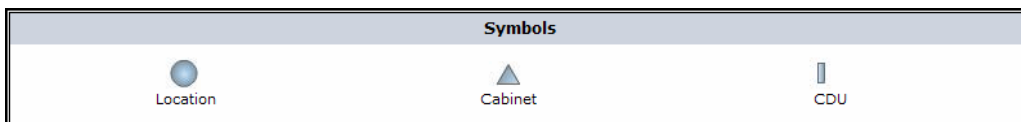
The following example shows the Humidity view selected from the drop-down menu and the coordinating Humidity Legend. The location icons have now changed color to represent their humidity condition, reflected in the value ranges in the Legend.



The Legend remains displayed until you select a different CDU view from the drop-down list.

## Viewing the Symbols (Icons) Legend

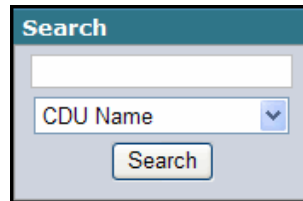
The Symbols legend on the Views page shows the three designated shapes for the location, cabinet, and CDU icons that you can place on the location image in the Views page to represent your data center.



The three symbols (icon) types are fixed and cannot be changed. To place icons on the background image in the Views page, use the **Configuration** menu options for **Locations**, **Cabinets**, and **CDUs**. For more information, see *Working with Icons* on page 22

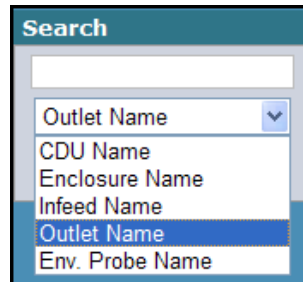
## Searching for a CDU

The Search box is available in the left pane of the SPM interface to provide a search utility to find a desired device in the network.

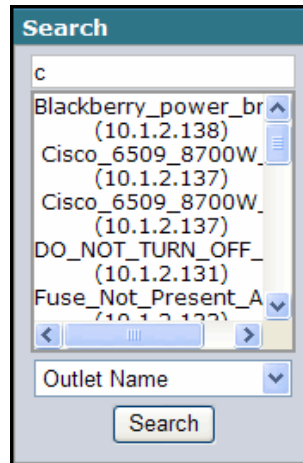


You can search by IP address or by the name of a CDU, enclosure, infeed, outlet, or environmental monitor.

To start the search, click the down arrow and select the type of name from the drop-down list, such as Outlet Name has been selected in this example:



As you start typing the outlet name in the box, a resulting list of matches displays.



Select a name in the list and click **Search**. The detailed search results are displayed on the Enclosure Name page. For example, for the outlet “Cisco\_6509\_8700W\_B(10.1.2.137)”, you would see:

User: admin Views CDU > Reports > Config > Help >

Access: Administrator 10.1.2.137

Status

- Critical 1
- Warning 6
- Unreachable 0
- Normal 4
- Maintenance 2

Search

6509\_8700W\_B (10.1.2.137)

Outlet Name

Search

### Enclosure Name

TowerA


Infeed Name	Status	Load	Power	Voltage	Power
TowerA_InfeedA	On	N/A	N/A	N/A	N/A
Outlet Name	Status	Load	Power	Control State	Control Action
TowerA_Outlet1	Off Error	N/A	N/A	Wake On	None
TowerA_Outlet2	Off Error	N/A	N/A	Wake On	None
Cisco_6509_8700W_A	Off Error	N/A	N/A	Wake On	None
Cisco_6509_8700W_B	Off Error	N/A	N/A	Wake On	None

**NOTE:** The default CDU name is the IP address of the CDU that you can change using **Configuration > CDUs > Configure CDUs**.

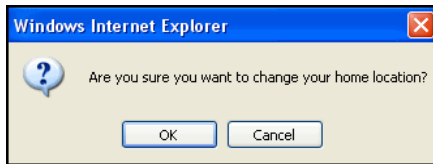


## Setting the Home Location

1. To set a location image in the Views page as your home location, display the desired location image from the locations drop-down list on the Views page.

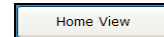
2. Click the “Set this location as the home location” button on the Views page. 

3. Confirm the change:



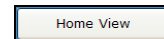
4. The current image will remain as your home location, even after logging off from SPM.

Click the Home View button from any SPM page to return to the Views page and display the location image you set as your home page.



## Returning to the Home View






Click the Home View button from any SPM page to return to the Views page and display the background image you set as your home page.



## Using Buttons on the Views Page

*For the administrator:* The following buttons appear in a row at the top of the Views page to control displaying parent location, establishing home location, and moving icons around the background image:

### Views Page – Buttons

Button	Description
	<b>Go to the parent of this location.</b> From the displayed background image on the Views page, move up one level in the configured hierarchy of background images. For example, move up from the “Nevada” map to the “Continental USA” map (if so configured).
	<b>Set this location as the home location.</b> Sets the current Views page background image as the default home location and prompts to confirm. Same as the Home View button in the left pane.
	<b>Edit/move icons.</b> Click this icon, move location, cabinet, and CDU icons around the current background image as desired, then click Save or Cancel icon.
	<b>Save layout changes.</b> After repositioning location, cabinet, and CDU icons on the current background image, to save repositioning, click Save icon.
	<b>Cancel layout changes.</b> After repositioning location, cabinet, and CDU icons on the current background image, to undo repositioning, click Cancel icon.

## Building a Network Map

For the administrator: SPM offers location, cabinet, and CDU icons to represent the levels of your data center. You can place icons for each level on location (background) images on the Views page. The way you customize these levels determines the hierarchy of your data center displayed on the Views page.


For instructions, see *Working with the Icons* on page 22.

**NOTE:** The administrator login has full access to all default and custom images and icons. The administrator must grant each user account access to individual location images and icons using **Config > Users**.

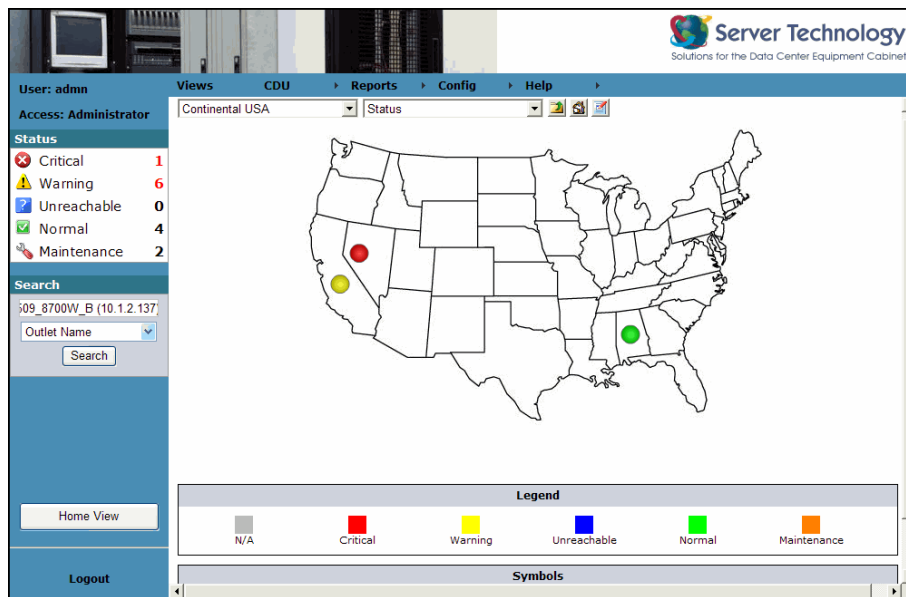
## Working with Data Center Levels: Location, Cabinet, and CDU

Clicking an icon displayed on a location image drills down to a lower level to show device operating details, allowing you to monitor and control outlets, depending on your user access rights.

### The Location Level

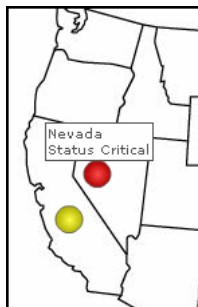
The location icon  on a location (background) image represents a location, such as a city, state, place, building, floor, room, or other area or level specific to your data center.

The following example shows three location icons placed by the administrator on the default location image named Continental USA.

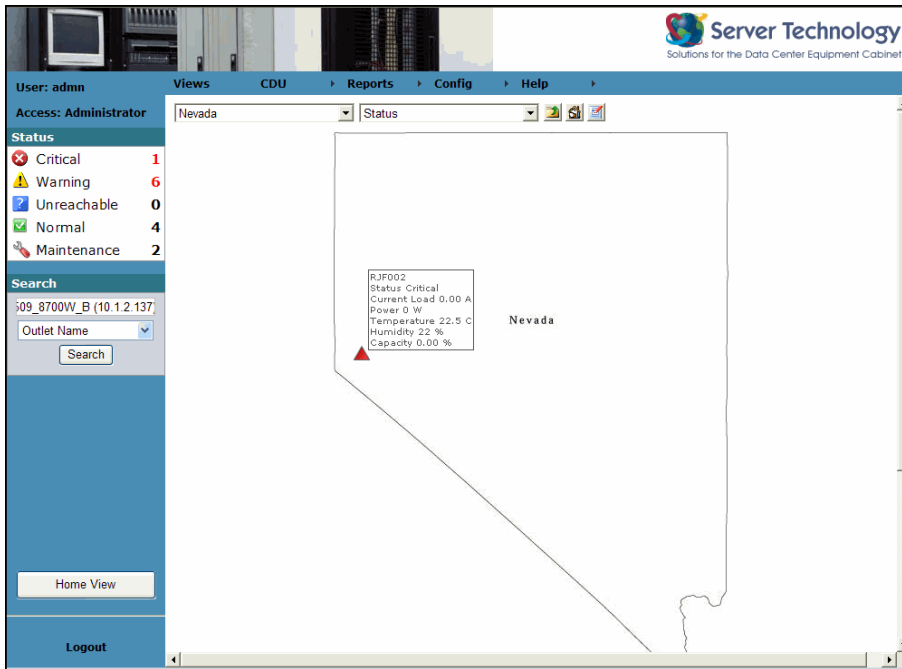


Based on the CDU “Status” View at the top of the page, and the color ranges in the corresponding Legend at the bottom of the page, you can determine the status of CDUs in these locations.

To identify a location, roll the mouse pointer over the location icon, shown as follows for the location named “Nevada” which contains a CDU in Critical (**red**) status:

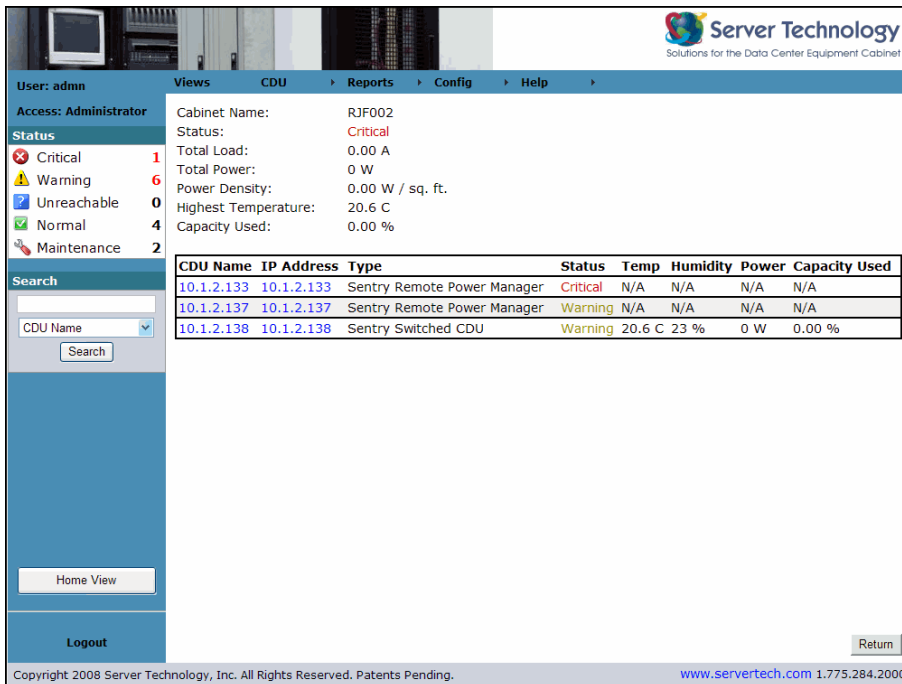


To drill down from the Continental USA background image to the location named “Nevada”, click the Nevada icon to display the Nevada background image:




The above example shows the Nevada location has a cabinet named “RJF002” in Critical (**red**) status and provides a snapshot of the current reported data in the six views: status, load, power, temperature, humidity, and capacity.

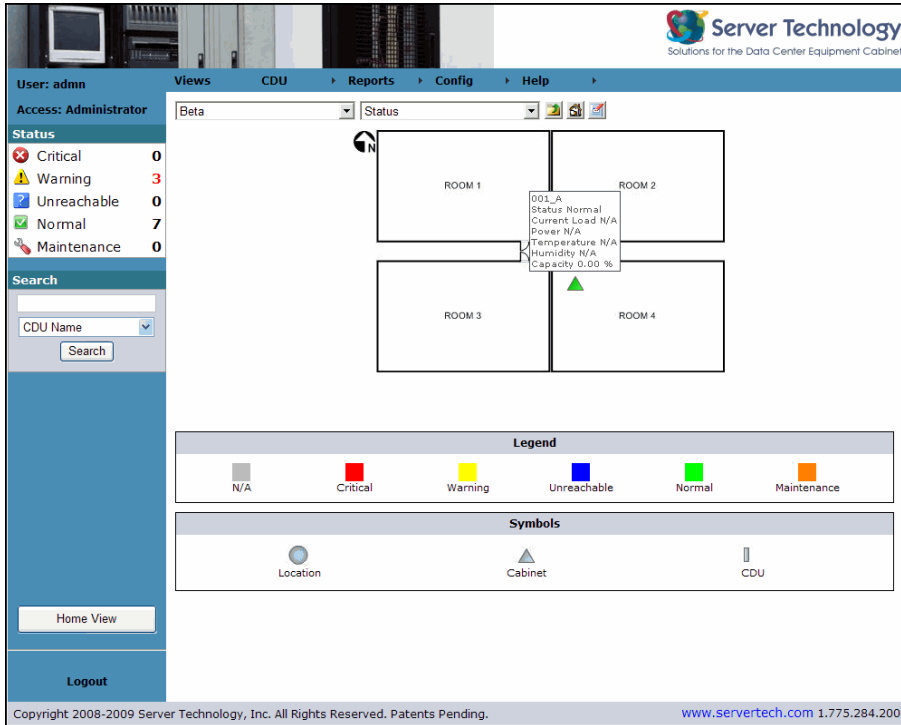
Click the cabinet icon to drill down to the cabinet identification and operational details:



## The Cabinet Level

The cabinet icon  on a location image represents a specific cabinet in your data center.

The following example shows a cabinet icon placed by the administrator on the data center location image named Beta:



The screenshot shows the 'Status' view of the Beta data center. The interface includes a navigation menu (Views, CDU, Reports, Config, Help), a user profile (User: admin, Access: Administrator), and a status summary table:

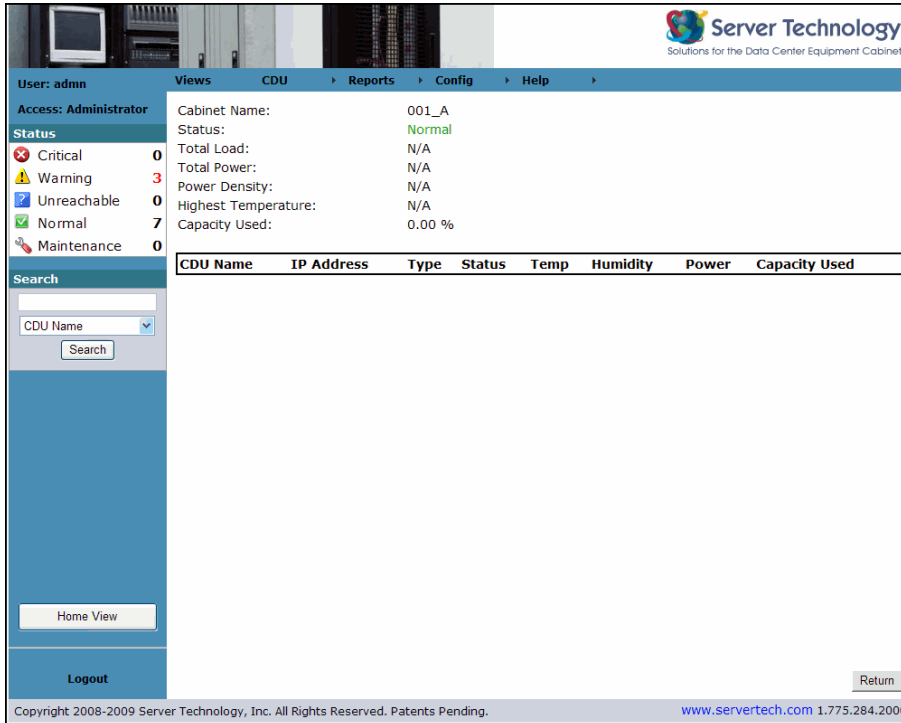
Status	Count
Critical	0
Warning	3
Unreachable	0
Normal	7
Maintenance	0

The data center layout shows four rooms: ROOM 1, ROOM 2, ROOM 3, and ROOM 4. A cabinet icon (a triangle with a vertical line) is located in ROOM 4. A tooltip for cabinet 001\_A displays the following details:

- 001\_A
- Status: Normal
- Current Load: N/A
- Power: N/A
- Temperature: N/A
- Humidity: N/A
- Capacity: 0.00 %

A legend at the bottom identifies the status colors: N/A (grey), Critical (red), Warning (yellow), Unreachable (blue), Normal (green), and Maintenance (orange). Symbols include Location (circle), Cabinet (triangle with vertical line), and CDU (vertical bar).

The Status view shows the cabinet, named 001\_A, in Normal (green) status. To drill down to the operational details listed for the cabinet, click the cabinet icon.



The screenshot shows the detailed status view for cabinet 001\_A. The interface includes a navigation menu (Views, CDU, Reports, Config, Help), a user profile (User: admin, Access: Administrator), and a status summary table:

Status	Count
Critical	0
Warning	3
Unreachable	0
Normal	7
Maintenance	0


The detailed status for cabinet 001\_A is as follows:

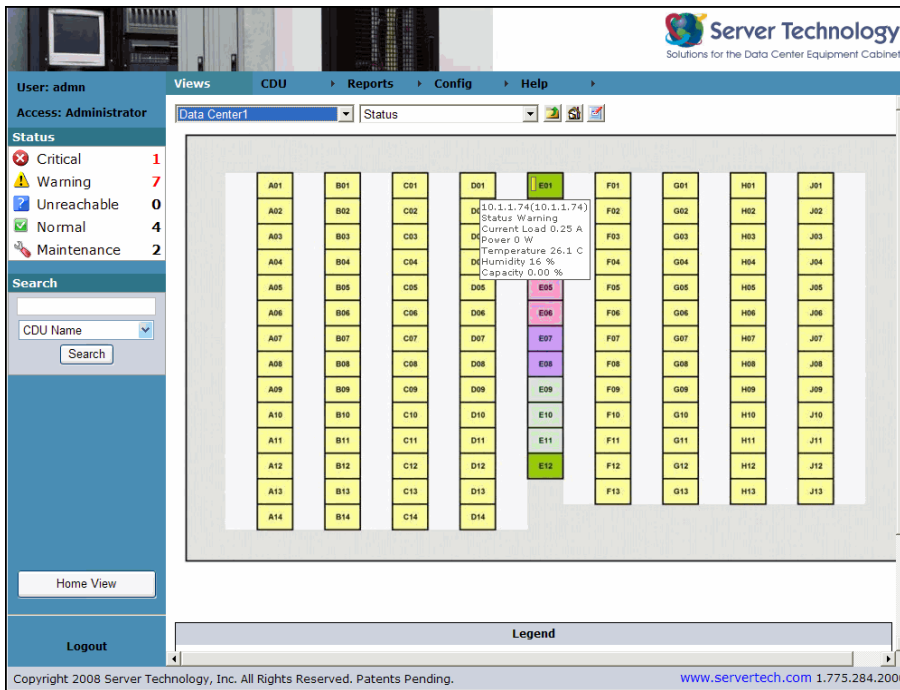
- Cabinet Name: 001\_A
- Status: Normal
- Total Load: N/A
- Total Power: N/A
- Power Density: N/A
- Highest Temperature: N/A
- Capacity Used: 0.00 %

A table below the summary lists the cabinet's operational details:

CDU Name	IP Address	Type	Status	Temp	Humidity	Power	Capacity Used

## The CDU Level

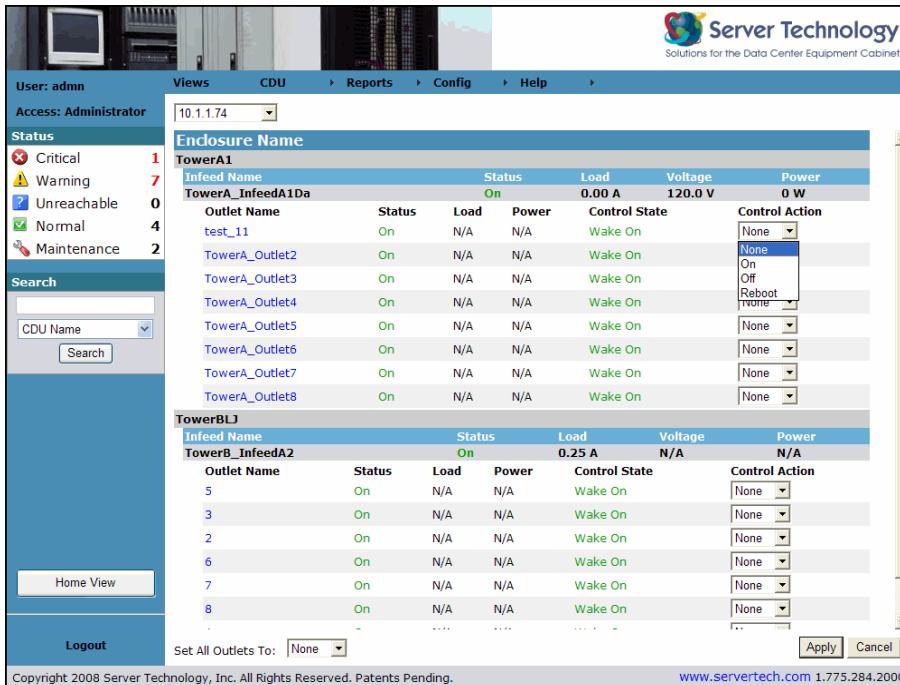
The CDU icon  on a background image represents a specific CDU in your data center. The following example shows a CDU named “10.1.1.74” placed by the administrator on the background image Data Center1:



The screenshot shows the Sentry Power Manager interface. The top navigation bar includes 'Views', 'CDU', 'Reports', 'Config', and 'Help'. The left sidebar shows the user 'adm'n' with Administrator access and a status summary: Critical (1), Warning (7), Unreachable (0), Normal (4), and Maintenance (2). The main area displays a grid of CDU icons labeled A01 through J14. The CDU icon for '10.1.1.74' is highlighted in green, and a tooltip is visible over it showing the following details:

- 10.1.1.74(10.1.1.74)
- Status Warning
- Current Load 0.25 A
- Power 0 W
- Temperature 26.1 C
- Humidity 16 %
- Capacity 0.00 %

Click the CDU icon “10.1.1.74” to drill down to the Enclosure Name page that shows details about the CDU and allows command control for its associated outlets.



