CHAPTER 3

Managing Cisco EnergyWise Using LMS

Cisco EnergyWise is a comprehensive program for power management in your network. Cisco EnergyWise enables companies to save costs by measuring, managing, and reducing the power consumption of network infrastructure, and of devices attached to the network. EnergyWise reduces the time and effort required to transform business energy policy to real energy savings.

Cisco Prime LMS provides a set of management functionalities to simplify and automate the energy management lifecycle.

Power management for EnergyWise in LMS consists of the following:

- Assessing EnergyWise readiness of the network
- Upgrading IOS, wherever required, to make the device EnergyWise capable
- Defining EnergyWise Domains
- Associating devices to the EnergyWise domain
- Defining Endpoint group and configuring EnergyWise policies
- Monitoring and reporting on energy consumption
- Troubleshooting power-related issues

Note EnergyWise in LMS does not support IPv6 address.

This section contains:

- Managing EnergyWise Endpoint Groups

- Managing EnergyWise Policies

- Managing EnergyWise Jobs

- Configuring EnergyWise Settings

- Viewing EnergyWise Collection Summary

What is EnergyWise?

Cisco® EnergyWise lets your Cisco network act as a platform that can measure, monitor, and manage the way your devices consume energy. In a Cisco EnergyWise network, EnergyWise monitors and manages the power usage of powered devices, Cisco devices in a domain, and the endpoints connected to them.

From the Cisco EnergyWise perspective, your network has three kinds of devices:

- **Endpoints**: Devices that use power. They are Power over Ethernet (PoE) and non-PoE devices that connect to the network.They can receive power from an AC power source, a DC power source, or a power supply.They only respond to queries. For example, IP phone, access point, or PC.

- **Domain members**: Cisco switches, and network devices that use power. They forward messages across the network to form an EnergyWise domain with other Cisco devices and end points connected to them. They also forward and reply to queries from the management station and aggregate power-usage information from the end points.
  A domain is treated as one unit of power management and is similar to a network-management community.

- **Management stations**: These are the control applications and devices that use Cisco EnergyWise features to measure, monitor, and manage power consumption. Management solutions can use Cisco EnergyWise queries to act as the point of control for one or more Cisco EnergyWise domains.
  For example, a server with LMS is a management solution.

Features and Benefits of EnergyWise in LMS

EnergyWise in LMS provides comprehensive support for automating and monitoring power for networking devices in the enterprise. Table 3-1 lists the features and benefits of EnergyWise in LMS.

Table 3-1   Features and Benefits of EnergyWise in LMS

Feature	Benefits
Assess EnergyWise readiness of the network	• You can quickly identify EnergyWise-enabled and EnergyWise-capable devices. • Easily upgrade images on EnergyWise-software-incapable devices to support EnergyWise. See, Getting Started with EnergyWise for more details.
Enable EnergyWise on devices	• You can select EnergyWise Capable devices and assign them to EnergyWise domains. • You can configure EnergyWise attributes like role, keyword, and importance on the devices. See, Enabling EnergyWise on Devices for more details.
Configure EnergyWise endpoints	• Supports both PoE and non-PoE endpoints. Note You must install an EnergyWise client, like Verdiem, Orchestrator, on non-PoE endpoints for them to become EnergyWise endpoints. • You can configure EnergyWise attributes like role, keyword, and importance on the endpoints. • You can export or import the list of EnergyWise endpoints to or from a client. See, Configuring EnergyWise Attributes on Endpoints for more details.
Configure and implement energy management policies	• You can deploy energy policy through easy workflows; configure power policy, using events, for devices based on time of day for groups and classes of devices Using events you can set the power level of endpoints for a specific time period. • You can configure multiple endpoints in a single workflow: reduces the error-prone setup associated with manual configuration; improves overall network availability and accuracy of policy • You can update and provision EnergyWise policies automatically on all endpoints in a domain. See, Applying EnergyWise Policies to Endpoints for more details.
Monitor and report on power consumption	• You can identify power usage of EnergyWise domains quickly through charts and graphs; with real-time status for quickly isolating potential power issues • You can understand pattern of power consumption; identify peak usage and trends to plan for power and utility savings See, Understanding the EnergyWise Dashboard for more details.

