

## Server Technology's Energy Management Solution for Cabinet Distribution Units (CDUs) in the Cisco EnergyWise Network™

### Purpose

This technical note documents the connection instructions and command actions required for using the Cisco EnergyWise™ solution from Cisco Systems for the Server Technology CDUs in your IP network. This energy management method allows discovered CDUs to communicate as endpoints within the Cisco EnergyWise network. Device power requirements can then be accurately monitored, analyzed, and controlled to optimize energy usage that drives down energy costs at the rack level and across the data center enterprise.

### Overview

Any Server Technology intelligent rack mount Power Distribution Unit (PDU) – with or without POPS/PIPS technology – is certified and interoperable as an endpoint within the Cisco EnergyWise client technology to capture device power information within the existing EnergyWise infrastructure.

**Note:** The Server Technology solution with Cisco EnergyWise offers a unique advantage: you can simplify energy management for **both** the infeeds and outlets on your CDUs. Inlet information can be reported through PIPS, and outlet information can be reported through POPS.

### Before You Begin

The following quick reference shows what you need to connect CDUs to the EnergyWise network:

#### **Enabling EnergyWise**

Support for Cisco EnergyWise is automatically available in Server Technology Sentry firmware release 6.1.e and greater. The EnergyWise option is disabled by default; you have the choice of enabling EnergyWise support, or just leaving it disabled.

#### **Configure SNTP**

Before Server Technology CDUs can be connected to the EnergyWise network, SNTP must be configured.

#### **EnergyWise System Name**

The system name is **Sentry3\_XXXXXX** (X's = last 3 octets of the serial number), and the system name cannot be configured.

You can set all other names in the EnergyWise system, but the names are restricted by the normal Server Technology naming conventions for uniqueness, character restriction rules, and name lengths of 24 characters.

#### **Firmware Reporting Hierarchy**

The Sentry firmware in the EnergyWise network reports CDU power usage data using the following hierarchy:

1. Total power usage.
2. Tower power usage (total usage of all towers; for example, the total of TowerA + TowerB).
3. Infeed power usage.
4. Outlet power usage (only reported if the CDU is POPS device).

### How to Connect CDUs to EnergyWise

Command actions are supported through the Sentry firmware Command Line Interface (CLI), specifically for Cisco EnergyWise. Once you have enabled the EnergyWise option with a CLI command, Server Technology CDUs can then be connected to the Cisco Energywise network. To make the connection, you must also issue the required CLI commands to configure domain, port, and secret.

**Note:** Only commands through the CLI are supported for EnergyWise; there is no Sentry firmware web-based interface for EnergyWise.

### Issuing CLI Commands for EnergyWise

To implement the following **set energywise** and **show energywise** CLI commands, a restart of the CDU is required. You will be prompted for the restart.

The following examples show “Switched CDU:” as the CLI prompt, however, the prompt you see on the command line will vary depending on the type of CDU you have.

#### Step 1. Enable EnergyWise (Required)

To enable or disable EnergyWise support:

At the CDU prompt, type **set energywise**, followed by **enabled** or **disabled**, and press **Enter**.

*Example:*

```
Switched CDU: set energywise enabled

Command successful -- restart required
```

#### Step 2. Set Up CDUs in the EnergyWise Network (Required)

**Note:** To use EnergyWise, you must configure domain name, port, and secret.

To set the domain name (the EnergyWise domain the device belongs to):

At the CDU prompt, type **set energywise domain**, followed by the domain name, and press **Enter**.

(The limit of the Domain Name is 64 characters.)

*Example:*

```
Switched CDU: set energywise domain 10.1.2.120

Command successful
```

To set the port:

At the CDU prompt, type **set energywise port**, followed by the port number, and press **Enter**.

(Default Port number is 43440; valid range is 1-65535.)

*Example:*

```
Switched CDU: set energywise port
Port [666]: 700

Command successful
```

To set the EnergyWise secret:

At the CDU prompt, type **set energywise secret**, then verify the secret, and press **Enter**.