The screenshot shows the 'Enclosure Name' page for CDU 10.1.1.74. The page displays a table of outlets with columns for Infeed Name, Status, Load, Power, Voltage, and Power. The table is divided into TowerA and TowerB sections.

Infeed Name	Status	Load	Power	Voltage	Power
TowerA_InfeedA1Da	On	0.00 A	120.0 V	0 W	
Outlet Name	Status	Load	Power	Control State	Control Action
test_11	On	N/A	N/A	Wake On	None
TowerA_Outlet2	On	N/A	N/A	Wake On	None
TowerA_Outlet3	On	N/A	N/A	Wake On	None
TowerA_Outlet4	On	N/A	N/A	Wake On	None
TowerA_Outlet5	On	N/A	N/A	Wake On	None
TowerA_Outlet6	On	N/A	N/A	Wake On	None
TowerA_Outlet7	On	N/A	N/A	Wake On	None
TowerA_Outlet8	On	N/A	N/A	Wake On	None
TowerB_InfeedA2	On	0.25 A	N/A	N/A	N/A
Outlet Name	Status	Load	Power	Control State	Control Action
5	On	N/A	N/A	Wake On	None
3	On	N/A	N/A	Wake On	None
2	On	N/A	N/A	Wake On	None
6	On	N/A	N/A	Wake On	None
7	On	N/A	N/A	Wake On	None
8	On	N/A	N/A	Wake On	None





The Enclosure Name page displays the latest power readings for individual outlet status, load, voltage, power, and control state. The page lets you monitor and control power to individual (or all) outlets displayed for the CDU named.

Outlets are sorted on the page by outlet name under the infeed and enclosure names of the CDU. You can control each of the outlets on a Switched CDU individually by issuing the On, Off, and Reboot control actions. For command information, see *Managing and Controlling Outlets* on page 28.





## **Working with the Icons**

The administrator has the permission level to place location, cabinet, and CDU icons on background images that display on the Views page. The layouts of background maps represent the customized levels of the data center and the current condition of network devices.





### **To Place a Location Icon**

1. Select the menu option **Config > Locations**.
2. From the Location drop-down list, select a background map that you want associated with a specific data center location shown on the Configure Locations page.
3. Click **Apply Changes**.
4. Select the menu option **Views**.
5. From the location drop-down list on the **Views** page, select the background map that you associated with the data center location. The round location icon  displays on the background map. Rolling over the icon identifies the location by name.
6. Click the **Edit/Move** button . All icons on the background map turn light blue.
7. Click and drag the data center location icon to the desired position on the background map.
8. Click the **Save** button  or the **Cancel** button . If saved, the data center location icon appears in its new position on the map, and any other icons on the map change back to their previous colors. If canceled, the map layout will not be changed.




### **To Place a Cabinet Icon**

1. Select the menu option **Config > Cabinets**.
2. From the Location drop-down list, select a location that you want associated with a specific cabinet shown on the Configure Cabinets page.
3. Click **Apply Changes**.
4. Select the menu option **Views**.
5. From the location drop-down list on the **Views** page, select the background map that you associated with the cabinet. The triangle cabinet icon  displays on the background map. Rolling over the icon identifies the cabinet by name.
6. Click the **Edit/Move** button . All icons on the background map turn light blue.
7. Click and drag the cabinet icon to the desired position on the background map.
8. Click the **Save** button  or the **Cancel** button . If saved, the cabinet icon appears in its new position on the map, and any other icons on the map change back to their previous colors. If canceled, the map layout will not be changed.




### To Place a CDU Icon

1. Select the menu option **Config > CDUs > Configure CDUs**.
2. From the Cabinet/Location drop-down list, select a location that you want associated with a specific CDU shown on the Configure CDUs page.
3. Click **Apply Changes**.
4. Select the menu option **Views**.
5. From the location drop-down list on the **Views** page, select the background map that you associated with the CDU. The rectangular CDU icon  displays on the background map. Rolling over the icon identifies the CDU by name.
6. Click the **Edit/Move** button . All icons on the background map turn light blue.
7. Click and drag the CDU icon to the desired position on the background map.
8. Click the **Save** button  or the **Cancel** button . If saved, the CDU icon appears in its new position on the map, and any other icons on the map change back to their previous colors. If canceled, the map layout will not be changed.

### To Move an Icon

1. Select the menu option **Views**.
2. Select the desired map from the drop-down list.
3. Click the **Edit/Move** button . All icons on the map turn light blue.
4. Click and drag the (location, cabinet, or CDU) icon to the desired new location on the map.
5. Click the **Save** button  or the **Cancel** button . If saved, the moved icon appears in its new location and icons on the map change back to their previous colors. If canceled, the map layout is not changed.

### To Delete an Icon

1. Select the menu option **Views**.
2. Select the desired map from the drop-down list.
3. Click the **Edit/Move** button . All icons on the map turn light blue.
4. Click and drag the icon to the desired new location on the map.
5. Click the **Save** button  or the **Cancel** button . If saved, the moved icon appears in its new location and icons on the map change back to their previous colors. If canceled, the map layout is not changed.

## Managing and Controlling Networked CDUs

The CDU menu options provide access to the Sentry Power Manager functions for managing and controlling CDU status:

### CDU Menu Options

Option	Description
Manage	Provides the details about CDUs represented in the Status box in Critical, Warning, Unreachable, Normal, and Maintenance status categories; allows management of the device status categories; and gives access to the Sentry firmware interface to configure the parameters of specific CDUs.
List	Displays a summary list of CDUs (by CDU name) represented in the Status box in Critical, Warning, Unreachable, Normal, and Maintenance status; allows management of the device status categories; and gives access to the Sentry firmware interface to configure the parameters of specific CDUs.
Outlets	Displays the details about individual outlets in networked CDUs and allows outlet control with On, Off, and Reboot commands.
Environmental Monitors	Shows the temperature/humidity status and current thresholds of networked environmental monitors (for view only).
Clusters	Provides a list of outlet names within a specific outlet group (or outlet cluster) and links to individual outlet details (for view only), outlet action commands, and Sentry firmware access.

### The CDU Manage Page

The **CDU > Manage** page lets you gain visibility into network devices by providing the details of CDUs represented in the Status box. CDUs in Critical, Warning, Unreachable, Normal, and Maintenance status categories are displayed.

The screenshot shows the 'CDU Manage' page with the following data:

Status	Count
Critical	1
Warning	3
Unreachable	0
Normal	6
Maintenance	0

Date/Time	Name	IP Address	Reason	Location (Cabinet)	NIC Serial Number	Select
11/12/2008 7:54:39 AM	10.1.6.4	10.1.6.4		No Location (rack1.2.3)	8127579	<input type="checkbox"/>
11/11/2008 3:07:51 PM	10.1.6.3	10.1.6.3		No Location(test 1)	1609592	<input type="checkbox"/>
11/11/2008 3:07:04 PM	66.214.208.132	66.214.208.132	Normal	No Location (rack1.2.3)	8107188	<input type="checkbox"/>
11/11/2008 3:07:01 PM	66.214.208.90	66.214.208.90	Temp High Status	No Location(No Cabinet)	1617121	<input type="checkbox"/>
11/11/2008 3:07:51 PM	10.1.1.21	10.1.1.21	Normal	No Location(test 1)	8104446	<input type="checkbox"/>
11/11/2008 3:07:06 PM	66.214.208.145	66.214.208.145	Normal	No Location(No Cabinet)	8129451	<input type="checkbox"/>
11/11/2008 3:07:02 PM	66.214.208.91	66.214.208.91	Normal	No Location(No Cabinet)	8107189	<input type="checkbox"/>
11/11/2008 3:07:03 PM	66.214.208.92	66.214.208.92	Normal	No Location(No Cabinet)	8010873	<input type="checkbox"/>
11/11/2008 3:07:03 PM	66.214.208.93	66.214.208.93	Normal	No Location(No Cabinet)	1627382	<input type="checkbox"/>
11/11/2008 3:07:03 PM	66.214.208.94	66.214.208.94	Normal	No Location(No Cabinet)	1608113	<input type="checkbox"/>

This page allows management of the device status categories and gives access to the Sentry firmware interface to configure specific CDUs.

Each blue bar on the **CDU > Manage** page represents one of the five status categories that contain reported CDUs requiring your attention and management. The number of CDUs in a category is shown to the far right on the blue bar, for example “6 device(s)”. This number is the same as reported in the Status box in the left pane.

If a status category contains at least one CDU, expand (or collapse) the blue bar by clicking anywhere on the bar.

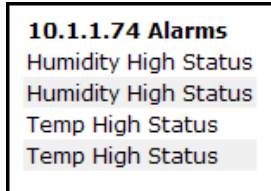


## Column Descriptions

The CDU > Manage columns are described as follows:

- **Date/Time:** Date and time the CDU was reported in the category.
- **Name:** Name of the CDU (user-configured).
- **IP Address:** IP address of the CDU.
- **Reason:** The *first* reported reason causing the CDU status.

The [More...](#) link lists *all* reasons for the status in a popup box:



- **Location (Cabinet):** Name of the background image, such as “California”, followed by the cabinet name in parenthesis, such as “(RJF002)”. Location (Cabinet) is user-configured.
- **NIC Serial No.** The Network Interface Card (NIC) serial number of the CDU.

## Changing the Sort Order

The CDU > Manage page default sort order is ascending by IP address. To choose a different ascending sort order, open the category status row, and click a heading name, such as the “Location (Cabinet)” heading. The lines within the category are resorted. Only open category status rows containing more than one line can be sorted. Multiple open rows can be sorted at one time.

## Managing CDUs in Maintenance

The CDU > Manage page allows control of CDUs in and out of Maintenance.

Normal							4 device(s)
Date/Time	Name	IP Address	Reason	Location (Cabinet)	NIC Serial Number	Select	
1/8/2009 10:31:58 AM	66.214.208.91	66.214.208.91	Normal	No Location(No Cabinet)	8107189	<input type="checkbox"/>	
1/8/2009 10:31:57 AM	66.214.208.92	66.214.208.92	Normal	No Location(No Cabinet)	8010873	<input type="checkbox"/>	
1/5/2009 9:40:54 AM	66.214.208.93	66.214.208.93	Normal	No Location(No Cabinet)	1627382	<input type="checkbox"/>	
1/8/2009 10:31:58 AM	66.214.208.94	66.214.208.94	Normal	No Location(No Cabinet)	1608113	<input type="checkbox"/>	
Maintenance							2 device(s)
Date/Time	Name	IP Address	Reason	Location (Cabinet)	NIC Serial Number	Select	
1/14/2009 1:19:59 PM	10.1.2.130	10.1.2.130	System	No Location(RJF001)	8107088	<input checked="" type="checkbox"/>	
1/14/2009 1:19:59 PM	10.1.2.131	10.1.2.131	System	No Location(RJF001)	1627075	<input type="checkbox"/>	

**To move CDUs to Maintenance:**

1. Check the Select checkbox to the right of one or more CDUs.
2. Select the time period drop the drop-down list for the CDU to remain in Maintenance.
3. Click **Set/Remove Maintenance Mode**. The CDU is moved to Maintenance.

**NOTE:** The CDU remains in Maintenance for the time duration specified and then returns to its previous status category. Manually override the time duration by selecting the “Remove” option.

### To remove CDUs from Maintenance:

1. Check the Select checkbox to the right of one or more CDUs in Maintenance.
2. Select the Remove option from the drop-down list.
3. Click **Set/Remove Maintenance Mode**.

### Displaying a CDU Summary List

The **CDU > List** page displays a summary of CDUs represented in the Status box in Critical, Warning, Unreachable, Normal, and Maintenance status.

Status	Name	IP Address	Status	Location (Cabinet)	NIC Serial Number	Select
Critical	66.214.208.132	66.214.208.132	Warning	California(InfoCrossing-123)	8107188	<input type="checkbox"/>
Warning	10.1.2.133	10.1.2.133	Critical	California(RJF002)	1600001	<input type="checkbox"/>
Unreachable	10.1.2.137	10.1.2.137	Warning	California(RJF002)	1600000	<input type="checkbox"/>
Normal	10.1.2.138	10.1.2.138	Warning	California(RJF002)	8126497	<input type="checkbox"/>
Maintenance	10.1.1.74	10.1.1.74	Warning	Data Center1(No Cabinet)	8115335	<input type="checkbox"/>
	66.214.208.92	66.214.208.92	Normal	No Location(No Cabinet)	8010873	<input type="checkbox"/>
	66.214.208.93	66.214.208.93	Normal	No Location(No Cabinet)	1627382	<input type="checkbox"/>
	66.214.208.94	66.214.208.94	Normal	No Location(No Cabinet)	1608113	<input type="checkbox"/>
	10.1.6.3	10.1.6.3	Warning	No Location(No Cabinet)	1609592	<input type="checkbox"/>
	10.1.6.4	10.1.6.4	Warning	No Location(No Cabinet)	8127579	<input type="checkbox"/>
	66.214.208.90	66.214.208.90	Warning	No Location(No Cabinet)	1617121	<input type="checkbox"/>
	66.214.208.91	66.214.208.91	Normal	No Location(No Cabinet)	8107189	<input type="checkbox"/>
	10.1.2.130	10.1.2.130	Critical	No Location(RJF001)	8107088	<input type="checkbox"/>
	10.1.2.131	10.1.2.131	Maintenance	No Location(RJF001)	1627075	<input type="checkbox"/>

The **CDU > List** page allows quick management of CDU status, provides outlet control commands, and gives you access to the Sentry firmware interface for configuring CDU parameters outside of SPM.

### Managing CDUs in Maintenance

The **CDU > List** page allows control of CDUs in and out of Maintenance.

#### To move CDUs to Maintenance:

1. Check the Select checkbox to the right of one or more CDUs.
2. Select the time period drop the drop-down list for the CDU to remain in Maintenance.
3. Click **Set/Remove Maintenance Mode**. The CDU is moved to Maintenance.

**NOTE:** The CDU remains in Maintenance for the time duration specified and then returns to its previous status category. Manually override the time duration by selecting the “Remove” option.

#### To remove CDUs from Maintenance:

1. Check the Select checkbox to the right of one or more CDUs in Maintenance.
2. Select the Remove option from the drop-down list.
3. Click **Set/Remove Maintenance Mode**.

### Controlling Outlets with SPM:

The **CDU > List** page allows the issuing of On, Off, and Reboot commands for specific outlets from within the Sentry Power Manager interface.

1. Select the menu option **CDU > List**.
2. Click a CDU name under the Name field. The **CDU > Outlets** page displays for the current CDU.
3. For a single outlet (or multiple outlets), select a command from the Control Action drop-down list.
4. Click **Apply**.

---

**NOTE:** The level of your user access rights determines the available outlet commands.

---

### Accessing the Sentry Firmware:

The **CDU > List** page allows direct access to the Sentry CDU firmware interface.

---

**NOTE:** You must know the local user account login to directly access the Sentry CDU firmware interface.

---

1. Select the menu option **CDU > List**.
2. Click a CDU IP address under the IP address field. The Login page for the Sentry firmware displays.
3. Login using your local user account.
4. Use the Sentry firmware interface to configure CDU parameters. For more information, refer to the *Installation and Operations* manual for the CDU product located at [www.servertech.com/support](http://www.servertech.com/support).

## Managing and Controlling Outlets

The **CDU > Outlets** page displays the details about individual outlets in networked CDUs and allows outlet control with On, Off, and Reboot commands.

The screenshot shows the Sentry Power Manager web interface. At the top, it displays the user 'admin' and the current page 'CDU > Outlets'. A status summary on the left shows: Critical (2), Warning (7), Unreachable (0), Normal (4), and Maintenance (1). Below this is a search bar for 'CDU Name'. The main content area is divided into two sections: 'TowerA' and 'TowerB'. Each section has a summary row for 'Infeed Name', 'Status', 'Load', 'Voltage', and 'Power'. Below each summary is a table of individual outlets with columns for 'Outlet Name', 'Status', 'Load', 'Power', 'Control State', and 'Control Action'. At the bottom, there is a 'Set All Outlets To:' dropdown menu set to 'None', and 'Apply' and 'Cancel' buttons.

Infeed Name	Status	Load	Voltage	Power
TowerA_InfeedA	On	0.00 A	120.0 V	0 W

Outlet Name	Status	Load	Power	Control State	Control Action
TowerA_Outlet1	On	N/A	N/A	Wake On	None
TowerA_Outlet2	On	N/A	N/A	Wake On	None
TowerA_Outlet3	On	N/A	N/A	Wake On	None
TowerA_Outlet4	Off	N/A	N/A	Off	None
TowerA_Outlet5	On	N/A	N/A	Wake On	None
TowerA_Outlet6	Off	N/A	N/A	Off	None
TowerA_Outlet7	On	N/A	N/A	Wake On	None
TowerA_Outlet8	Off	N/A	N/A	Off	None

Infeed Name	Status	Load	Voltage	Power
TowerB_InfeedA	On	0.00 A	N/A	N/A

Outlet Name	Status	Load	Power	Control State	Control Action
TowerB_Outlet1	On	N/A	N/A	Wake On	None
TowerB_Outlet2	On	N/A	N/A	Wake On	None
TowerB_Outlet3	On	N/A	N/A	Wake On	None
TowerB_Outlet4	On	N/A	N/A	Wake On	None
TowerB_Outlet5	On	N/A	N/A	Wake On	None
TowerB_Outlet6	On	N/A	N/A	Wake On	None

The **CDUs > Outlets** page displays the latest readings for outlet status, load, voltage, power, and control state, and lets you monitor and control power to individual (or all) outlets displayed for the CDU named at the top of the page.

Outlets are sorted on the page by outlet name under the infeed and enclosure names of the CDU. You can control each of the outlets on a Switched CDU individually by issuing the On, Off, and Reboot control actions.

### Issuing Outlet Commands

The **CDUs > Outlets** page provides the Control Action drop-down for issuing the On, Off, and Reboot commands to individual outlets or all outlets (based on user access rights for outlet control).