Table 3-1 **Features and Benefits of EnergyWise in LMS**

Feature	Benefits
Generates syslogs and traps on energy violations	• You can configure the power consumption threshold, which when violated, generates a trap, generates a syslog of a specified severity, sends notifications to the specified mail IDs, and executes the specified commands. • Notifies when there is a threshold violation See, Configuring Threshold Settings for more details.
EnergyWise dashboard	• Organizes all EnergyWise functions into a single portal for quick navigation and real-time energy updates • Provides a snapshot of the effect of EnergyWise in the network; you can monitor power consumption of your network. See, Understanding the EnergyWise Dashboard for more details.

Understanding the EnergyWise Dashboard

You can access the EnergyWise dashboard using:

- **Work Centers > EnergyWise > Dashboard**
- **My Menu > Default Dashboards > EnergyWise Dashboard**
- **Monitor > Dashboards > EnergyWise**

The EnergyWise Dashboard displays all the EnergyWise portlets. The various EnergyWise portlets are:

- EnergyWise - Power Consumption Graph
- EnergyWise - Total Savings Graph
- EnergyWise - Savings Trend Graph
- EnergyWise - Current Power Consumption
- EnergyWise - Policy Override
- EnergyWise - Endpoint Group
- EnergyWise - Capability Summary

EnergyWise - Power Consumption Graph

You can view this portlet in the EnergyWise dashboard using:

- **Work Centers > EnergyWise > Dashboard**
- **My Menu > Default Dashboards > EnergyWise**
- **Monitor > Dashboards > EnergyWise**

EnergyWise Power Consumption portlet provides information about the power consumed by an endpoint group in kwh. You can regenerate the graph by specifying a duration in the time slider. You can click the View as Chart and View as Grid to view the portlet information in the required format.

To configure the portlet:

Step 1   Move the mouse over the title bar of the EnergyWise Power Consumption portlet to view the icons.

Step 2   Click the Configuration icon.

Step 3   Select the Auto Refresh check box to set the refresh time.

Step 4   Select the minute or hour from the Refresh Every drop-down list to change the Refresh time. The items in the portlet get refreshed according to the specified refresh time.

Step 5   Select an EnergyWise endpoint group from the Groups drop-down list. You can select a maximum of five groups.

Step 6   Click **Save** to save your settings for this portlet.

EnergyWise - Total Savings Graph

You can view this portlet in the EnergyWise dashboard using:

- **Work Centers > EnergyWise > Dashboard**
- **My Menu > Default Dashboards > EnergyWise**
- **Monitor > Dashboards > EnergyWise**

EnergyWise Total Savings Graph Portlet provides information about the energy savings, tree savings and carbon emissions, of the selected groups. The EnergyWise Total Savings table displays the following information:

Field	Description
Endpoint Groups	Displays the name of the endpoint group.
Entity Count	Displays the number of endpoints in the endpoint group.
Actual Usage	Displays the average amount of energy used.
Savings (kwh)	Displays the savings in kwh according to: Energy Saving (kwh) = Maximum Energy Usage (kwh) – Actual Energy Usage (kwh)
Savings (%)	Displays the above savings in %.
Money Savings	Displays the savings according to the cost per kwh in US dollars.
Tree Savings	Displays the number of trees you do not have to plant, because of the energy you have saved using EnergyWise in your network. This value is according to the formula: 1 Urban Tree planted = 39 Kg CO_2 The number of trees planted is directly proportional to the amount of carbon emitted.
Carbon Emissions	Displays the carbon emissions savings in kilograms according to: 1 kwh = 0.718 Kg CO_2 (Carbon Emission)

It also displays a bar chart that shows the actual and maximum power usage based on the selected groups. during a specific time period.