(The limit of the Secret field is 64 characters.)

*Example:*

```
Switched CDU: set energywise secret
  Secret: *****
  VerifySecret: *****

  Command successful
```

**Note:** A blank secret is also acceptable.

To set a blank EnergyWise secret:

At the CDU prompt, type **set energywise secret**, do not type in the Secret field, and press **Enter** twice (to bypass the Secret field and the VerifySecret field).

When viewed, the endpoint (CDU) will show "(Blank)" in the Secret field.

*Example of a blank secret:*

```
Switched CDU: show energywise

  EnergyWise Configuration

  Endpoint:          Enabled *
  Port:              666
  Domain:
  Refresh Rate:     60

  Secret:            (Blank)

  Command successful
```

### **Step 3. Configure the Refresh Rate (Optional)**

The Refresh Rate is the discovery interval for the CDU; the default is 180 seconds. If you prefer data to be reported more often, you can change the refresh rate. If you change the rate, a restart of the CDU is required, and you will be prompted for the restart.

To configure the refresh rate:

At the CDU prompt, type **set energywise refresh**, followed by refresh rate in seconds, and press **Enter**.

(Valid Refresh Rate range is 30-600 seconds; default is 180.)

*Example:*

```
Switched CDU: set energywise refresh 60

  Command successful
```

## Step 4. View Configured Items (Optional)

To view configured items:

At the CDU prompt, type **show energywise**, and press **Enter**.

*Example:*

```
Switched CDU: show energywise
```

```
EnergyWise Configuration
```

```
Endpoint:          Enabled*
```

```
Port:              666
```

```
Domain:            dominion
```

```
Refresh Rate:     88
```

```
Secret:            *****
```

```
*Value changed - restart required
```

```
Command successful
```

**Note:** A change in value (as shown in the example directly above), will require a restart of the system.

## Using an Energy Management Application

If you prefer using an energy manager to maximize control over networked CDUs, you can use any Cisco EnergyWise-compatible energy manager application of your choice.

JouleX Energy Manager is a unique network-based solution that leverages Cisco EnergyWise to monitor, analyze, and control energy consumption and usage for devices across your enterprise.

JouleX Energy Manager was designed to map to power distribution units like CDUs; therefore, a brief overview of the application is presented in this Technical Note as sample of an effective energy manager for the Server Technology CDUs in the Cisco EnergyWise network.