#### *To issue a command to a single outlet (or multiple outlets):*

1. Select a command from the Control Action list for each outlet you want to command.
2. Click **Apply**.

#### *To issue a global command to all outlets:*

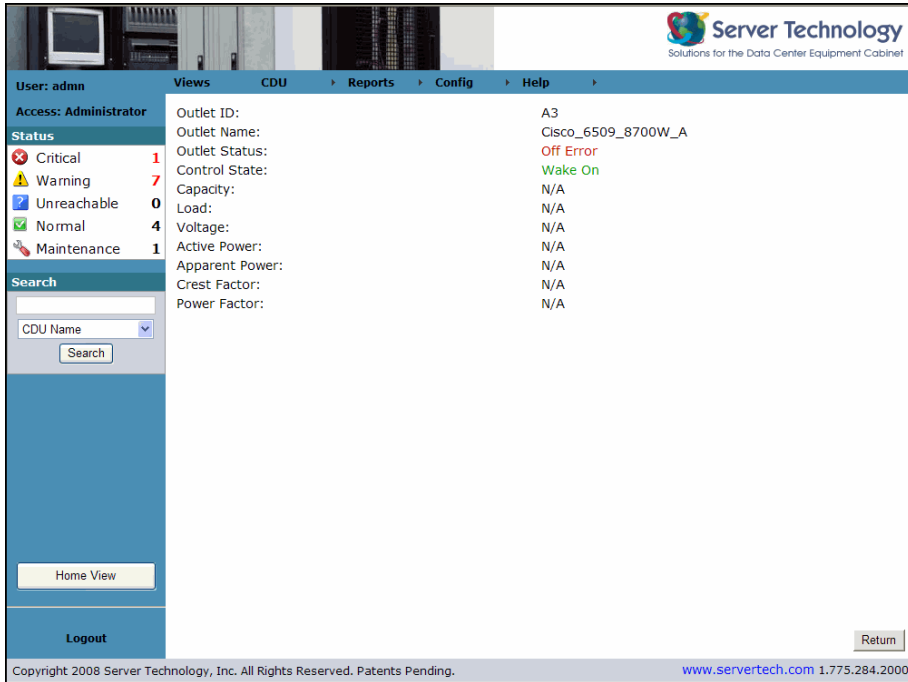
1. Select a command from the “Set All Outlets To” drop-down list at the bottom of the page.
2. Click **Apply**.

#### *To view the outlets in a different CDU:*

Select a different CDU name from the drop-down list at the top of the page.

## Viewing Outlet Details

From the **CDUs > Outlets** page, click an outlet in the Outlet Name field to display outlet details:



The screenshot displays the 'Server Technology' web interface. The top navigation bar includes 'Views', 'CDU', 'Reports', 'Config', and 'Help'. The user is logged in as 'adm'. The main content area shows details for an outlet with ID 'A3' and name 'Cisco\_6509\_8700W\_A'. The outlet status is 'Off Error' and the control state is 'Wake On'. Other metrics like Capacity, Load, Voltage, Active Power, Apparent Power, Crest Factor, and Power Factor are all listed as 'N/A'. On the left, there is a 'Status' summary table and a search section with a 'CDU Name' dropdown and a 'Search' button. At the bottom, there are 'Home View', 'Logout', and 'Return' buttons. The footer contains copyright information for Server Technology, Inc. and the website URL 'www.servertech.com'.

Status	Count
Critical	1
Warning	7
Unreachable	0
Normal	4
Maintenance	1

Outlet ID:	A3
Outlet Name:	Cisco_6509_8700W_A
Outlet Status:	Off Error
Control State:	Wake On
Capacity:	N/A
Load:	N/A
Voltage:	N/A
Active Power:	N/A
Apparent Power:	N/A
Crest Factor:	N/A
Power Factor:	N/A

This view-only page shows detailed data for individual outlets including voltage, Kilowatt power, apparent power, crest factor, and power factor.

To return to the **CDUs > Outlets** page, click **Return**.

## Using Environmental Monitors

The **CDU > Environmental Monitors** display-only page shows reported temperature, humidity, and sensor data about environmental monitors and sensors associated with a specific CDU.

The screenshot displays the 'Environmental Monitors' page in the Server Technology web interface. The interface includes a navigation menu at the top with options like 'Views', 'CDU', 'Reports', 'Config', and 'Help'. A user summary shows 'User: admin' and 'Access: Administrator'. A status summary on the left lists 'Critical' (2), 'Warning' (7), 'Unreachable' (0), 'Normal' (4), and 'Maintenance' (1). A search bar is available for finding specific CDUs. The main content area shows a table of environmental monitors and their sensors.

Environmental Monitor Name				
Environmental_Monitor_A				
Sensor Name	Temp Status	Temperature	Humidity Status	Humidity
Temp_Humid_Sensor_A1	Temp Probe Lost	N/A	Humidity Probe Lost	N/A
Temp_Humid_Sensor_A2	Normal	21.9 C	Normal	22 %
Environmental_Monitor_B				
Sensor Name	Temp Status	Temperature	Humidity Status	Humidity
Temp_Humid_Sensor_B1	Not Found	N/A	Not Found	N/A
Temp_Humid_Sensor_B2	Not Found	N/A	Not Found	N/A

The name of the environmental monitor and related sensor names display on the page in a list sorted by sensor name under monitor name. Current values for the sensor status, temperature, and relative humidity are reported from the devices.

To monitor the values of another environmental monitor, select a different CDU from the drop-down list in the upper left corner of the page.

## Creating SPM Clusters

The **CDUs > Clusters** page is a list of outlet names the administrator has already associated with a specific group or cluster.

The screenshot shows the Sentry Power Manager interface. At the top, there's a navigation bar with 'Views', 'CDU', 'Reports', 'Config', and 'Help'. Below that, the user is logged in as 'admin' with 'Access: Administrator'. A dropdown menu shows 'Motors\_66.214.208.94'. The main content area is titled 'Group or Cluster Name' and shows a table of outlets for 'Motors\_66.214.208.94'. The table has columns for Outlet Name, Load, Power, Status, System Name, and System IP. The outlets listed are Netmodem, R2, and SW1, all with a status of 'On'. On the left side, there's a 'Status' summary showing 2 Critical, 7 Warning, 0 Unreachable, 4 Normal, and 1 Maintenance. Below that is a 'Search' section with a search bar and a 'CDU Name' dropdown. At the bottom, there's a 'Logout' button and a 'Set All Outlets To:' dropdown set to 'On', with 'Apply' and 'Cancel' buttons. The footer contains copyright information and the website URL 'www.servertech.com'.

Outlet Name	Load	Power	Status	System Name	System IP
Netmodem	N/A	N/A	On	66.214.208.94	66.214.208.94
R2	N/A	N/A	On	66.214.208.94	66.214.208.94
SW1	N/A	N/A	On	66.214.208.94	66.214.208.94

The page displays individual outlet details and lets you issue On, Off, and Reboot commands on all outlets in a group or cluster. Outlets can be clustered across multiple discovered CDUs.

An outlet *group* is a collection of outlets on a CDU system (up to two linked enclosures) with a single IP address.

An outlet *cluster* is a collection of outlets across multiple CDU systems with multiple IP addresses.

In the example above, name in the drop-down list may be a group or cluster, depending on whether the administrator configures a single IP address (group) or configures multiple IP addresses (cluster).

Groups and clusters can be configured by:

- Creating new outlet groups and clusters at **Config > Clusters**.
- Adding a group or cluster to a location (where the group or cluster will display on the Views page location image).
- Adding CDUs and power outlets to the group or cluster.

## Controlling Clusters

To display a different cluster, select the cluster name from the drop-down list.

To display operational details and current status for an outlet, click the outlet name.

To connect to the CDU and login to the Sentry firmware interface, click the system IP. Username/password for the HTML interface is required.

To control a specific outlet, click the system name. The Enclosure Name page displays with operational details about individual outlets in networked CDUs and allows outlet control with On, Off, and Reboot commands.

## **Generating SPM Reports and Logs**

The Reports menu provides several options for generating a variety of customized and detailed data reports and system activity logs. Reported data originates directly from the power readings of discovered CDUs in the network.

For networks with Sentry Per Outlet Power Sensing (POPS) units, reports are available to show energy value readings for consumption and usage based on individual outlets, devices, groups/clusters, or the entire data center. For more information about the POPS feature, see [www.servertech.com](http://www.servertech.com)

Reports formats are HTML, XML, Microsoft Word, or Microsoft Excel. You can view reports and logs online or in print.

The following options are available on the Reports menu:

### **Reports Menu Options**

<b>Option</b>	<b>Description</b>
Energy Consumption	<i>For the administrator.</i> Generates total energy consumption reports for outlet and infeed billing levels; reports are available by location, cabinet, CDU, and outlet group/cluster.
Energy Utilization	<i>For the administrator.</i> Generates Power Outlet Power Sensing (POPS) reports from energy value readings to measure and evaluate CDU and group/cluster outlet energy usage and efficiency.
General Reports	Produces several CDU hardware-based reports for inventory, voltage, power, and environment; generates reports by location, cabinet, and combined location/cabinet.
Trends	Generates a graphic trend report on specific variables from current CDU readings over a specified time frame as applicable data is available to be reported. Trend report choices are temperature, humidity, infeed load, infeed power, system watts/unit area, and system total power.
Logs	Branches to options for detailed system activity logs: Discovery, User Login, Use Actions, Alarm Status, and Combined (combines all system activity into one report). The logs (with the exception of Combined) can be used for Email alert.

**NOTE:** To print a report or log, right-click on the displayed report or log and select **Print** or select **File > Print** from your browser window.



## Reporting Energy Consumption

For the administrator: The **Reports > Energy Consumption** option generates total energy consumption reports for outlet and infeed billing levels. You can generate a total energy billing report by day, month, or year based on infeed or outlet data for the reporting period. Reports are available by location, cabinet, CDU, and outlet group/cluster.

The screenshot shows the 'ENTER REPORT PARAMETERS' dialog box in the Server Technology web interface. The dialog contains the following fields and options:

- Report Type: By Day
- Billing Level: Outlet
- Report On: Location
- Location: All Locations (with a dropdown menu showing options: Globe, Nevada, stf, USA48)
- Start Date: 11/6/2008
- End Date: 11/13/2008
- Format: HTML

A 'Generate Report' button is located at the bottom right of the dialog. The background interface shows a navigation menu with 'Reports' selected, and a status summary on the left with the following counts:

- Critical: 1
- Warning: 3
- Unreachable: 0
- Normal: 6
- Maintenance: 0

## Energy Consumption Report Options

Report Parameter	You select...
Report Type	Day, month, or year.
Billing Level	Outlet or infeed.
Reported On	<i>For outlet:</i> location, cabinet, CDU, or group/cluster. A detailed CDU or group/cluster report shows outlet name. <i>For infeed:</i> location, cabinet, or CDU. A detailed CDU report shows infeed name.
Location	Specific location name(s) or all locations.
Start Date/End Date	Desired date range. Default is last week, showing End Date as today's date.
Format	HTML, XML, Microsoft Word, or Microsoft Excel.

## Examples of Energy Consumption Reports

The following examples show a few of the available energy consumption reports:

*Outlet Billing Level – By Location:*

<b>Energy For Locations On Outlet Readings By Day</b>		
Run by admn at 5/8/2009 11:08:06 AM		
Day	Location Name	Total Energy (kWh)
20090505	None	0.00
	Alpha_DCF1_R01	9.70
20090506	None	0.00
	Alpha_DCF1_R01	1696.82
20090507	None	0.00
	Alpha_DCF1_R01	1714.43
20090508	None	0.00
	Alpha_DCF1_R01	1722.64

*Outlet Billing Level – By CDU:*

<b>Energy For CDUs On Outlet Readings By Day</b>		
Run by admn at 5/8/2009 11:11:33 AM		
Day	CDU Name	Total Energy (kWh)
20090505	10.1.2.133	0.00
	66.214.208.134	0.00
	66.214.208.145	9.70
	66.214.208.93	0.00
20090506	10.1.2.133	0.00
	66.214.208.134	0.00
	66.214.208.145	1696.82
	66.214.208.93	0.00
20090507	10.1.2.133	0.00
	66.214.208.134	0.00
	66.214.208.145	1714.43
	66.214.208.93	0.00
20090508	10.1.2.133	0.00
	66.214.208.134	0.00
	66.214.208.145	1722.68
	66.214.208.93	0.00

*Outlet Billing Level – By CDU Detailed:*

<b>Energy For CDUs Detailed On Outlet Readings By Day</b>			
Run by admn at 5/8/2009 11:13:34 AM			
Day	CDU Name	Outlet Name	Total Energy (kWh)
20090505	10.1.2.133	Fuse_Not_Present_AA4	0.00
	10.1.2.133	Fuse_Not_Present_AA6	0.00
	10.1.2.133	Fuse_Not_Present_AB4	0.00
	10.1.2.133	Fuse_Not_Present_AB6	0.00
	10.1.2.133	TowerA_InfeedA_Outlet1	0.00
	10.1.2.133	TowerA_InfeedA_Outlet2	0.00
	10.1.2.133	TowerA_InfeedA_Outlet3	0.00
	10.1.2.133	TowerA_InfeedA_Outlet5	0.00
	10.1.2.133	TowerA_InfeedB_Outlet1	0.00
	10.1.2.133	TowerA_InfeedB_Outlet2	0.00
	10.1.2.133	TowerA_InfeedB_Outlet3	0.00
	10.1.2.133	TowerA_InfeedB_Outlet5	0.00

**NOTE:** The CDU detailed report includes outlet name.

## Reporting Energy Utilization

For the administrator: For networks with Sentry Per Outlet Power Sensing (POPS) units, the **Reports > Energy Utilization** generates several reports from energy value readings to measure and evaluate CDU and group/cluster outlet energy usage and efficiency.

The screenshot shows the Sentry Power Manager web interface. The top navigation bar includes 'Views', 'CDU', 'Reports', 'Config', and 'Help'. The user is logged in as 'adm'n' with 'Administrator' access. On the left, there is a 'Status' section with a list of system states: Critical (0), Warning (3), Unreachable (37), Normal (5), and Maintenance (0). Below this is a search area for 'CDU Name'. The main content area displays the 'ENTER REPORT PARAMETERS' dialog box with the following settings:

- Type: High Usage
- Subtype: All Readings are High
- Report On: Cluster and Group
- Cluster or Group: All Groups and Clusters
- Start Date: 2/9/2009
- End Date: 2/16/2009
- Format: HTML

A 'Generate Report' button is located at the bottom right of the dialog box. The footer of the interface contains the copyright notice: 'Copyright 2008 Server Technology, Inc. All Rights Reserved. Patents Pending.' and the website 'www.servertech.com 1.775.284.2000'.

## Energy Utilization Report Options

Report Parameter	You select...
Type	No usage, low usage, or high usage.
Subtype	Zero for all readings. <i>Subtype is a fixed parameter.</i>
Reported On	CDU or cluster/group.
Location	Specific location name(s) or all locations.
Start Date/End Date	Desired date range. Default is last week, showing End Date as today's date.
Format	HTML, XML, Microsoft Word, or Microsoft Excel.

## Example of Energy Utilization Reports

The following example shows an available energy utilization report:

*No Usage – Reported on CDU – All Low Readings*

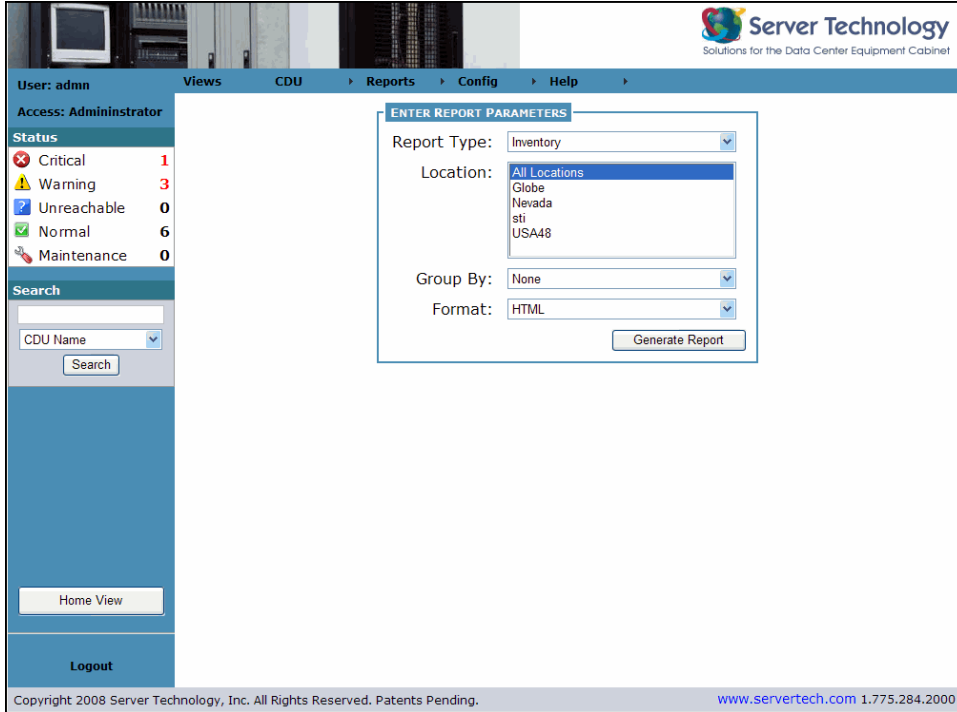
<b>Energy Utilization For CDUs On Outlets With No Power For All Readings</b>		
Run by admn at 5/8/2009 2:30:59 PM		
CDU Name	Outlet Name	Total Energy (kWh)
66.214.208.134		0.00
	Ben	0.00
	kim	0.00
	Mi	0.00
	Ne	0.00
	Tower_Outlet14	0.00
	TowerA_Outlet10	0.00
	TowerA_Outlet11	0.00
	TowerA_Outlet12	0.00
	TowerA_Outlet13	0.00
	TowerA_Outlet15	0.00
	TowerA_Outlet16	0.00
	TowerA_Outlet6	0.00
	TowerA_Outlet7	0.00
	TowerA_Outlet8	0.00
	TowerA_Outlet9	0.00
TowerAPC_Outlet5	0.00	
66.214.208.145		1399.29
	HP-DL380-1-A	0.00
	HP-DL380-2-A	0.00
	HP-DL380-2-B	0.00
	HP-DL380-BI	0.00

*Low Usage – Reported on CDU – At Least One Low Reading*

<b>Energy Utilization For CDUs On Outlets With Low Power For At Least One Reading</b>		
Run by admn at 5/15/2009 10:41:32 AM		
CDU Name	Outlet Name	Total Energy (kWh)
66.214.208.134		0.00
	Ben	0.00
	kim	0.00
	Mi	0.00
	Ne	0.00
	Tower_Outlet14	0.00
	TowerA_Outlet10	0.00
	TowerA_Outlet11	0.00
	TowerA_Outlet12	0.00
	TowerA_Outlet13	0.00
	TowerA_Outlet15	0.00
	TowerA_Outlet16	0.00
	TowerA_Outlet6	0.00
	TowerA_Outlet7	0.00
	TowerA_Outlet8	0.00
	TowerA_Outlet9	0.00
TowerAPC_Outlet5	0.00	
66.214.208.145		14342.23
	HP-DL380-1-A	0.00
	HP-DL380-2-A	0.00
	HP-DL380-2-B	0.00
	HP-DL380-A	5238.03
	HP-DL380-B	5372.76
HP-DL380-BI	0.00	

## Viewing General SPM Reports

The **Reports > General Reports** option produces several report types for inventory, input voltage, input power, power density, and environment.



## General Report Options

Report Parameter	You select...
Type	Inventory, Input Voltage, Input Power, Total Power, Power Density, Environment.
Location	Specific location name(s) or all locations.
Group By	Location, cabinet, location/cabinet, or no grouping.
Format	HTML, XML, Microsoft Word, or Microsoft Excel.