Note The cost savings for the specified period is calculated as: the average daily savings (calculated using the available data) x number of days in specified period. For example, if you selected the periodicity of the report as weekly, the weekly cost savings would be the average cost savings per day multiplied by 7.

To configure the portlet:

Step 1   Move the mouse over the title bar of the EnergyWise Total Savings Graph portlet to view the icons.

Step 2   Click the Configuration icon.

Step 3   Select the Auto refresh check box to set the refresh time.

Step 4   Select the minute or hour from the Refresh Every drop-down list to change the Refresh time. The items in the portlet get refreshed according to the specified refresh time.

Step 5   Select an EnergyWise endpoint group from the Groups drop-down list. You can select a maximum of five groups.

Step 6   Enter the Cost per kwh in the text box. The currency is US dollar.

Step 7   You can select the following check boxes if you want them to appear in the chart or the grid:

- Money Savings
- Tree Savings
- Carbon Emissions

Step 8   Click **Save** to save your settings for this portlet.

EnergyWise - Savings Trend Graph

You can view this portlet in the EnergyWise dashboard using:

- **Work Centers > EnergyWise > Dashboard**
- **My Menu > Default Dashboards > EnergyWise**
- **Monitor > Dashboards > EnergyWise**

The EnergyWise Savings Trend Graph provides information about the average and actual power usage of a selected group over a specific time period. You can select the time using the time slider. You can click the View as Chart and View as Grid to view the portlet information in the required format.

To configure the portlet:

Step 1   Move the mouse over the title bar of the EnergyWise Power Consumption portlet to view the icons.

Step 2   Click the Configuration icon.

Step 3   Select the Auto refresh check box to set the refresh time.

Step 4   Select the minute or hour from the Refresh Every drop-down list to change the Refresh time. The items in the portlet get refreshed according to the specified refresh time.

Step 5   Select an EnergyWise endpoint group from the Groups drop-down list.

Step 6   Click **Save** to save your settings for this portlet.

EnergyWise - Current Power Consumption

You can view this portlet in the EnergyWise dashboard using:

- **Work Centers > EnergyWise > Dashboard**
- **My Menu > Default Dashboards > EnergyWise**
- **Monitor > Dashboards > EnergyWise**

The EnergyWise Current Power Consumption portlet displays the total current power consumption of an endpoint, domain or a subset of a domain depending on the keyword.

The fields that appear in this portlet are:

Field	Description
Select Domain	Select an EnergyWise domain from the drop-down list.
	The name will be the name of the end point.
Select Attribute	Select Keyword or Name as the attribute for listing the keywords or endpoints.
Select Importance	Enter the value of EnergyWise Importance.
	This value differentiates the devices in a domain based on their power usage. For example, a desk phone has a lower importance than a business-critical emergency phone.
Select Keyword	Select a keyword for the domain, based on which you will get to know current power consumption. These keywords are defined when you create domains.
	This field appears when you select Keyword as an attribute.
Select Name	Select the endpoint whose power consumption you want to measure.
	This field appears when you select Name as an attribute.

Click **Current Power Consumption** to view the current power consumption of the endpoint.

EnergyWise - Policy Override

You can view this portlet in the EnergyWise dashboard using:

- **Work Centers > EnergyWise > Dashboard**
- **My Menu > Default Dashboards > EnergyWise**
- **Monitor > Dashboards > EnergyWise**

The EnergyWise Policy Override portlet allows you to change the power level of an EnergyWise endpoint.

To override an EnergyWise event for an endpoint:

Step 1   Enter one of the following parameters of the endpoint:

- User Name—User name of the endpoint.
- IP Address—IP Address of the endpoint.
- MAC Address —MAC Address of the endpoint.

Note   Ensure that the endpoint is discovered through User Tracking in LMS.