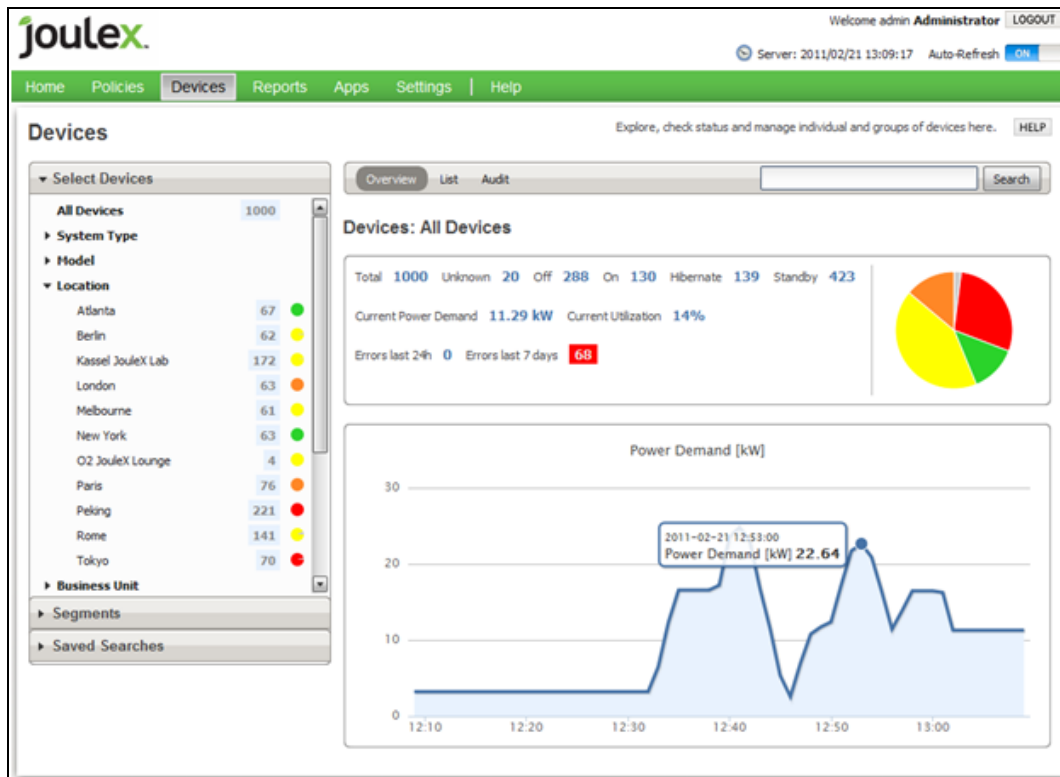


Figure 1. Joulex Energy Manager Dashboard

### Why Use an Energy Manager Application?

An energy manager uses a complex system of analysis and planning to optimize energy usage across the enterprise. The benefit of using an energy manager like the JouleX application is that you have a simple way for controlling energy consumption and managing energy-saving efforts in one sophisticated and interactive GUI, like the dashboard example shown in Figure 1.

The JouleX Energy Manager in particular eliminates the need to install software agents, smart devices, wireless sensors, or any additional software on individual networked devices. Overall you have wider and faster control over energy consumption throughout the network.

### What Can an Energy Manager Do?

After collecting data on discovered network devices, the JouleX application periodically monitors and analyzes device data for current power usage and then determines how energy usage can be reduced. You can capture device energy measurements in a central location and drill down graphically to individual devices to monitor detailed power data and get visibility into power usage across the enterprise.

## **Quick Overview of Features**

The JouleX application offers many user-configurable energy management features for integration in the Cisco EnergyWise domain. A few key features are noted:

### *Policies and Rules*

You can actively control your network to save energy by creating policies to automatically and remotely control device power states, depending on various conditions and actions which you determine; for example, date and time (a condition) and changing the power state (an action).

The JouleX application collects and distributes centrally-managed policies to each CDU, requesting on demand power reduction, and reporting power usage statistics on the dashboard.

### *Advanced Query Filters*

Keyword: Allows you to assign unique descriptions to devices in the domain using arbitrary keywords; you can then act on the device using the keyword. For example, a keyword query can be issued that will turn off unnecessary devices while making sure critical devices remain on.

Importance: This parameter is the Cisco EnergyWise importance of the device. Importance levels rate your devices based on the assigned values. The range is 1 (least important) to 100 (most important). Only CDUs with importance values less than or equal to the specified value respond to the Importance query.

Role: A query filter can be established for the function, or role, of the device within the Energywise domain.

Power Level: This parameter is the Cisco EnergyWise value that allows outlet devices from different manufacturers to work together and consistently manage power in the EnergyWise network. EnergyWise uses levels 0 (Off) to 10 (On). Each power level indicates the state of an endpoint in the network, for example a CDU. The JouleX application allows you to map from the EnergyWise power levels to the JouleX application, and then set different energy levels for Cisco EnergyWise supported devices to control their power consumption.

### *Reporting*

The JouleX reporting system allows viewing of system statistics in quick overviews or detailed reports. Collected device data can be used for extensive reporting and analysis. From dozens of available and expanded reports you can investigate detailed energy data for costs, consumption, savings, carbon emissions, and even identify “power hogs” among networked devices and systems.

## Reference Links

For more information about using the JouleX Energy Manager, see the Joulex website at: <http://www.joulex.net>

For more information about Cisco EnergyWise, see the Cisco Systems website at: [www.cisco.com/go/energywise](http://www.cisco.com/go/energywise)

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