## Example of General Reports

The following examples show some of the general reports available for SPM:

### *Inventory – By Location/Cabinet*

<b>Inventory by Location &amp; Cabinet</b>						
Location	Cabinet	CDU Name	IP Address	Serial Number	Firmware Version	Capacity
None	None	10.1.2.137	10.1.2.137	1600000	Sentry Version 5.3q	0 W
		10.1.2.138	10.1.2.138	8126497	Sentry Switched CDU Version 6.0f	0 W
		66.214.208.132	66.214.208.132	8107188	Sentry Switched CDU Version 6.0g	0 W
		66.214.208.145	66.214.208.145	8129451	Sentry Switched CDU Version 6.0g (Beta 1)	0 W
		66.214.208.90	66.214.208.90	1617121	Sentry Version 5.3q	0 W
		66.214.208.91	66.214.208.91	8107189	Sentry Switched CDU Version 6.0g (Demo 1)	0 W
		66.214.208.92	66.214.208.92	8010873	Sentry Smart CDU Version 6.0g (Demo 1)	0 W
		66.214.208.93	66.214.208.93	1627382	Sentry Version 5.3q (Demo 1)	0 W
		66.214.208.94	66.214.208.94	1608113	Sentry Version 5.3q (Demo 1)	0 W
North Carolina	NETAPP 2345	10.1.2.131	10.1.2.131	1627075	Sentry Version 5.3q	5000 W
Nevada	reno 1	10.1.2.130	10.1.2.130	8107088	Sentry Switched CDU Version 6.0f	1900 W
	reno 2	10.1.2.133	10.1.2.133	1600001	Sentry Version 6.0c (Beta 2)	5000 W

### *Environment – By Location:*

Run by admn at 5/12/2009 1:54:09 PM						
<b>Environment by Location</b>						
Location	CDU Name	Environment Monitor	T1	T2	H1	H2
None	10.1.2.130	Environmental_Monitor_A	N/A	N/A	N/A	N/A
	10.1.2.133	Environmental_Monitor_A	N/A	N/A	N/A	N/A
	10.1.2.133	Environmental_Monitor_B	N/A	N/A	N/A	N/A
	66.214.208.132	Environmental_Monitor_A	23.6°	25.0°	24%	21%
	66.214.208.134	Environmental_Monitor_A	25.5°	25.5°	18%	18%
	66.214.208.145	Environmental_Monitor_A	N/A	24.5°	N/A	22%
	66.214.208.90	Environmental_Monitor_A	25.5°	26.0°	21%	22%
	66.214.208.91	Pepper1	33.6°	26.1°	13%	21%
	66.214.208.92	Environmental_Monitor_A1	N/A	N/A	N/A	N/A
	66.214.208.93	Environmental_Monitor_A1	25.6°	N/A	21%	N/A

Run by admn at 5/12/2009 1:58:16 PM

## Total Power by Cabinet

Cabinet	CDU Name	Total Power
None		
	10.1.2.130	46W
	10.1.2.133	0W
Alpha_DCF1_C0101		
	66.214.208.132	0W
	66.214.208.134	0W
Alpha_DCF1_C0102		
	66.214.208.145	791W
	66.214.208.90	0W
Alpha_DCF1_C0103		
	66.214.208.91	0W
	66.214.208.92	316W
Alpha_DCF1_C0104		
	66.214.208.93	0W
Alpha_DCF1_C0105		
	66.214.208.94	0W

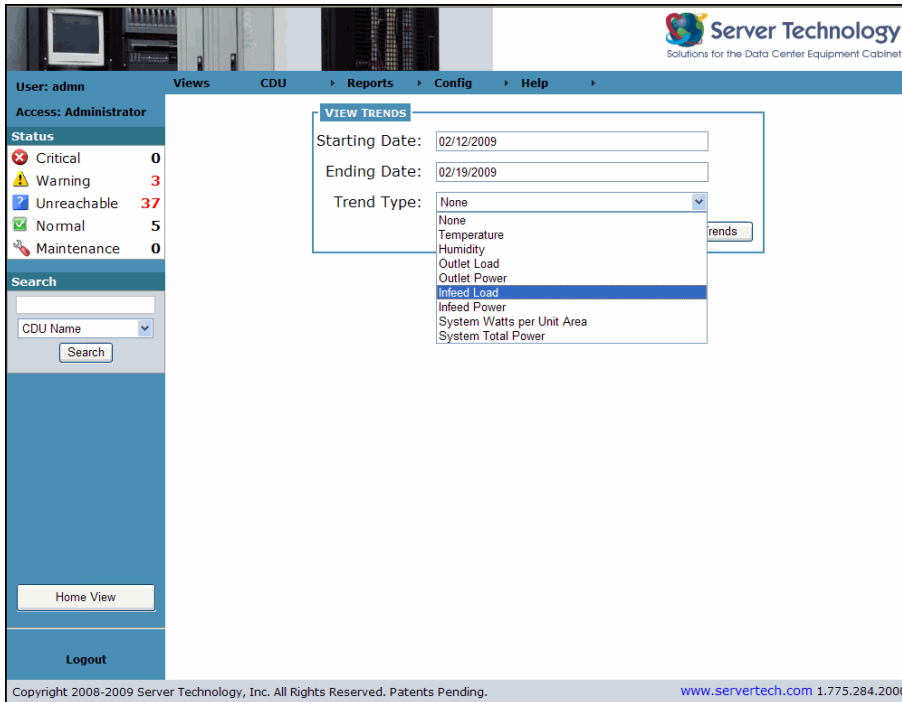
Run by admn at 5/12/2009 2:01:31 PM

## Input Voltage

CDU Name	Enclosure Name	V1	V2	V3
66.214.208.90	LiebeA	N/A		
66.214.208.90	Mir!B	N/A		
66.214.208.91	cdu20046.a	220.0V		
66.214.208.91	cdu20046.b	120.0V		
66.214.208.92	TowerA	208.0V		
66.214.208.92	TowerB	210.0V		
66.214.208.93	TowerA	N/A	N/A	
66.214.208.94	LAB10-01	N/A		
66.214.208.132	TowerA	120.0V		
66.214.208.132	TowerB	120.0V		
66.214.208.134	TowerA	208.0V		
66.214.208.145	POPS-CDU	208.0V	208.0V	208.0V
10.1.2.130	TowerA	120.0V		
10.1.2.133	TowerA	N/A	N/A	
10.1.2.133	TowerB	N/A		

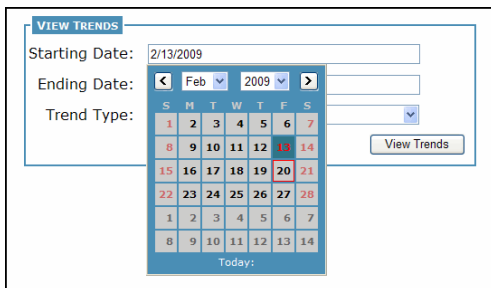
## Generating Graphical Trend Reports

The **Reports > Trends** option uses data collected from current CDU readings and converts the data into graphic charts based on the requested time frame. A trend report can be generated for several parameters during a specified time period, however, only *available* data from CDU readings for the designated parameter and time frame you select will be reported.



The example above shows that Trend reports can be generated over a specified time range for historic reporting of variations in temperature, humidity, outlet (load/power), infeed (load/power), system watts/unit area, and system total power.

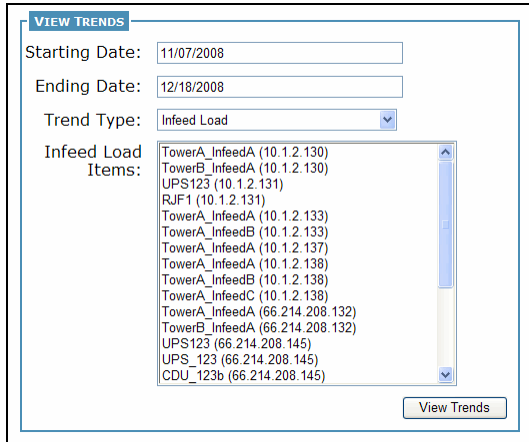
## Running a Trend Report



The Trends page opens with a system-generated default date range for the last seven days with Ending Date as the current date. To change the default date range, roll over the date boxes for a popup calendar, shown above.



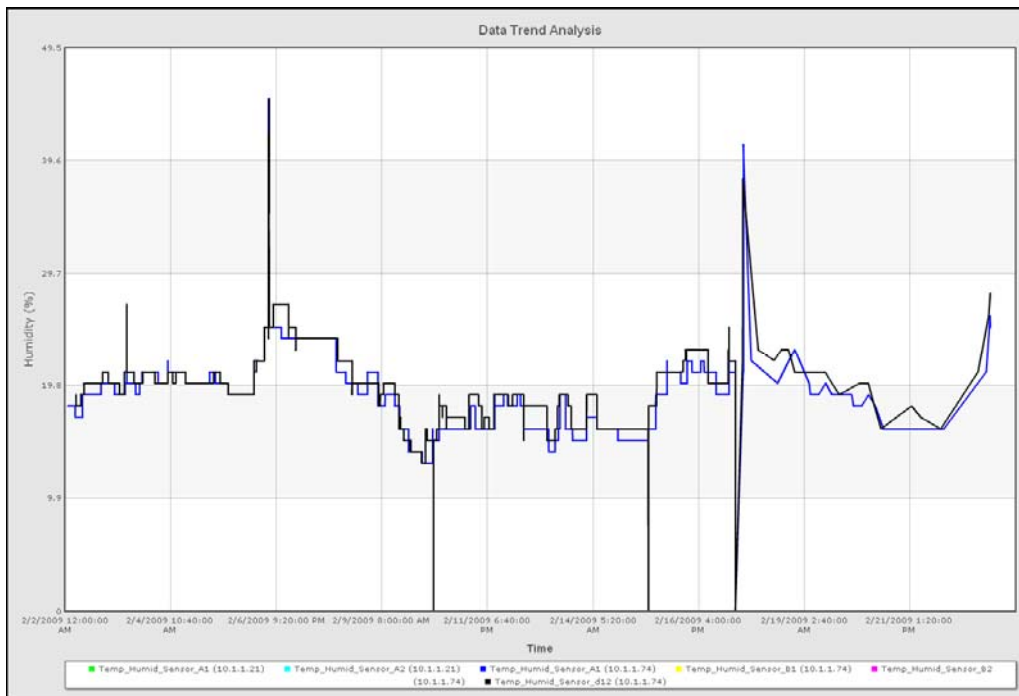
Depending on the type of Trend report you choose (for example, humidity), only the networked devices with measured readings from the CDU for humidity will be collected and displayed in the parameters list box, as shown in the following example. The outcome of the trend report is based on your selection of these parameters.



Select up to 12 CDU-related parameters from the list as follows:

- To select a block of adjacent parameters, click the first item in the block, press and hold down the **Ctrl + Shift** keys, and click the last item in the block.
- To select non-adjacent parameters, click the first item, press and hold down the **Ctrl + Alt** keys, and click each additional item.

To run the trend report for the parameters you selected, click **View Trends**. The report displays in a graphic format, similar to the following sample:



To print the trend report, right-click on the displayed trend report and select **Print Chart**, or select **File > Print** from your browser window.

**NOTE:** The longer the time frame requested for the trend report, the less detail will be available for reporting. In addition, some parameters you select for the trend report may not have available data measured by the CDU for the specified time frame; therefore, those parameters will not be displayed on the trend report.

## Viewing System Activity Logs

The **Reports > Logs** option provides access to specific system activity logs such as alarm status, results of CDU discovery, user actions when using SPM, user login/logout activity, and all SPM system activity combined into a single report.

### Discovery

The Discovery log lists the events that occur during the discovery of individual CDUs and ranges of CDUs in the network. The most current discovery activity displays first.

The screenshot shows the Sentry Power Manager interface. At the top, there is a navigation bar with 'Views', 'CDU', 'Reports', 'Config', and 'Help'. Below this is a status overview section with icons for Critical (0), Warning (3), Unreachable (0), Normal (7), and Maintenance (0). A search bar is present with a 'Search' button. The main area is a table with columns: User Name, IP Address, Event Time, and Description. The table lists several discovery events for various IP addresses. A calendar popup is overlaid on the table, showing the date range from May 5, 2009, to May 12, 2009. At the bottom of the interface, there are date filters for '5/5/2009' and '5/12/2009', a 'Filter' button, and a 'Clear Log' button. The footer contains copyright information for Server Technology, Inc. and the website URL www.servertech.com.

The Discovery log shows IP address, discovery event time, and a detailed description of the discovery event, such as “Discovery process completed for IP 10.1.2.137 though IP 10.1.2.137”.

### Working with the Discovery Log

The Discovery Log opens with a system-generated default date range for the last seven days – Ending Date is current date. To change the default date range, roll over the date boxes for a popup calendar, shown above.

- To filter the log by a specified date range, select the Starting and Ending dates, and click **Filter**.
- To sort the log data by a column heading, click the desired column heading (arranges data in ascending order by heading), or click again (arranges data in descending order by heading).
- The Discovery Log is available for delivery by Email alert. See *Configuring Email Alerts* on page 74.
- To print a report or log, right-click on the displayed report or log and select **Print** or select **File > Print** from your browser window.

### Clearing the Log

*For the administrator:* To delete log data permanently, click **Clear Log**. You are prompted to confirm the deletion.

## Viewing User Login Activity

The **Reports > User Login** option shows all login attempts to SPM. The log is generated by the date range specified, and the most current activity displays first.

User Name	IP Address	Event Time	Description
adm	24.92.220.10	2/20/2009 8:25:13 AM	User successfully logged in
adm	66.214.208.2	2/19/2009 4:19:05 PM	User successfully logged in
adm	66.214.208.2	2/19/2009 3:24:36 PM	User successfully logged in
robert	66.214.208.2	2/19/2009 3:24:30 PM	User logged out
robert	66.214.208.2	2/19/2009 3:24:22 PM	User successfully logged in
adm	66.214.208.2	2/19/2009 3:24:18 PM	User logged out
adm	66.214.208.2	2/19/2009 2:57:22 PM	User successfully logged in
robert	66.214.208.2	2/19/2009 2:29:06 PM	User logged out
robert	66.214.208.2	2/19/2009 2:27:07 PM	User successfully logged in
adm	66.214.208.2	2/19/2009 2:27:03 PM	User logged out
adm	66.214.208.2	2/19/2009 2:26:45 PM	User successfully logged in
adm	66.214.208.2	2/19/2009 1:36:08 PM	User successfully logged in
adm	66.214.208.2	2/19/2009 1:00:29 PM	User successfully logged in
adm	12.189.116.2	2/19/2009 12:10:37 PM	User successfully logged in
adm	66.214.208.2	2/19/2009 11:46:52 AM	User successfully logged in
adm	66.214.208.2	2/19/2009 11:46:06 AM	User successfully logged in
adm	66.214.208.2	2/19/2009 11:32:14 AM	User successfully logged in
adm	204.212.175.36	2/19/2009 11:27:51 AM	User successfully logged in
adm	204.212.175.36	2/19/2009 11:02:23 AM	User successfully logged in
adm	201.116.132.18	2/19/2009 10:35:15 AM	User logged out

The User Login displays the user name, IP address of the CDU affected by login, time of login attempt, and a detailed description of the login.

### *Working with the User Login Log*

The User Login Log opens with a system-generated default date range for the last seven days – Ending Date is current date. To change the default date range, roll over the date boxes for a pop-up calendar, shown above.

- To filter the log by a specified date range, select the Starting and Ending dates, and click **Filter**.
- To sort the log data by a column heading, click the desired column heading (arranges data in ascending order by heading), or click again (arranges data in descending order by heading).
- The User Login is available for delivery by Email alert. See *Configuring Email Alerts* on page 74.

### *Clearing the Log*

- *For the administrator:* To delete log data permanently, click **Clear Log**. You are prompted to confirm the deletion.

## Reviewing User Actions

The **Reports > User Actions** log displays system activity details by specific username. The most current activity displays first, displaying an account of chronological system activity.

The screenshot displays the Sentry Power Manager interface. At the top, the user is identified as 'adm n' and the current page is 'Reports > User Actions'. The interface includes a navigation menu (Views, CDU, Reports, Config, Help) and a status summary on the left showing Critical (0), Warning (8), Unreachable (2), Normal (8), and Maintenance (0) counts. The main area contains a table of log entries with columns for User Name, IP Address, Event Time, and Description. A calendar popup is overlaid on the table, showing the date 2/20/2009. The log entries include details about infeed names, outlet names, and system commands like 'Reboot' issued from various IP addresses.

User Name	IP Address	Event Time	Description
adm n	24.92.220.10	2/20/2009 9:04:50 AM	Infeed name TowerB_InfeedA2 Outlet name 5 Outlet name 3 Outlet name 2 Outlet name 6 Outlet name 7 Outlet name 8 Outlet name 1 Outlet name 4
adm n	24.92.220.10	2/20/2009 9:04:50 AM	Infeed name from[TowerA_InfeedA1Da] to [TowerA_InfeedA1]
adm n	24.92.220.10	2/20/2009 9:04:50 AM	Infeed name from[TowerA_InfeedA1Da] to [TowerA_InfeedA1]Outlet name test_11 Outlet name TowerA_Outlet2 Outlet name TowerA_Outlet3 Outlet name TowerA_Outlet4 Outlet name TowerA_Outlet5 Outlet name TowerA_Outlet6 Outlet name TowerA_Outlet7 Outlet name
adm n	24.92.220.10	2/20/2009 9:04:50 AM	Infeed name: TowerA_InfeedA1; Load High: 6
adm n	24.92.220.10	2/20/2009 8:54:53 AM	Outlet 4 in System 10.1.1.74 at IP 10.1.1.74 issued command: Reboot
adm n	24.92.220.10	2/20/2009 8:54:53 AM	Outlet 1 in System 10.1.1.74 at IP 10.1.1.74 issued command: Reboot
adm n	24.92.220.10	2/20/2009 8:54:53 AM	Outlet 8 in System 10.1.1.74 at IP 10.1.1.74 issued command: Reboot
adm n	24.92.220.10	2/20/2009 8:54:52 AM	Outlet 7 in System 10.1.1.74 at IP 10.1.1.74 issued command: Reboot
adm n	24.92.220.10	2/20/2009 8:54:52 AM	Outlet 6 in System 10.1.1.74 at IP 10.1.1.74 issued command: Reboot
adm n	24.92.220.10	2/20/2009 8:54:52 AM	Outlet 2 in System 10.1.1.74 at IP 10.1.1.74 issued command: Reboot
adm n	24.92.220.10	2/20/2009 8:54:51 AM	Outlet 3 in System 10.1.1.74 at IP 10.1.1.74 issued command: Reboot
adm n	24.92.220.10	2/20/2009 8:54:51 AM	Outlet 5 in System 10.1.1.74 at IP 10.1.1.74 issued command: Reboot
adm n	24.92.220.10	2/20/2009 8:54:51 AM	Outlet TowerA in System 10.1.1.74 at IP 10.1.1.74 issued command: Reboot
adm n	24.92.220.10	2/20/2009 8:54:50 AM	Outlet TowerA in System 10.1.1.74 at IP 10.1.1.74 issued command: Reboot
adm n	24.92.220.10	2/20/2009 8:54:50 AM	Outlet TowerA in System 10.1.1.74 at IP 10.1.1.74 issued command: Reboot
adm n	24.92.220.10	2/20/2009 8:54:49 AM	Outlet TowerA in System 10.1.1.74 at IP 10.1.1.74 issued command: Reboot

The User Actions log shows user name, IP address of the affected CDU, time of system activity, and a detailed description of the activity.

### Working with the User Actions Log

The User Actions Log opens with a system-generated default date range for the last seven days – Ending Date is current date. To change the default date range, roll over the date boxes for a popup calendar, shown above.

- To filter the log by a specified date range, select the Starting and Ending dates, and click **Filter**.
- To sort the log data by a column heading, click the desired column heading (arranges data in ascending order by heading), or click again (arranges data in descending order by heading).
- The User Actions log is available for delivery by Email alert. See *Configuring Email Alerts* on page 74.

### Clearing the Log

- *For the administrator:* To delete log data permanently, click **Clear Log**. You are prompted to confirm the deletion.

## Receiving Alarm Status Notification

The **Reports > Alarm Status** log provides system polling details of CDU status changes within in the predetermined status categories: Critical, Warning, Unreachable, Normal, and Maintenance. The most current activity displays first.

The screenshot displays the 'Alarm Status' log in the Server Technology interface. The top navigation bar includes 'Views', 'CDU', 'Reports', 'Config', and 'Help'. The user is logged in as 'adm'n'. The status summary on the left shows: Critical (0), Warning (8), Unreachable (2), Normal (8), and Maintenance (0). The main table lists log entries with columns for 'User Name', 'IP Address', 'Event Time', and 'Description'. A search box is located on the left side of the table. A calendar popup is overlaid on the bottom right of the table, showing the month of February 2009. The footer contains copyright information for Server Technology, Inc. and the website address www.servertech.com.

The Alarm Status log shows the IP address of the CDU, status event time, and a detailed description of the status change.

### *Working with the Alarm Status Log*

The Alarm Status Log opens with a system-generated default date range for the last seven days – Ending Date is current date. To change the default date range, roll over the date boxes for a popup calendar, shown above.

- To filter the log by a specified date range, select the Starting and Ending dates, and click **Filter**.
- To sort the log data by a column heading, click the desired column heading (arranges data in ascending order by heading), or click again (arranges data in descending order by heading).
- The Alarm Status log is available for delivery by Email alert. See *Configuring Email Alerts* on page 74.

### *Clearing the Log*

- *For the administrator:* To delete log data permanently, click **Clear Log**. You are prompted to confirm the deletion.

## Viewing the Combined Activities Log

The **Reports > Combined** log displays all system activities in Sentry Power Manger as reported by the individual logs (Discovery, User Login, User Actions, and Alarm Status) in one combined report.

The screenshot shows the Sentry Power Manager interface. At the top right is the Server Technology logo. Below it is a navigation bar with 'User: admn', 'Views', 'CDU', 'Reports', 'Config', and 'Help'. The 'Reports' section is active, showing 'Access: Administrator'. On the left, there is a 'Status' summary with icons for Critical (0), Warning (8), Unreachable (2), Normal (8), and Maintenance (0). Below this is a search box with a dropdown for 'CDU Name' and a 'Search' button. The main area is a table with the following columns: User Name, IP Address, Event Time, and Description. The table contains 20 rows of system events, including system polling, user logins, and warnings. At the bottom of the table are navigation links '1 2 3 4 5 6 7 8 9 10'. Below the table is a date range selector showing 'Feb 2009' and a calendar. At the bottom of the interface are 'Home View', 'Logout', and 'Filter' buttons. The footer contains copyright information and the website URL 'www.servertech.com 1.775.284.2000'.

User Name	IP Address	Event Time	Description
System Polling	10.1.5.31	2/23/2009 10:06:01 AM	10.1.5.31(10.1.5.31) removed from warning/critical state
System Polling	10.1.5.31	2/23/2009 10:05:33 AM	10.1.5.31(10.1.5.31) entered warning/critical state
System Polling	10.1.2.138	2/23/2009 9:50:14 AM	10.1.2.138(10.1.2.138) is no longer unreachable
System Polling	10.1.2.138	2/23/2009 9:46:10 AM	10.1.2.138(10.1.2.138) is unreachable
System Polling	10.1.5.31	2/23/2009 9:44:24 AM	10.1.5.31(10.1.5.31) removed from warning/critical state
System Polling	10.1.5.31	2/23/2009 9:44:14 AM	10.1.5.31(10.1.5.31) entered warning/critical state
adm	10.1.6.31	2/23/2009 9:39:34 AM	User successfully logged in
adm	10.1.6.31	2/23/2009 9:39:30 AM	User login failed: Invalid credentials
adm	10.1.6.31	2/23/2009 9:39:26 AM	User login failed: Invalid credentials
adm	10.1.6.31	2/23/2009 9:28:34 AM	User successfully logged in
adm	10.1.6.31	2/23/2009 9:13:26 AM	User successfully logged in
adm	10.1.6.31	2/23/2009 9:13:21 AM	User login failed: Invalid credentials
adm	66.214.208.2	2/23/2009 9:09:09 AM	User successfully logged in
System Polling	10.1.2.138	2/23/2009 8:37:58 AM	10.1.2.138(10.1.2.138) removed from warning/critical state
System Polling	10.1.2.138	2/23/2009 8:37:40 AM	10.1.2.138(10.1.2.138) entered warning/critical state
adm	198.103.223.52	2/23/2009 7:56:58 AM	User successfully logged in
System Polling	10.1.6.4	2/23/2009 5:56:10 AM	10.1.6.4(10.1.6.4) entered warning/critical state
System Polling	10.1.6.3	2/23/2009 5:55:49 AM	10.1.6.3(10.1.6.3) entered warning/critical state
System Polling	10.1.6.3	2/23/2009 5:55:33 AM	10.1.6.3(10.1.6.3) removed from warning/critical state
System Polling	10.1.6.4	2/23/2009 5:55:32 AM	10.1.6.4(10.1.6.4) removed from warning/critical state

The Combined log shows User Name, IP address of the affected CDU, the time of the recorded system event, and a detailed description of the event. The most current activity displays first.

### Working with the Combined Log

The Combined Log opens with a system-generated default date range for the last seven days – Ending Date is current date. To change the default date range, roll over the date boxes for a popup calendar, shown above.

- To filter the log by a specified date range, select the Starting and Ending dates, and click **Filter**.
- To sort the log data by a column heading, click the desired column heading (arranges data in ascending order by heading), or click again (arranges data in descending order by heading).

**NOTE:** The Combined Log is not available for Email alert.

### Clearing the Log

- *For the administrator:* To delete log data permanently, click **Clear Log**. You are prompted to confirm the deletion.

## Configuring Sentry Power Manager

The Configuration menu provides the options necessary for setting up and configuring SPM. The settings you configure in SPM specifically for the CDU, such as names for enclosures, infeeds, and outlets, as well as infeed/outlet load thresholds, are pushed down from SPM directly to the CDU.

The following options are available on the Configuration menu:

### Configuration Menu Options

Option	Description
Locations	Configures and manages default maps and custom images used as the background (on the Views page) where the icons for locations, cabinets, and CDUs are placed.
Cabinets	Adds, edits, and deletes cabinets; specifies cabinet area (in square ft.) for calculation of system wattage; associates a cabinet with a location.
CDUs	Branches to options for specific CDU administrative tasks: CDU discovery, configuration of CDU parameters, and the editing of environmental monitors, sensors, thresholds, enclosures, and outlets; associates a CDU with a cabinet/location.
Clusters	Structures the data center by allowing you to configure a collection of CDU power outlets into named "groups" or "clusters". If SPM discovers a CDU, then the outlets in the CDU are available to be collected into groups or clusters for faster administration. The Clusters option also allows you to grant access rights to the group or cluster for locations, CDUs, and outlets.
Users	Allows administration of individual user names and passwords, associates user with a specific user group, and determines user access rights by user type.
User Groups	Allows administration of user groups and their association with user types, grants permission to user groups for locations, clusters, cabinets, CDUs, and outlets.
LDAP	Configures the detailed parameters for Lightweight Directory Access Protocol (LDAP).
Group Permissions	Grants user group permissions by clusters, locations, cabinets, CDUs, and outlets.
Email	Configures email alerts for specified system activity logs (Discovery Status, User Logins, User Actions, and Alarm Status) to a primary and secondary email address.
Access	Allows configuration of SPM network access parameters for system, network ports, web, Telnet, serial ports, and database.

**NOTE:** The administrator login has full access to all default and custom images and icons. The administrator must grant each user account access to individual background images and icons with the **Config > Users** function.

### About User Types

User types are the levels of access rights to SPM as granted by the administrator to users and user groups. The following user types are recognized by SPM:

#### User Types

Type	Description
Admin	Administrative. Full access for all configuration, control (On, Off, Reboot), status, and serial/pass-thru ports. At SPM installation, the default administrative user is the <b>adm</b> n user account. (Note there is no "i" in the <b>adm</b> n user account name/password.) The <b>adm</b> n user may grant full administrative access level rights to other users. See Note below.
Regular User	Partial access for control (On, Off, Reboot), status, and pass-thru of assigned outlets, groups, clusters, and serial/pass-thru ports.
View Only	Partial access for status and pass-thru of assigned outlets, groups, clusters, and serial/pass-thru ports.
Reboot Only	Partial access for control (Reboot), status, and pass-thru of assigned outlets, groups, clusters, and serial/pass-thru ports.

**NOTE:** For security, it is recommended that you first use the default **adm**n user account to grant access rights to another administrative user account. Then using the new administrative account, change (or delete) the default **adm**n user account. The default **adm**n account cannot be demoted or deleted until you have already granted administrative access rights to another user account.



## Establishing Location Images

The **Config > Locations** page allows the administrator to configure and manage default maps and custom images which are then displayed on the Views page as backgrounds for device icons.

The screenshot shows the 'Config > Locations' page in the Server Technology web interface. The page has a blue header with the user 'admin' and navigation links for Views, CDU, Reports, Config, and Help. On the left, there's a status summary showing 0 Critical, 8 Warning, 2 Unreachable, 8 Normal, and 0 Maintenance. Below that is a search bar for CDU Name. The main area features a table of location images with columns for Use, Name, Image, Act. Cap., Theor. Cap., Location, and Delete. An 'ADD NEW LOCATION' dialog box is open, allowing the user to enter a Name, Actual Capacity, Theoretical Capacity, and Filename (with a 'Browse...' button). The table lists various location images like Australia, City, Continental USA, DC\_Floor, Globe, Nevada, New York, Alabama, Alaska, and Arizona, each with a 'Use' checkbox, 'Image' field, and capacity fields. At the bottom, there are 'Apply Changes' and 'Cancel' buttons, and a copyright notice for Server Technology, Inc.

Location images include the default world maps and USA state maps (as shown above) that are installed with SPM. In addition, backgrounds can include any custom images the administrator uploads to SPM after installation.

Acceptable graphic file formats are JPG, PNG, or GIF. The maximum graphics file size must be less than 800 pixels wide. The screen resolution determines the height of the displayed graphic.

Any default or custom image can be accessed by the administrator to provide the working background pictures displayed on the Views page where icons are placed to represent actual data center locations, cabinets, and CDUs.

The levels of the data center in location images can range from global maps to detailed images, depending on how the administrator decides to represent the data center. Later, icons representing actual data center locations, cabinets, and CDUs are positioned on the location images.

## Capacity Fields

Fields	Description
Actual Capacity	User-defined value to show the maximum capacity of the sum of the infeed circuits; for example, 2 x L630P – 208V * 30A*2= 12,480W.
Theoretical Capacity	User-defined value to show the desired “safety rating” of the sum of the infeed circuits, 20% in this example: 2 x L630P – 208V*30A*2*.8= 9,984W.

## Adding a New Location Image

1. Select the menu option **Config > Locations**.
2. Type a **Name** for the image (required).
3. (Optional). Type a numeric value in the Actual Capacity field.
4. (Optional). Type a numeric value in the Theoretical Capacity field.
5. Click **Browse** to locate the desired image; once selected the **Filename** field populates with the pathname of the image.
6. Click **Add**. The message “Location Image Uploaded” displays and the new image is added by name to the drop-down location list on the Views page. The image is also added to the **Config > Locations** page and shows a checkmark in the Use checkbox.



### Disabling a Location Image

1. Select the menu option **Config > Locations**.
2. Uncheck the Use checkbox next to the image name you want to disable and click **Apply Changes**. The disabled image remains in SPM (to be enabled later, if desired) but the image does not appear in the drop-down list on the Views Page.


### Enabling a Location Image

1. Select the menu option **Config > Locations**.
2. Check the Use checkbox next to the image name you want to enable, and click **Apply Changes**. The enabled image appears in the drop-down list on the Views Page.

### Editing a Location Image Name

1. Select the menu option **Config > Locations**.
2. Type over the name of an image in the Name field and click **Apply Changes**. The edited image name appears in the drop-down list on the Views Page.

### Viewing a Location Image Thumbnail

1. Select the menu option **Config > Locations**.
2. Roll over the square button  to the right of an image name to view a thumbnail of the image.

### Deleting a Location Image

1. Select the menu option **Config > Locations**.
2. Check the Delete checkbox to the far right of the image name you want to delete and click **Apply Changes**. The image is permanently removed from SPM.

---

**NOTE:** Only empty background images can be deleted. If a background image contains at least one location, cabinet, or CDU, the Delete checkbox is not available.

---

### Changing a Location Image

1. Select the menu option **Config > Locations**.
2. Click the **Browse** button (under the Image heading) to the right of the location name you want to change.
3. Select a new image. The new file pathname appears in the Image field.
4. Type over the name shown in the Name field (if you want to change the name).
5. Select the desired location for the new image from the Location drop-down list.

---

**NOTE:** Changing a location image is a delete-add shortcut that allows an image simply to be replaced with another image.

---

## Configuring Data Center Cabinets

The **Config > Cabinets** page allows the administrator to configure and manage cabinets.

The screenshot displays the 'Config > Cabinets' page in the Server Technology web interface. The interface includes a navigation menu (Views, CDU, Reports, Config, Help), a user profile (User: admn, Access: Administrator), and a status summary (Critical: 0, Warning: 3, Unreachable: 37, Normal: 5, Maintenance: 0). A search bar is available for finding cabinets by name. The main area shows a table of cabinets with columns for Name, Area (Sq. Ft.), Actual Capacity, Theoretical Capacity, Location, and Delete. An 'ADD NEW CABINET' dialog box is open, allowing the user to enter details for a new cabinet, including Name, Area (sq. ft.), Actual Capacity, Theoretical Capacity, and Location (set to None). The 'Add' button is visible in the dialog. At the bottom, there are 'Apply Changes' and 'Cancel' buttons, and a footer with copyright information and the website URL (www.servertech.com).

Name	Area (Sq. Ft.)	Actual Capacity	Theoretical Capacity	Location	Delete
252.14	20			North Carolina	
252.15	0			Temp	
253.05	20			None	<input type="checkbox"/>
3_NW_75	2	2	2	North Carolina	<input type="checkbox"/>
301_45	8	4000	5000	temp	
SW_2_24	3	3	3	None	<input type="checkbox"/>

The **Config > Cabinets** page allows the adding, editing, and deleting of cabinets. In addition, cabinets can be associated with locations. When a cabinet is added and associated with a location, the cabinet icon appears on the Views page.

The area of the cabinet (for the calculation of total system watts) and capacity planning data for the cabinet (actual capacity and theoretical capacity) can be configured.

### Capacity Fields

Fields	Description
Actual Capacity	User-defined value to show the maximum capacity of the sum of the infeed circuits; for example, 2 x L630P – 208V * 30A*2= 12,480W.
Theoretical Capacity	User-defined value to show the desired “safety rating” of the sum of the infeed circuits, 20% in this example: 2 x L630P – 208V*30A*2*.8= 9,984W.

## Adding a New Cabinet

1. Select the menu option **Config > Cabinets**.
2. In the Name field, type a name for the new cabinet. (Required).
3. In the Area field, type a numeric value (in square ft.). Use whole numbers only – no fractions.
4. (Optional). Type a numeric value in the Actual Capacity field.
5. (Optional). Type a numeric value in the Theoretical Capacity field.
6. From the Location drop-down list, select a location where the cabinet will be placed.
7. Click **Add**. The new cabinet is added to the list on the Cabinets page and also displays on the Views page under the location specified (unless you selected “None” for the location).

---

**NOTE:** The “None” Location disassociates a cabinet from all location images but keeps the cabinet available in SPM.

---

## Editing a Cabinet

1. Select the menu option **Config > Cabinets**.
2. In the list of cabinets, for one or more cabinets, type over the Name, Area, Actual Capacity, Theoretical Capacity, and Location as you want to update these fields. The Area field is sq. ft. and must be a whole number.
3. Click **Apply Changes**. The edits to the cabinet(s) are applied throughout SPM.

## Deleting a Cabinet

1. Select the menu option **Config > Cabinets**.
2. In the list of cabinets, for a single cabinet (or multiple cabinets), check the Delete checkbox.
3. Click **Apply Changes**. A confirmation message displays. If confirmed, the cabinet is removed from SPM.

---

**NOTE:** Only empty cabinets can be deleted. If a cabinet contains one or more CDUs, the Delete checkbox is not available.

---

## Managing CDUs

The **Config > CDUs** option branches to additional options for CDU administrative tasks: discovery of CDUs, adding and configuring CDUs, and configuring environmental monitors, sensors, enclosures, and outlets.

### Discover CDUs

The Discover CDUs option allows the administrator to define parameters for CDU manual discovery as SPM searches multiple subnets for SNMP-enabled CDUs. This option also allows editing of CDU name, SNMP GET/SET community string, and CDU capacity.

The screenshot shows the Sentry Power Manager web interface. The top navigation bar includes 'Views', 'CDU', 'Reports', 'Config', and 'Help'. The user is logged in as 'adm'. On the left, there is a 'Status' section with a table:

Status	Count
Critical	1
Warning	3
Unreachable	0
Normal	6
Maintenance	0

Below the status section is a 'Search' area with a text input field and a 'Search' button. At the bottom of the left sidebar are 'Home View' and 'Logout' buttons. The main content area is titled 'SETUP A DISCOVERY' and contains the following fields:

- Discovery Starting IP Address: [ ] [ ] [ ] [ ]
- Discovery Ending IP Address: [ ] [ ] [ ] [ ]
- SNMP GET Community String: public
- SNMP SET Community String: private
- FTP User Name: admn
- FTP Password: admn

At the bottom of the form are two buttons: 'Initiate CDU Discovery' and 'Cancel CDU Discovery'. The footer of the page contains the copyright information: 'Copyright 2008 Server Technology, Inc. All Rights Reserved. Patents Pending.' and the website URL: 'www.servertech.com 1.775.284.2000'.

Use the Discovery feature for the initial discovery of CDUs when SPM is installed, and then to discover new CDUs as they are installed in the network. Discovered CDUs communicate with SPM to report alarms and CDU status changes to assist in global management of your network.

#### *About the FTP Fields*

SPM uses the FTP configuration of the CDU to obtain CDU group information for discovery. Therefore, the FTP User Name and FTP Password fields (the valid administrative user name and password used for direct access of the CDU through the Sentry interface), are required on the Setup a Discovery page as shown in the example above.

#### *List of Discovered CDUs*

Discovered CDUs appear in a list at the bottom of the Discovery page in alphabetic order by CDU name (default is IP address).

The Discovery feature has the capability to discover a CDU with its single IP address or to discover multiple CDUs in a range of IP addresses.

---

**NOTE:** The Discovery function is executed immediately upon request and cannot be scheduled.

---

## Discovery Process Setup

### *To discover a single CDU:*

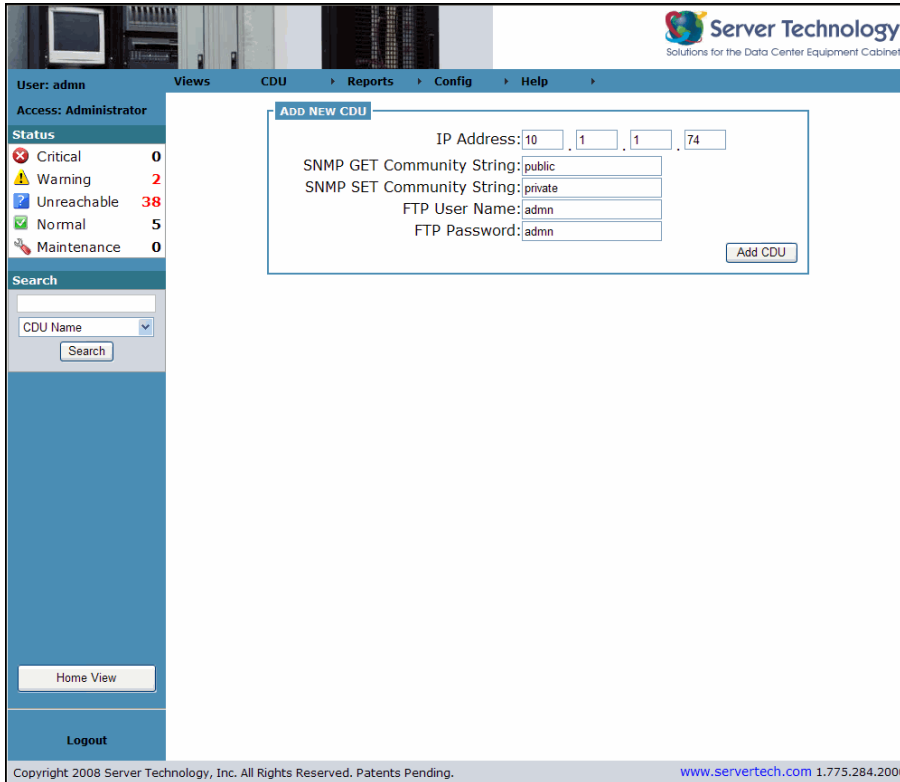
1. Select the menu option **Config > CDUs > Discover CDUs**.
2. Type the Discovery Starting IP Address in the box provided. Be sure to type IP address, not a hostname.
3. In the Discovery End Subnet Value box, type the last node of the starting IP address. For example, if the starting IP address typed is 10.1.1.74, then type “74” in the Discovery End Subnet Value box. The Discovery feature will search, discover, and connect only the one CDU specifically named 10.1.1.74.
4. Type the SNMP community string from the SNMP settings on the CDU in the network. The community string is used during the discovery process.
5. In the FTP User Name and FTP Password fields, type the valid administrative user name and password used for direct access of the CDU through the Sentry product’s firmware interface. Note that the FTP fields may not be the same as your administrative user name and password for login to SPM.
6. Click **Initiate CDU Discovery** to perform an immediate discovery on the single CDU.

### *To discover multiple CDUs:*

1. Select the menu option **Config > CDUs > Discover CDUs**.
2. Type the Discovery Starting IP Address in the box provided. Be sure to type IP address, not a hostname.
3. In the Discovery End Subnet Value box, type the IP address of the last CDU you want discovered. For example, if the starting IP address typed is 10.1.1.74, and the Discovery End Subnet Value is 10.1.1.125, then the Discovery feature will search, discover, and connect all CDU names in the range between the IP addresses 10.1.1.74 and 10.1.1.125.
4. Type the SNMP community string from the SNMP settings on the CDU in the network. The community string is used during the discovery process.
5. In the FTP User Name and FTP Password fields, type the valid administrative user name and password you use for direct access of the CDU through the Sentry product’s firmware interface. Note that the FTP fields may not be the same as your administrative user name and password for login to SPM.
6. Click **Initiate CDU Discovery** to perform an immediate discovery on the range of CDUs specified.

## Add CDU

The **Config > CDUs > Add CDU** option directs SPM to discover one CDU at a time by the exact IP address of the CDU.



The screenshot displays the Sentry Power Manager web interface. The top navigation bar includes 'Views', 'CDU', 'Reports', 'Config', and 'Help'. The left sidebar shows the user 'admin' with 'Administrator' access, a status summary (Critical: 0, Warning: 2, Unreachable: 38, Normal: 5, Maintenance: 0), a search box, and a 'Home View' button. The main content area is titled 'ADD NEW CDU' and contains the following form fields:

- IP Address: 10 . 1 . 1 . 74
- SNMP GET Community String: public
- SNMP SET Community String: private
- FTP User Name: admin
- FTP Password: admin

An 'Add CDU' button is located at the bottom right of the form. The footer contains the copyright notice 'Copyright 2008 Server Technology, Inc. All Rights Reserved. Patents Pending.' and the website 'www.servertech.com 1.775.284.2000'.

Use the Add New CDU page for convenience to discover a single CDU in the SPM network by entering the IP address of the CDU, such as 10.1.1.74 shown in the example above.

This page works the same way in the discovery process as the **Config > CDUs > Discover CDUs** page, but only discovers one IP address at a time. The Add New CDU page can be a quick and convenient way (after bulk discovery of CDUs by IP address range) to add and discover a single CDU or a few CDUs by exact IP address.

### ***About the FTP fields:***

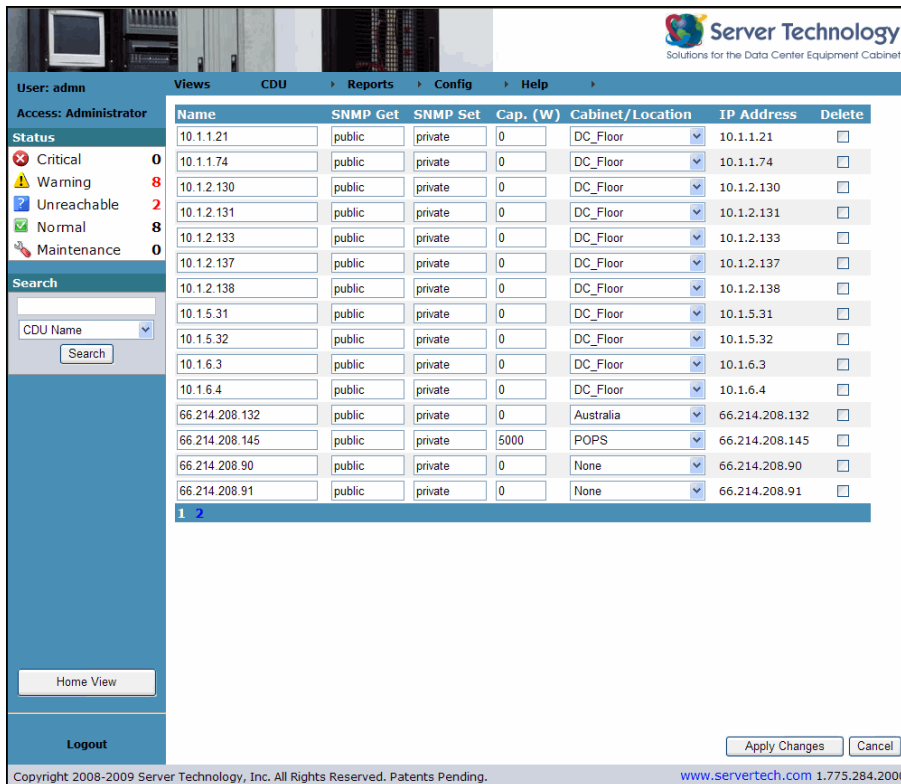
SPM uses the FTP configuration of the CDU to obtain CDU group information for discovery. Therefore, the FTP User Name and FTP Password fields (the valid administrative user name and password used for direct access of the CDU through the Sentry interface), are required on the Setup a Discovery page as shown in the example above.

### ***To add a single CDU:***

1. Type the exact IP address of the new CDU.
2. Provide the SNMP community string from the SNMP settings on the CDU in the network. The community string is used during the discovery process.
3. Type the FTP User Name/Password.
4. Click **Add CDU**.

## Configuring CDUs

The **Config > CDUs > Configure CDUs** option allows the administrator to edit the detailed parameters of discovered CDUs in the network.



Name	SNMP Get	SNMP Set	Cap. (W)	Cabinet/Location	IP Address	Delete
10.1.1.21	public	private	0	DC_Floor	10.1.1.21	<input type="checkbox"/>
10.1.1.74	public	private	0	DC_Floor	10.1.1.74	<input type="checkbox"/>
10.1.2.130	public	private	0	DC_Floor	10.1.2.130	<input type="checkbox"/>
10.1.2.131	public	private	0	DC_Floor	10.1.2.131	<input type="checkbox"/>
10.1.2.133	public	private	0	DC_Floor	10.1.2.133	<input type="checkbox"/>
10.1.2.137	public	private	0	DC_Floor	10.1.2.137	<input type="checkbox"/>
10.1.2.138	public	private	0	DC_Floor	10.1.2.138	<input type="checkbox"/>
10.1.5.31	public	private	0	DC_Floor	10.1.5.31	<input type="checkbox"/>
10.1.5.32	public	private	0	DC_Floor	10.1.5.32	<input type="checkbox"/>
10.1.6.3	public	private	0	DC_Floor	10.1.6.3	<input type="checkbox"/>
10.1.6.4	public	private	0	DC_Floor	10.1.6.4	<input type="checkbox"/>
66.214.208.132	public	private	0	Australia	66.214.208.132	<input type="checkbox"/>
66.214.208.145	public	private	5000	POPS	66.214.208.145	<input type="checkbox"/>
66.214.208.90	public	private	0	None	66.214.208.90	<input type="checkbox"/>
66.214.208.91	public	private	0	None	66.214.208.91	<input type="checkbox"/>

The Configure CDUs page lists the current settings of discovered CDUs and shows the associated cabinet and location. All configured settings on this page are pushed directly down to the CDU. This page allows CDUs to be deleted.

### *Configure CDU parameters:*

1. Edit values or select values from the drop-down list for a single CDU (or multiple CDUs).
2. Click **Apply Changes**.

**NOTE:** The CDU capacity is measured by a numeric watts value.

### *Delete a CDU:*

1. Check the Delete checkbox for a single CDU (or multiple CDUs) to be deleted.
2. Click **Apply Changes**.

## Setting Environmental Monitors

The **Config > CDUs > Environmental Monitors** option lets the administrator edit the names of environmental monitors and sensors, and set the sensor high/low thresholds for temperature/humidity.

The screenshot shows the Sentry Power Manager web interface. At the top right is the Server Technology logo with the tagline "Solutions for the Data Center Equipment Cabinet". The navigation bar includes "User: admn", "Views", "CDU", "Reports", "Config", and "Help". Below the navigation bar, the "Access: Administrator" section shows the IP address "66.214.208.132". A "Status" sidebar on the left lists: Critical (1), Warning (3), Unreachable (0), Normal (6), and Maintenance (0). Below the status sidebar is a "Search" section with a "CDU Name" dropdown and a "Search" button. The main content area is titled "Environmental Monitor Name" and contains a table with the following data:

Sensor Name	Temp Low (C)	Temp High (C)	Humidity Low (%)	Humidity High (%)
Environmental_Monitor_A				
Temp_Humid_Sensor_A1	0	123	0	10
Temp_Humid_Sensor_A2	0	123	0	10

At the bottom of the interface are "Apply Changes" and "Cancel" buttons, and a footer with "Copyright 2008 Server Technology, Inc. All Rights Reserved. Patents Pending." and "www.servertech.com 1.775.284.2000".

High/low sensor temperature thresholds are measured in degrees Celsius; high/low sensor humidity thresholds are measured in percentage.

### *Configure Environmental Monitor Name, Sensor Name, or Sensor Values:*

1. Select a CDU from the drop-down list.
2. Edit the environmental monitor name, sensor name, temperature value, and humidity value as necessary.
3. Click **Apply Changes**.



## Editing Enclosures, Infeeds, and Outlets

The **Config > CDUs > Enclosures** option allows the administrator to edit the names of the individual components of a CDU: enclosures, infeeds, and outlets. The option also allows configuration of load threshold (in amperes) and low/high power limit (in watts).

The screenshot displays the Sentry Power Manager web interface. At the top, the user is identified as 'admin' and the current CDU is '66.214.208.93'. The navigation menu includes 'Views', 'CDU', 'Reports', 'Config', and 'Help'. On the left, a status summary shows: Critical (0), Warning (3), Unreachable (37), Normal (5), and Maintenance (0). Below this is a search bar for 'CDU Name' and a 'Home View' button. The main content area is titled 'Enclosure Name' and shows two sections: 'TowerA' and 'TowerB'. Each section has an 'Infeed Name' field and a table of outlets. The 'TowerA' section has 8 outlets, and the 'TowerB' section has 7 outlets. Each outlet table has columns for 'Outlet Index', 'Outlet Name', 'Load (A) Threshold', 'Low (W) Power Limit', and 'High (W) Power Limit'. The values for these columns are consistent across all outlets in both sections. At the bottom right, there are 'Apply' and 'Cancel' buttons. The footer contains copyright information for Server Technology, Inc. and the website URL 'www.servertech.com'.

An enclosure is a Sentry unit (made up of infeeds and outlets) that is part of an overall Sentry CDU. In the example above, the Sentry Switched CDU 66.214.208.93 is made up of the following units:

- A Switched master unit named TowerA. The TowerA unit is the first enclosure with an infeed named TowerA\_InfeedA. TowerA\_InfeedA has several related outlets, starting with TowerA\_InfeedA\_Outlet1 and so on.
- A Switched extension unit named TowerB. TowerB is the second enclosure with an infeed named TowerB\_InfeedA. TowerB\_InfeedA has several related outlets, starting with TowerA\_InfeedB\_Outlet1 and so on.

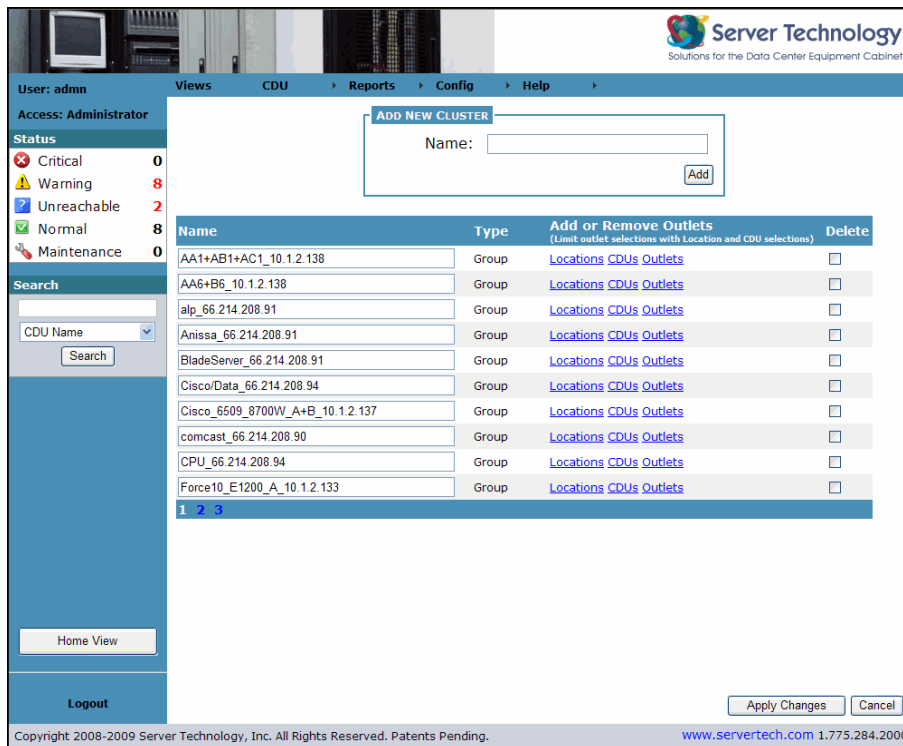
Both the master and extension units are considered two separate enclosures in the single Sentry CDU named 66.214.208.93.

### To configure enclosure settings:

1. Select a CDU from the drop-down list.
2. Edit the names for enclosure, infeed, and outlet, and type over the numeric value for enclosure power load (in amperes), as necessary.
3. Click **Apply**.

## Arranging Outlet Groups and Clusters

The **Config > Clusters** option allows the administrator to structure the data center by configuring collections of CDU power outlets into named groups or clusters. As long as SPM has discovered a CDU in the network, outlets can be gathered into groups or clusters.



The screenshot shows the Server Technology web interface. At the top right is the logo for Server Technology, Solutions for the Data Center Equipment Cabinet. The navigation bar includes 'User: admn', 'Views', 'CDU', 'Reports', 'Config', and 'Help'. On the left, there is a sidebar with 'Access: Administrator', a 'Status' section showing counts for Critical (0), Warning (8), Unreachable (2), Normal (8), and Maintenance (0), and a 'Search' section with a 'CDU Name' dropdown and a 'Search' button. The main content area features an 'ADD NEW CLUSTER' dialog box with a 'Name:' input field and an 'Add' button. Below the dialog is a table of existing outlet groups.

Name	Type	Add or Remove Outlets (Limit outlet selections with Location and CDU selections)	Delete
AA1+AB1+AC1_10.1.2.138	Group	<a href="#">Locations</a> <a href="#">CDUs</a> <a href="#">Outlets</a>	<input type="checkbox"/>
AA6+B6_10.1.2.138	Group	<a href="#">Locations</a> <a href="#">CDUs</a> <a href="#">Outlets</a>	<input type="checkbox"/>
alp_66.214.208.91	Group	<a href="#">Locations</a> <a href="#">CDUs</a> <a href="#">Outlets</a>	<input type="checkbox"/>
Anissa_66.214.208.91	Group	<a href="#">Locations</a> <a href="#">CDUs</a> <a href="#">Outlets</a>	<input type="checkbox"/>
BladeServer_66.214.208.91	Group	<a href="#">Locations</a> <a href="#">CDUs</a> <a href="#">Outlets</a>	<input type="checkbox"/>
Cisco/Data_66.214.208.94	Group	<a href="#">Locations</a> <a href="#">CDUs</a> <a href="#">Outlets</a>	<input type="checkbox"/>
Cisco_6509_8700W_A+B_10.1.2.137	Group	<a href="#">Locations</a> <a href="#">CDUs</a> <a href="#">Outlets</a>	<input type="checkbox"/>
comcast_66.214.208.90	Group	<a href="#">Locations</a> <a href="#">CDUs</a> <a href="#">Outlets</a>	<input type="checkbox"/>
CPU_66.214.208.94	Group	<a href="#">Locations</a> <a href="#">CDUs</a> <a href="#">Outlets</a>	<input type="checkbox"/>
Force10_E1200_A_10.1.2.133	Group	<a href="#">Locations</a> <a href="#">CDUs</a> <a href="#">Outlets</a>	<input type="checkbox"/>

At the bottom of the table are page numbers '1 2 3'. Below the table are 'Apply Changes' and 'Cancel' buttons. The footer contains copyright information for 2008-2009 Server Technology, Inc. and the website URL www.servertech.com 1.775.284.2000.

An outlet *group* is a collection of outlets on a CDU system (up to two linked enclosures) with a single IP address.

An outlet *cluster* is a collection of outlets across multiple CDU systems with multiple IP addresses.

In the example above, the Type field displays “Group” or “Cluster”, depending on whether the administrator configures a single IP address (group) or configures multiple IP addresses (cluster).

Groups and clusters can be configured by:

- Creating new outlet groups and clusters.
- Adding a group or cluster to a location (where the group or cluster will display on the Views page background image).
- Adding CDUs and power outlets to the group or cluster.

**NOTE:** The Type field is determined by the outlet configuration of the CDU, either “Group” or “Cluster” depending on the configuration of physical outlets in the CDU – either a single IP address (Group), or multiple IP addresses (Cluster).

### Add a Group or Cluster

1. Select the menu option **Config > Clusters**.
2. In the Add New Cluster box, type the new outlet group name or cluster name.
3. Click the **Add** button.

A successful add message displays and the new group or cluster name appears on the list in the Name column.

**NOTE:** When a new group or cluster is added, by default the Type name displays “Group”. For the Type name to change to “Cluster”, you must assign outlets across multiple CDU systems (multiple linked enclosures) with multiple IP addresses.

### Edit a Group or Cluster

1. Type over the names for the group/cluster.
2. Click **Apply Changes**.

### Delete a Group or Cluster

1. Check the Delete checkbox for a single CDU or multiple CDUs to be deleted.
2. Click **Apply Changes**.

### Add a Location to a Group or Cluster

1. From the Add New Cluster page, click the Locations link for the desired group/cluster. The Locations window displays:



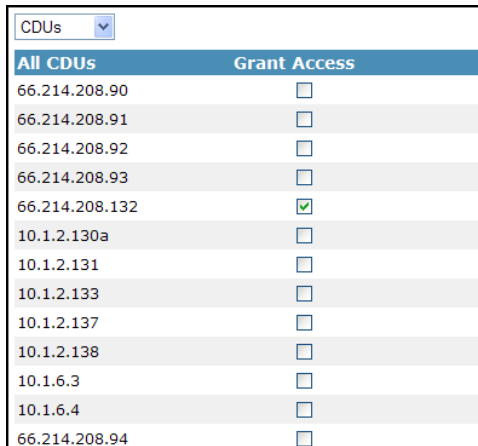
The screenshot shows a window titled "Locations" with a dropdown menu set to "Cisco/Data\_66.214.208.94". Below the title bar is a table with two columns: "All Locations" and "Grant Access". The table lists various geographical locations, each with a checkbox in the "Grant Access" column. The following table represents the data shown in the screenshot:

All Locations	Grant Access
Australia	<input type="checkbox"/>
Continental USA	<input checked="" type="checkbox"/>
Alabama	<input type="checkbox"/>
California	<input type="checkbox"/>
Data Center1	<input checked="" type="checkbox"/>
Arizona	<input checked="" type="checkbox"/>
Arkansas	<input type="checkbox"/>
Central America	<input type="checkbox"/>
Colorado	<input type="checkbox"/>
Connecticut	<input type="checkbox"/>
Delaware	<input type="checkbox"/>
District of Columbia	<input type="checkbox"/>
Florida	<input type="checkbox"/>
Georgia	<input type="checkbox"/>
Hawaii	<input type="checkbox"/>
Idaho	<input type="checkbox"/>
Illinois	<input type="checkbox"/>

2. Check the location checkboxes to add the group or cluster named at the top of the window to the location(s) shown. To remove the group or cluster from the location, uncheck the checkboxes.
3. Click **Apply Changes**.
4. To return to the Add New Cluster page, click **Return**.

### Add a CDU to a Group or Cluster

1. From the Add New Cluster page, click the CDUs link for the desired group/cluster. The CDUS window displays:



The screenshot shows a window titled "CDUs" with a dropdown menu set to "Cisco/Data\_66.214.208.94". Below the title bar is a table with two columns: "All CDUs" and "Grant Access". The table lists various IP addresses, each with a checkbox in the "Grant Access" column. The following table represents the data shown in the screenshot:

All CDUs	Grant Access
66.214.208.90	<input type="checkbox"/>
66.214.208.91	<input type="checkbox"/>
66.214.208.92	<input type="checkbox"/>
66.214.208.93	<input type="checkbox"/>
66.214.208.132	<input checked="" type="checkbox"/>
10.1.2.130a	<input type="checkbox"/>
10.1.2.131	<input type="checkbox"/>
10.1.2.133	<input type="checkbox"/>
10.1.2.137	<input type="checkbox"/>
10.1.2.138	<input type="checkbox"/>
10.1.6.3	<input type="checkbox"/>
10.1.6.4	<input type="checkbox"/>
66.214.208.94	<input type="checkbox"/>

2. Check the CDU checkboxes to add the group or cluster to the CDU(s) shown. To remove the group or cluster from the CDU, uncheck the checkboxes.
3. Click **Apply Changes**.
4. To return to the Add New Cluster page, click **Return**.

## Add an Outlet to a Group or Cluster

1. From the Add New Cluster page, click the Outlets link for the desired group/cluster. The Outlets window displays:

Outlets	Motors_66.214.208.94
All Outlets	Grant Access
66.214.208.94::R1	<input type="checkbox"/>
66.214.208.94::R2	<input checked="" type="checkbox"/>
66.214.208.94::SW1	<input checked="" type="checkbox"/>
66.214.208.94::Netmodem	<input checked="" type="checkbox"/>

2. Check the Outlet checkboxes to add the group or cluster to the outlet(s) shown. To remove the group or cluster from the outlets, uncheck the checkboxes.
3. Click **Apply Changes**.
4. To return to the Add New Cluster page, click **Return**.

## Configuring SPM Users

The **Config > Users** option allows the administrator to configure and maintain the parameters of SPM users. Multiple SPM users can be logged in concurrently.

The screenshot displays the SPM Users configuration interface. The top navigation bar includes 'Views', 'CDU', 'Reports', 'Config', and 'Help'. The left sidebar shows the user's status (Administrator) and a search bar. The main content area features a modal window for adding or changing users, and a table of existing users.

Name	User Group	Delete
adm	adm	
faulkner	User_Regular	<input type="checkbox"/>
john	User_Reboot	<input type="checkbox"/>
marc	adm	<input type="checkbox"/>
robert	User_View	<input type="checkbox"/>

The Users page allows maintenance of users, user passwords, and user group assignments.

### Adding a new user:

1. Select the menu option **Config > Users**.
2. Type the new user's name, password, password confirmation, and select a user group from the drop-down menu. Password is case-sensitive; strong passwords are supported by SPM but are not required.
3. Click **Add/Change**. The new user name and associated user group appear on the page.

### Changing a username:

1. Select the menu option **Config > Users**.
2. Type over the user's name in the Name field.
3. Click **Apply Changes**. The user name is changed.

### Changing a user's password:

1. Select the menu option **Config > Users**.
2. Type the user's name, a new password, and password confirmation. Password is case-sensitive; strong passwords are supported by SPM but are not required.
3. Click **Add/Change**. The user's password is changed.

### Deleting a user:

1. Select the menu option **Config > Users**.
2. Check the Delete checkbox next to the user's name you want to delete.
3. Click **Apply Changes**. You are prompted to confirm the deletion. If confirmed, the user is deleted from SPM.

### Changing a user's group:

1. Select the menu option **Config > Users**.
2. From the drop-down list next to the user's name, select a different user group.
3. Click **Apply Changes**. The user group association is changed.

## About User Group Security

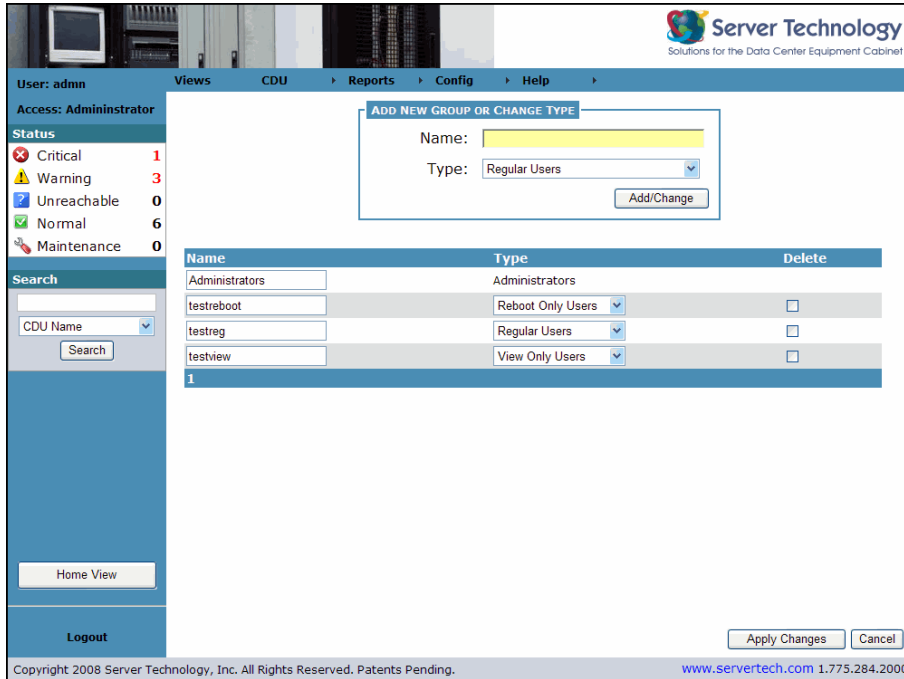
SPM has a user and user group system that provides access to internal components such as CDUs, locations, and outlet groups/clusters. System security is defined at the user group level, and a user is assigned only one user group by the SPM administrator.

In addition to the user group levels, the user group can have another attribute that determines direct access to the SPM components: This attribute determines an admin user, regular user, reboot only user, or view only user. Admin level users have full access; the view only user can see the devices but cannot control them.

In addition, SPM can define LDAP user groups. If a user is a member of a specific LDAP user group, the user can be defined outside of SPM and be associated with the external LDAP user group.

## Configuring SPM User Groups

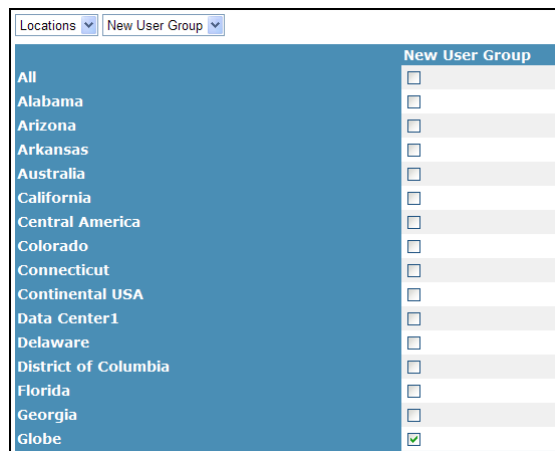
The **Config > User Groups** option allows the administrator to configure and maintain the parameters of SPM user groups and assign user group permissions for clusters, locations, cabinets, CDUs, and outlets.



The User Groups page allows configuration and maintenance of user groups, user group passwords, and the assignment of user groups to *user type* categories (admin, reboot-only, regular, and view-only). This page also allows the administrator to assign permissions to user groups for clusters, locations, cabinets, CDUs, and outlets.

### Adding a New User Group:

1. Select the menu option **Config > User Groups**.
2. Type the new user group name and select a user type from the drop-down menu.
3. Click **Apply Changes**. The new user group is added to the **Config > User Groups** page, and the User Permissions page for Locations is displayed:



4. Check the appropriate checkboxes to set locations for the new user group, and click **Apply Changes**.

- From the drop-down list select Clusters, Cabinets, CDUs, or Outlets and check the appropriate checkboxes to assign access rights for the user group to

The screenshot shows the Server Technology web interface. The user is logged in as 'adm'. The navigation menu includes Views, CDU, Reports, Config, and Help. The 'Config' menu is expanded to show 'All User Groups'. A table lists various user groups with checkboxes for access rights. The table has columns for 'All User Groups limited', 'Reno Reboot', 'Test', and 'very\_limited'. The user groups listed include Clusters, Locations, Cabinets, CDUs, and Outlets, with specific IP addresses and names like 'Sidecar 10 Cab' through 'Sidecar 18 Cab'.

User Group	All User Groups limited	Reno Reboot	Test	very_limited
All User Groups limited	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
10.1.2.133	<input checked="" type="checkbox"/>			
66.214.208.145	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>
66.214.208.90	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>
66.214.208.91	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>
66.214.208.92	<input type="checkbox"/>			<input type="checkbox"/>
66.214.208.93	<input checked="" type="checkbox"/>			
66.214.208.94	<input checked="" type="checkbox"/>			
Sidecar 10 Cab 250.13	<input checked="" type="checkbox"/>			<input type="checkbox"/>
Sidecar 11 Cab 250.14	<input checked="" type="checkbox"/>			<input type="checkbox"/>
Sidecar 12 Cab 250.15	<input type="checkbox"/>			<input type="checkbox"/>
Sidecar 15 Cab 251.06	<input type="checkbox"/>			<input type="checkbox"/>
Sidecar 16 Cab 251.07	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Sidecar 17 Cab 251.08	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Sidecar 18 Cab 251.09	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

### Changing a User Group Name:

- Select the menu option **Config > User Groups**.
- Type over the user group name in the Name field.
- Click **Apply Changes**. The user group name is changed (user type and access rights to devices are not affected).

### Deleting a User Group:

- Check the Delete checkbox next to the user group name you want to delete.
- Click **Apply Changes**. You are prompted to confirm the deletion. If confirmed, the user group is deleted from SPM.

### Changing the User Type (Access Rights Level):

- Do one of the following:
  - From the Type drop-down list next to the user group name, select a different user type, and click **Apply Changes**.
  - Type the user group name in the Name field (top of page), select a different user from the Type drop-down list (top of page), and click **Add/Change**.



## User Types

User types are the levels of access rights to SPM as granted by the administrator to users and user groups. The following user types are recognized by SPM:

### User Types

---

Type	Description
Admin	Administrative. Full access for all configuration, control (On, Off, Reboot), status, and serial/pass-thru ports. At SPM installation, the default administrative user is the <b>adm</b> n user account. (Note there is no "i" in the <b>adm</b> n user account name.) The <b>adm</b> n user may grant full administrative access level rights to other users. See Note below.
Regular User	Partial access for control (On, Off, Reboot), status, and pass-thru of assigned outlets, groups, clusters, and serial/pass-thru ports.
View Only	Partial access for status and pass-thru of assigned outlets, groups, clusters, and serial/pass-thru ports.
Reboot Only	Partial access for control (Reboot), status, and pass-thru of assigned outlets, groups, clusters, and serial/pass-thru ports.

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**NOTE:** For security, it is recommended that you use the default **adm**n user account to grant access rights to another administrative user account. Then using the new administrative account, change (or delete) the default **adm**n user account. The **adm**n account cannot be demoted or deleted until you have already granted administrative access rights to another user account.

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## Determining LDAP Settings

The **Config > LDAP** page allows the administrator to configure the settings required to enable SPM's support for Lightweight Directory Access Protocol (LDAP).

The LDAP support enables authentication with LDAP servers so that user accounts do not need to be individually created locally on each Sentry CDU.

SPM administrators can pre-define and configure – in each Sentry product and in the LDAP server – a set of necessary LDAP groups, and access rights for each group. The user's access rights can then be granted or denied simply by making the user a member of one or more pre-defined Sentry LDAP Groups. User accounts can be added, deleted, or changed in the LDAP server without any changes needed on individual Sentry CDUs.

Sentry CDU support for LDAP has been tested in the following environments:

- Microsoft Active Directory (MSAD)
- Novell eDirectory (eDir)

### Enabling or disabling LDAP support:

Select **Enabled** or **Disabled** from the LDAP drop-down menu and click **Apply**.

### Setting the LDAP server address:

Type the IP addresses (or hostnames) in the Primary and/or Secondary Host fields and click **Apply**.

### Changing the LDAP server port:

Type the server port number in the Port field and press **Apply**.

### Enabling or disabling LDAP over TLS/SSL:

Select **Yes** or **No** from the Use TLS/SSL drop-down menu and click **Apply**.

---

**NOTE:** If LDAP over TLS/SSL is enabled, MD5 binding is disabled.

---

### Setting the LDAP bind type:

Select **Simple** or **MD5** from the Bind Type drop-down menu and click **Apply**.

---

**NOTE:** If MD5 binding is enabled, LDAP over TLS/SSL is disabled.

---

### Setting the search bind Distinguished Name (DN):

Type the fully-qualified distinguished name (FQDN) in the Search Bind DN field and click **Apply**.

**Setting the search bind password for Distinguished Name (DN):**

Type the Search Bind Password in the Search Bind Password field and click **Apply**.

**Setting the user search base Distinguished Name (DN):**

Type the User Search Base DN in the User Search Base DN field and click **Apply**.

**Setting the user search filter:**

Type the User Search Filter in the User Search Filter field and click **Apply**.

**Setting the group membership attribute:**

Type the group membership attribute in the Group Membership Attribute Field and click **Apply**.

**Setting the group membership value type:**

Select **DN** or **Name** from the Group Membership Attribute drop-down menu and click **Apply**.

**Configuring the authentication order:**

Select **Remote->Local** or **Remote Only** from the drop-down menu and click **Apply**.

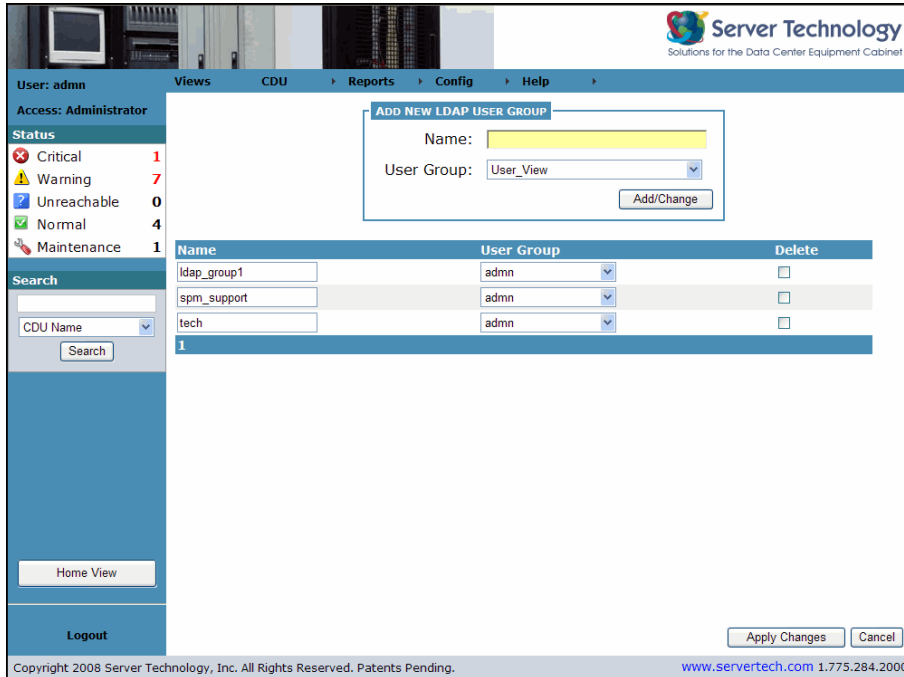
---

**NOTE:** Server Technology recommends NOT setting the authentication order to Remote Only until the LDAP has been fully configured and tested.

---

## LDAP User Groups

The **User Groups** link allows the administrator to configure the settings required to establish SPM users in LDAP group membership. From the **Config > LDAP** page, click the **User Groups** link:



The screenshot shows the Server Technology web interface. The top navigation bar includes 'Views', 'CDU', 'Reports', 'Config', and 'Help'. The user is logged in as 'admin'. The left sidebar shows the 'Access: Administrator' status and a search bar. The main content area displays the 'ADD NEW LDAP USER GROUP' modal window, which has a 'Name' field and a 'User Group' dropdown menu set to 'User\_View'. Below the modal is a table of existing LDAP user groups:

Name	User Group	Delete
ldap_group1	adm	<input type="checkbox"/>
spm_support	adm	<input type="checkbox"/>
tech	adm	<input type="checkbox"/>

At the bottom of the page, there are 'Apply Changes' and 'Cancel' buttons, and a copyright notice for Server Technology, Inc. 2008.

The LDAP User Groups page allows complete LDAP user group maintenance: new user groups added, user group names changed, user groups deleted, user group assignment (admin users, reboot-only users, regular users, and view-only users), and user group assignment changed.

### Adding a new LDAP user group:

1. Select the menu option **Config > LDAP** and click the User Groups link.
2. Type the new LDAP user group name in the Name field and select a user group association from the User Group drop-down menu.
3. Click **Apply Changes**. The new LDAP user group is added to the **Config > User Groups** page under the Name heading and the user group association is shown under the User Group heading.

### Changing an LDAP user group name:

1. Select the menu option **Config > LDAP** and click the User Groups link.
2. Type over the LDAP user group name in the Name field.
3. Click **Apply Changes**. The LDAP user group name is changed.

### Deleting an LDAP user group:

1. Select the menu option **Config > LDAP** and click the User Groups link.
2. Check the Delete checkbox next to the LDAP user group name you want to delete.
3. Click **Apply Changes**. You are prompted to confirm the deletion. If confirmed, the LDAP user group is deleted from SPM.

### Changing an LDAP user group association:

1. Select the menu option **Config > LDAP** and click the User Groups link.
2. From the drop-down list next to the user group name, select a different user type.
3. Click **Apply Changes**. The LDAP user group association is changed.

## Setting Group Permissions

The **Config > Group Permissions** option branches to other choices for viewing and editing specific user group permissions for clusters, locations, cabinets, CDUs, and outlets.

### Clusters

The **Config > Group Permissions > Clusters** page displays current cluster names and user group names for viewing and assigning user group permission to clusters.

The screenshot shows the 'Clusters' page in the Server Technology web interface. The page title is 'Clusters' and the breadcrumb is 'Config > Group Permissions > Clusters'. The interface includes a navigation menu with 'Views', 'CDU', 'Reports', 'Config', and 'Help'. A status summary on the left shows: Critical (3), Warning (6), Unreachable (0), Normal (4), and Maintenance (0). A search bar is present with a 'Search' button. The main content area is a table with columns: 'All User Groups', 'Floor 2', 'User\_Reboot', 'User\_Regular', and 'User\_View'. A dropdown menu is open over the 'All User Groups' column, showing options: 'All User Groups', 'Floor 2', 'User\_Reboot', 'User\_Regular', and 'User\_View'. The table lists clusters with their corresponding IP addresses and permission checkboxes. The 'InfoCrossing' cluster has checkboxes checked for 'User\_Reboot', 'User\_Regular', and 'User\_View'. At the bottom, there are 'Apply Changes' and 'Cancel' buttons.

Cluster Name	All User Groups	Floor 2	User_Reboot	User_Regular	User_View
All	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cisco/Data	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CPU_66.214.208.94	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Force10_E1200_A_10.1.2.133	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
InfoCrossing	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
LJK Test 1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LJK Test 2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Motors_66.214.208.94	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
test2_66.214.208.90	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tower-A_66.214.208.91	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tower-B_66.214.208.91	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Woot_66.214.208.90	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
X4-CORE1_66.214.208.91	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

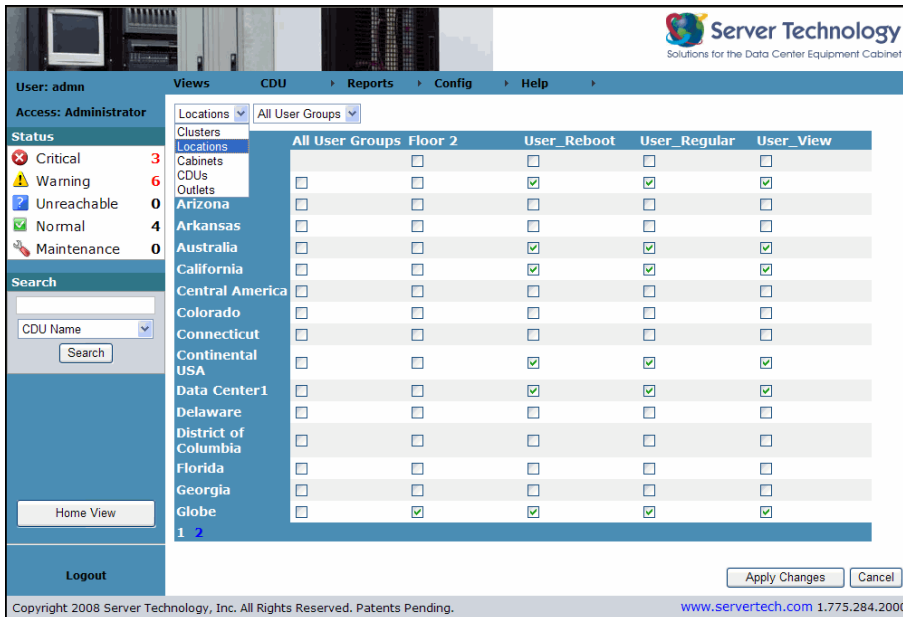
### Assigning user group permissions to clusters:

1. Select the menu option **Config > Group Permissions > Clusters**.
2. Select Clusters from the drop-down list.
3. To grant permissions, check the corresponding checkboxes between individual cluster names (on the left) and individual user group names (at the top).
  - To deny permissions, clear the checkboxes as necessary.
  - To view and assign permissions for a specific user group, select the user group name from the pull-down list.
4. Click **Apply Changes**. User group permissions for clusters are updated.

**NOTE:** To assign permissions to all user groups for a single cluster or multiple clusters, check the All User Groups checkbox.

## Setting Permissions for Locations

The **Config > Group Permissions > Locations** page displays current location names and user group names for viewing and assigning user group permission to locations.



The screenshot shows the 'Locations' page in the Sentry Power Manager web interface. The page is titled 'Locations' and is part of the 'Config > Group Permissions' section. The interface includes a navigation menu, a status summary, a search box, and a table for assigning permissions to various locations.

**Status Summary:**

Status	Count
Critical	3
Warning	6
Unreachable	0
Normal	4
Maintenance	0

**Search:** CDU Name [Search]

**Locations Table:**

Locations	All User Groups	Floor 2	User_Reboot	User_Regular	User_View
Cabinets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CDUs	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Outlets	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Arizona	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Arkansas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Australia	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
California	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Central America	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Colorado	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Connecticut	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Continental USA	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Data Center1	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Delaware	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
District of Columbia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Florida	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Georgia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Globe	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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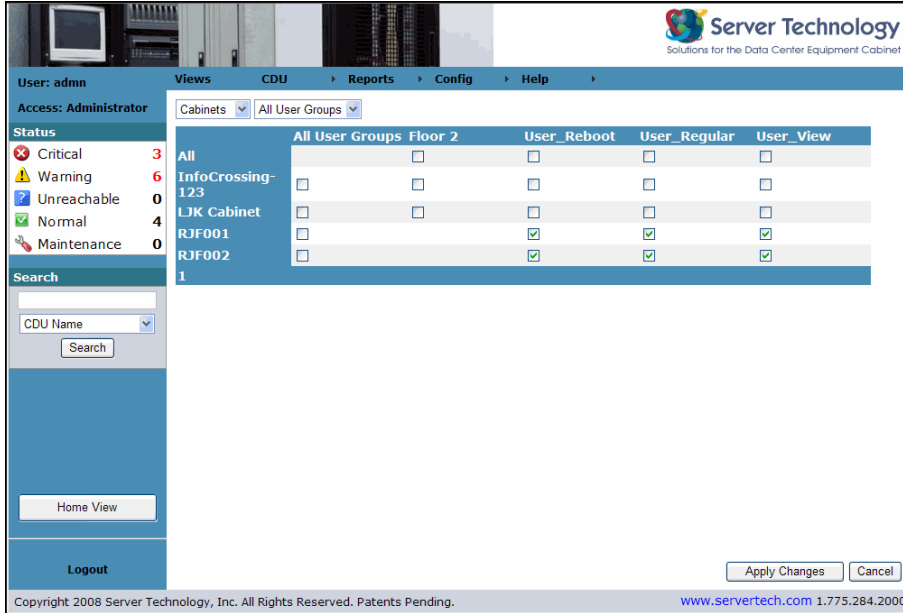
### Assigning user group permissions to locations:

1. Select the menu option **Config > Group Permissions > Locations**.
2. Select Locations from the drop-down list.
3. To grant permissions, check the corresponding checkboxes between individual location names (on the left) and individual user group names (at the top).
  - To deny permissions, clear the checkboxes as necessary.
  - To view and assign permissions for a specific user group, select the user group name from the pull-down list.
4. Click **Apply Changes**. User group permissions for locations are updated.

**NOTE:** To assign permissions to all user groups for a single location or multiple locations, check the All User Groups checkbox.

## Setting Permissions for Cabinets

The **Config > Group Permissions > Cabinets** page displays current cabinet names and user group names for viewing and assigning user group permission to cabinets.



Status	Cabinet Name	All User Groups	Floor 2	User_Reboot	User_Regular	User_View
Critical (3)	All	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Warning (6)	InfoCrossing-123	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Unreachable (0)	LJK Cabinet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Normal (4)	RJF001	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Maintenance (0)	RJF002	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

### Assigning user group permissions to cabinets:

1. Select the menu option **Config > Group Permissions > Cabinets**.
2. Select Cabinets from the drop-down list.
3. To grant permissions, check the corresponding checkboxes between individual cabinet names (on the left) and individual user group names (at the top).
  - To deny permissions, clear the checkboxes as necessary.
  - To view and assign permissions for a specific user group, select the user group name from the pull-down list.
4. Click **Apply Changes**. User group permissions for cabinets are updated.

---

**NOTE 1:** To assign permissions to all user groups for a single cabinet or multiple cabinets, check the All User Groups checkbox.

---

**NOTE 2:** The screen sample above shows the cabinets RJF001 and RJF002 are not available to user group “Floor 2”. To make cabinets available to user groups, first the **location** where the cabinet resides must be made available to the user group at **Config > Group Permissions > Locations**.

---

## Setting Permissions for CDUs

The **Config > Group Permissions > CDUs** page displays current CDU names and user group names for viewing and assigning user group permission to CDUs.

The screenshot shows the 'CDUs' configuration page in the Server Technology web interface. The page displays a table of CDUs with columns for 'All User Groups', 'Floor 2', 'User\_Reboot', 'User\_Regular', and 'User\_View'. The 'All User Groups' column is checked for all CDUs. The 'Floor 2' column is unchecked for all CDUs. The 'User\_Reboot', 'User\_Regular', and 'User\_View' columns are checked for the 'All' user group and the '10.1.2.130a' CDU. The '10.1.2.130a' CDU is highlighted in blue. The page also shows a search bar, a status summary, and navigation buttons.

Status	Count	CDU Name	All User Groups	Floor 2	User_Reboot	User_Regular	User_View
Critical	3	All	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Warning	6	10.1.2.130a	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Unreachable	0	10.1.2.131	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Normal	4	10.1.2.133	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Maintenance	0	10.1.2.137	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		10.1.2.138	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		10.1.6.3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		10.1.6.4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		66.214.208.132	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		66.214.208.90	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		66.214.208.91	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		66.214.208.92	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		66.214.208.93	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		66.214.208.94	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### Assigning user group permissions to CDUs:

1. Select the menu option **Config > Group Permissions > CDUs**.
2. Select CDUs from the drop-down list.
3. To grant permissions, check the corresponding checkboxes between individual CDU names (on the left) and individual user group names (at the top).
  - To deny permissions, clear the checkboxes as necessary.
  - To view and assign permissions for a specific user group, select the user group name from the pull-down list.
4. Click **Apply Changes**. User group permissions for CDUs are updated.

**NOTE 1:** To assign permissions to all user groups for a single CDU or multiple CDUs, check the All User Groups checkbox.

**NOTE 2:** The screen sample above shows five CDUs that are not available to user group "Floor 2". To make CDUs available to user groups, first the **cabinet** where the CDU resides must be made available to the user group at **Config > Group Permissions > Cabinets**.



## Setting Permissions for Outlets

The **Config > Group Permissions > Outlets** page displays current outlet names and user group names for viewing and assigning user group permission to outlets. The Outlets page refreshes automatically every 10 seconds.

Status	Count	All	All User Groups	Web Demo
Critical	0	All	<input type="checkbox"/>	<input type="checkbox"/>
Warning	3	66.214.208.90::Server1	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Unreachable	0	66.214.208.90::TowerA_Outlet2	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Normal	7	66.214.208.90::mainswitch	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Maintenance	0	66.214.208.90::TowerA_Outlet4a	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		66.214.208.90::TowerA_Outlet5a	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		66.214.208.90::TowerA_Outlet6	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		66.214.208.90::TowerA_Outlet7	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		66.214.208.90::Outlet123	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		66.214.208.90::TowerB_Outlet1a	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		66.214.208.90::TowerB_Outlet2	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		66.214.208.90::TowerB_Outlet3	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		66.214.208.90::TowerB_Outlet4a	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		66.214.208.90::TowerB_Outlet5a	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		66.214.208.90::TowerB_Outlet6	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		66.214.208.90::TowerB_Outlet7	<input type="checkbox"/>	<input checked="" type="checkbox"/>

### Assigning user group permissions to outlets:

1. Select the menu option **Config > Group Permissions > Outlets**.
2. Select Outlets from the drop-down list.
3. To grant permissions, check the corresponding checkboxes between individual outlet names (on the left) and individual user group names (at the top).
  - To deny permissions, clear the checkboxes as necessary.
  - To view and assign permissions for a specific outlet, select the user group name from the pull-down list.
4. Click **Apply Changes**. User group permissions for outlets are updated.

**NOTE 1:** To assign permissions to all user groups for a single outlet or multiple outlets, check the All User Groups checkbox.

**NOTE 2:** The screen sample above shows five outlets that are not available to user group "Floor 2". To make outlets available to user groups, first the CDU where the outlet resides must be made available to the user group at **Config > Group Permissions > CDUs**.

## Configuring Email Alerts

The **Config > Email** page configures the email delivery of requested SPM system activity logs to a primary and secondary email address.

The screenshot shows the 'CONFIGURE EMAIL DELIVERY OF SELECTED SPM LOGS' configuration page in the Server Technology web interface. The interface includes a sidebar with user information (User: admin, Access: Administrator), a status summary table, a search section, and a main configuration area. The status summary table is as follows:

Status	Count
Critical	1
Warning	3
Unreachable	0
Normal	6
Maintenance	0

The configuration area contains the following fields and options:

- SMTP Hostname/IP: [Text Input]
- SMTP Port: 25 [Text Input]
- Email From Address: [Text Input]
- Primary email send-to m\_Address: [Text Input]
- Secondary email send-to m\_Address: [Text Input]
- Select log categories to send via email:
  - Discovery Status
  - User Logons
  - User Actions
  - Alarm Status
- [Apply] button

As system activity occurs, requested logs can be emailed to configured email addresses. You can provide a primary recipient, a secondary recipient, or both primary and secondary. Primary and secondary addresses receive the same activity log alerts at the same time.

## User Groups

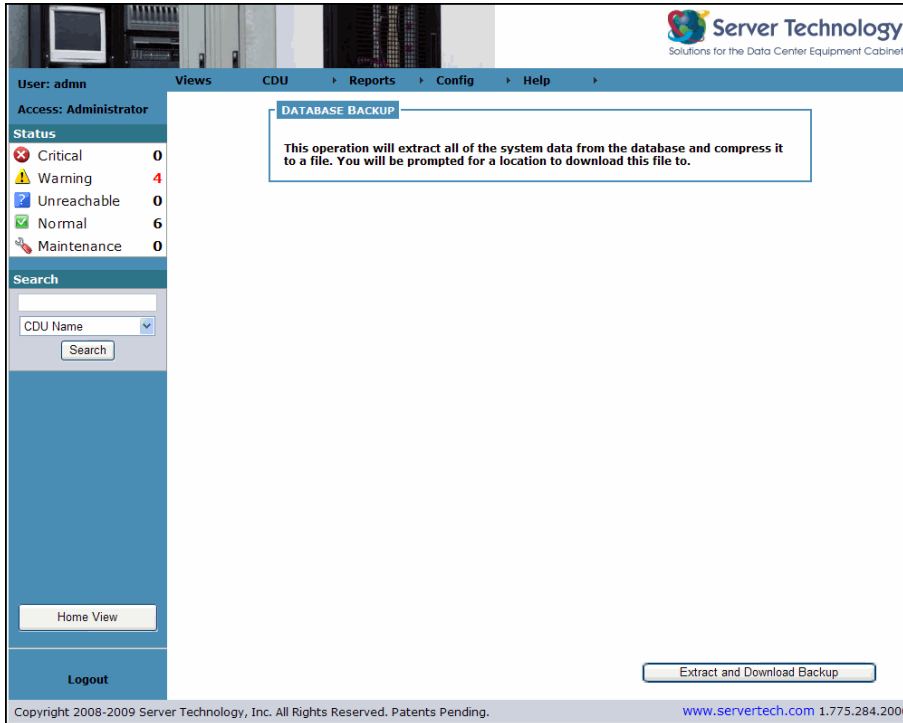
Depending on the format of the send-to email addresses, you may send logs to primary and/or secondary user groups. When the status of a CDU changes (for example, from Normal to Warning), all users in the group are notified.

### *To configure email delivery:*

1. Type the SMTP Hostname (or IP address) and SMTP port number in the boxes provided.
2. Type the From address, and the primary/secondary To addresses. Make sure the addresses are a valid email format.
3. Check the system logs to be delivered. Both primary and secondary email recipients receive the same selected logs.
4. Click **Apply**.

## Backing Up the SPM Database

The **Config > Backup** page gives the administrator a database backup function that extracts SPM system data from the database and compresses the data to a file.



To back up the SPM database, click **Extract and Download Backup**. The Backup feature creates the **SPMDBBackup.sti** file for storage on the SPM appliance. If needed, the **SPMDBBackup.sti** file can manually be used to restore the SPM database.

## Setting Up the SPM Appliance

The Config > Access page gives the administrator basic configuration options for setting up Sentry Power Manager as an appliance without the need to configure through the operating system.

The screenshot displays the configuration interface for the Sentry Power Manager (SPM) appliance. The interface is divided into several sections:

- Header:** Server Technology logo and navigation menu (Views, CDU, Reports, Config, Help).
- User Information:** User: admn, Access: Administrator.
- Status:** A table showing system health: Critical (1), Warning (5), Unreachable (4), Normal (4), Maintenance (1).
- Search:** A search bar with a dropdown menu for 'CDU Name' and a 'Search' button.
- Configuration Panels:**
  - SYSTEM:** Hostname: sti-spm.
  - NETWORK PORT 1:** Radio buttons for 'Obtain an IP Address Automatically' and 'Use the following IP Address'. Fields for IP Address (10.1.6.215), Subnet Mask (255.255.0.0), and Gateway (10.1.1.1).
  - NETWORK PORT 2:** Radio buttons for 'Disable this Adapter', 'Obtain an IP Address Automatically', and 'Use the following IP Address'. Fields for IP Address, Subnet Mask, and Gateway.
  - WEB:** Web Port: 80.
  - TELNET:** Checked box for 'Enable Telnet Access', Telnet Port: 23.
- Buttons:** 'Apply Changes' and 'Reset' at the bottom right.
- Footer:** Copyright 2008 Server Technology, Inc. All Rights Reserved. Patents Pending. www.servertech.com 1.775.284.2000.

The Access feature lets SPM connect to, and communicate with, your current established network. Typical configuration of SPM is one IP connection turned on, however, there are two network cards on the SPM appliance: Network Port 1 and Network Port 2. Each network card can be used to connect to different networks.

### Connectivity Options

The following connectivity options are available with the Access feature:

- Web Configuration: with a logged-in SPM user session (**adm**n login only).
- Serial Port Configuration: through the serial port located on the back of the SPM appliance.
- Telnet Configuration: by a Telnet application.

## Telnet and Serial Connections

- The Telnet and serial connections allow for a Reboot command and display the serial number of the machine.
- Modem cables are NULL (for serial connection) and standard (for Telnet connection).
- The serial connection network parameters are:
  - Standard NULL modem cable
  - 57600 bits per second
  - Data Bits = 8
  - Parity Bits = none
  - Stop Bit = 1
- The default login name and password for Telnet and serial access is the same as the Sentry Power Manager web default (username/password = **admn/admn**). Any administrative user created also has a working username and password.
- Changing the password of the admn login is strongly suggested and can only be done through the web interface.
- For Windows: the flow control value is the Windows default.
- All SPM administrative user accounts created can login through the serial and Telnet connections.

### Setting the System Hostname/IP Address:

In the Hostname field, type a Hostname (or IP Address) and click **Apply Changes**.

### Setting the Network Port 1 IP Address:

Select an option either to obtain the Network Port 1 IP address automatically through DHCP or to configure the IP address manually.

If you choose the DHCP address, the IP Address (as provided by your DHCP server), Subnet Mask, and Gateway fields for the Network Port 1 populate with the assigned names. If you choose the manual address, the IP Address, Subnet Mask, and Gateway fields allow you to enter the desired entries.

For both the automatic and manual options, save data by clicking **Apply Changes**.

### Setting the Network Port 2 IP Address:

By default Network Port 2 is disabled. To enable, select one of the following options:

- Obtain the Network Port 2 IP address automatically through DHCP
- Configure the IP address manually

If you choose the DHCP address, the IP Address (as provided by your DHCP server), Subnet Mask, and Gateway fields for the Network Port 1 populate with the assigned names. If you choose the manual address, the IP Address, Subnet Mask, and Gateway fields allow you to enter the desired entries.

For both the automatic and manual options, save data by clicking **Apply Changes**.

### Setting the Web Port Number:

Type the desired Web Port number and click **Apply Changes**.

### Enabling Telnet Access

To enable Telnet access, check the Enable Telnet Access checkbox. Accept the displayed number in the Telnet Port field or type over the number, and click **Apply Changes**.

### Enabling Serial Access:

To enable Serial port access, check the Enable Serial Access checkbox and click **Apply Changes**.

### Enabling Database ODBC Access (Optional):

To enable Database ODBC Access, check the Enable DB Access checkbox. Accept the displayed number in the DB Port field or type over the number, and click **Apply Changes**.

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**NOTE:** If ODBC has not been purchased separately and turned on by a SPM validation key, the Database "Enable DB Access" dialog box will not be available on the Access page.

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## Getting Help for SPM

The following options are available on the Help menu for technical information and product support:

### Help Menu Options

Option	Description
Support	Contact information for <b>SMARTER</b> Technical Support and links to this user operations manual at Server Technology's website..
Licenses	(Administrator only) Allows update for an additional SPM license key; also displays current SPM release number and the current number of supported CDUs, and other enabled features.

## Support

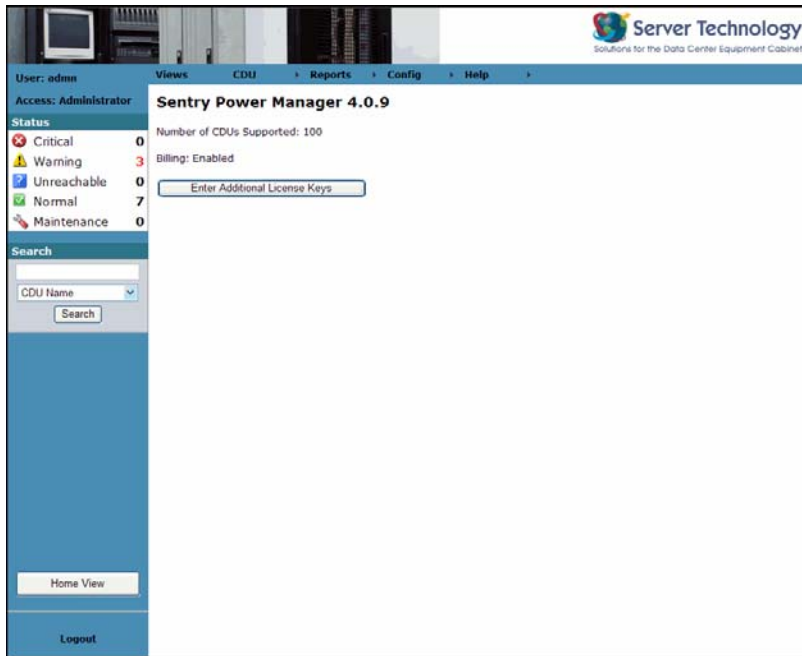
The **Help > Support** option shows contact information for Server Technology's **SMARTER** Technical Support. In addition, links are provided to the Server Technology website and to the *Sentry Power Manager – Operations Manual*.



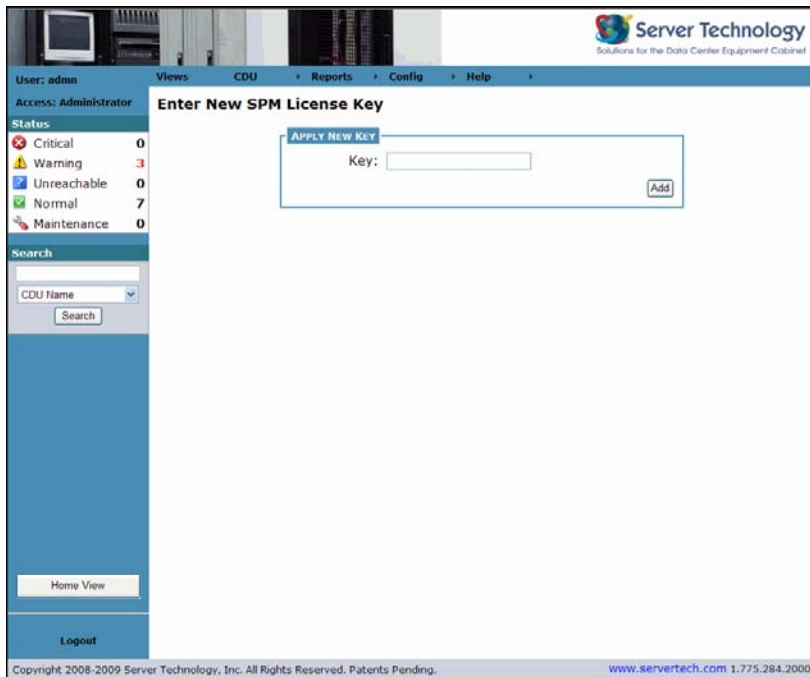
The screenshot shows the SMARTER Technical Support page within the Sentry Power Manager interface. The page features a navigation menu with options like Views, CDU, Reports, Config, and Help. A status section on the left lists Critical (0), Warning (3), Unreachable (0), Normal (7), and Maintenance (0). The main content area includes a search bar, contact information for Server Technology, Inc. (1040 Sandhill Drive, Reno, Nevada 89521 USA, Tel: 775.284.2000, Fax: 775.284.2065, Web: www.servertech.com, Email: support@servertech), and a 'Home View' button. The footer contains copyright information and the website URL.

## SPM License Page

For the administrator: The **Help > Licenses** option allows the administrator to update to an additional SPM license key that supports more CDUs in the network. The page also displays the current SPM release number and the number of CDUs supported under the current license key. The page also shows if the Billing reports feature is enabled.



Click the **Enter Additional License Keys** button to display the following page:



### To apply a new SPM license key:

1. Obtain the new license key from you Server Technology Account Representative at 800.835.1515 (domestic) or +00 (1) 775.284.2000 (international). An alpha-numeric key will be generated for you based on the serial number of the appliance that contains SPM.
2. Type the new key you receive in the Key field and click **Add**.

**NOTE:** To purchase additional Sentry Power Manager SPM Licenses, please contact your Server Technology representative at 1-800-835-1515 (domestic), +00 (1) 775.284.2000 (international), or [sales@servertech.com](mailto:sales@servertech.com).

## Chapter 4: Appendices

### Appendix A: Technical Specifications

#### 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:  
[www.servertech.com/support/recycling](http://www.servertech.com/support/recycling).

### Appendix B: Warranty, Product Registration, and Technical Support

#### Warranty

For [Server Technology Warranty](#) information, please see our website.

#### 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 products online today!](#)

#### Technical Support



Experience Server Technology's FREE **SMARTER** Technical Support - [Learn more...](#)

Server Technology understands that there are often questions when installing and/or using a new product. Free Technical Support is provided from 6:00 AM to 7:00 PM, Monday-Friday, Pacific Time.

Server Technology, Inc.

1040 Sandhill Drive

Reno, Nevada 89521 USA

Tel: 775.284.2000

Fax: 775.284.2065

Web: [www.servertech.com](http://www.servertech.com)

Email: [support@servertech.com](mailto: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:

Please review Server Technology's [Return Merchandise Authorization](#) process on our website.







## Server Technology

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