Step 2   Click **Get End Host Details** to get the details of the endpoint. The following endpoint details appear in the End host Details grid:

- User Name—User name of the endpoint.
- IP Address—IP Address of the endpoint.
- Host Name—Name of the host.
- Device Name—Name of the endpoint.
- MAC Address —MAC Address of the endpoint.
- Port Name—Port number to which the host is connected.
- ifindex— Interface index of the port. For example, 10
- Port Description—Description of the port number to which the endpoint is connected.
- Power Level—This level indicates the current power state of the endpoint.

Step 3   Select the power level that you want to change to. The range is from 0 to 10.

Select one of the following:

- 0 - Shut Down
- 1 - Hibernate
- 2 - Sleep
- 3 - Standby
- 4 - Ready
- 5 - Low
- 6 - Frugal
- 7 - Medium

- 8 - Reduced
- 9 - High
- 10 - Full

Step 4   Select one of the following Scheduler options:

- Override immediately—Select this option to apply the event immediately on the endpoint.

- Override at—Select this option and select a start date, and the start time in the HH:MM format to apply the event at the specified time and day.

Step 5   Click **Override** to apply the event on the specified endpoint.

EnergyWise - Endpoint Group

You can view this portlet in the EnergyWise dashboard using:

- **Work Centers > EnergyWise > Dashboard**
- **My Menu > Default Dashboards > EnergyWise**
- **Monitor > Dashboards > EnergyWise**

You can apply EnergyWise policies to the endpoints only if they are part of endpoint groups. The EnergyWise Policy Groups portlet provides information about the number of compliant and non-complaint endpoints, and power consumption of the endpoint groups.

The following are the details of the portlet:

Field	Description
Endpoint Group Name	Displays the name of the endpoint group.
Entity Count	Displays the number of endpoints in the domain.
Non-compliant Entities	Displays the number of non-compliant endpoints. If the power level of an interface is different from that specified in the policy, then the interface is shown as a non-compliant entity.
Power Consumption (Last Cycle)	Displays the power consumption of the endpoint group in the last cycle, that is, the period after the last collection.

Move the mouse over the title bar of the EnergyWise Policy Groups portlet.

Click the configuration icon. You can specify the refresh interval and number of rows to appear in the portlet. Select the Auto Refresh interval to refresh the portlet automatically at the specified interval.

The Endpoint Group portlet shows the number of endpoints in the endpoint groups as entity count, and the number of non-compliant endpoints in the endpoint groups. The Total savings Graph portlet shows the number of endpoints responded to the query as entity count. The discrepancy in the entity count generated by endpoint group collection and power consumption collection may arise when the policies applied between endpoint group collection is changed.

EnergyWise - Capability Summary

The EnergyWise - Capability Summary displays the EnergyWise readiness of your network. You can click the View as Grid icon to view the number of devices of each category.

This portlet is not part of the EnergyWise dashboard, you can add this portlet to any dashboard.

To view this portlet in the EnergyWise dashboard:

Step 1   Go to EnergyWise dashboard and click on the Add portlet icon. The Add portlets pop-up appears with a list of all the portlets in LMS.

Step 2   Select EnergyWise - Capability Summary and click **Add**. The portlet appears in your dashboard.

A pie chart appears with the following types of devices.

- EnergyWise Enabled Devices
- EnergyWise Capable Devices
- EnergyWise Software Incapable Devices
- EnergyWise Hardware Incapable Devices

Click on any of the pie chart slices to view the EnergyWise Readiness Assessment page.

EnergyWise Enabled Devices

These devices have the supported IOS image for EnergyWise, and have EnergyWise enabled.

EnergyWise Capable Devices

These devices have the supported IOS image for EnergyWise, however, EnergyWise is not enabled on them. See, Enabling EnergyWise on Devices for more details.

EnergyWise Software Incapable Devices

These devices do not have the supported IOS image for EnergyWise. See EnergyWise Supported Devices and Images for more information.

EnergyWise Hardware Incapable Devices

These devices do not support the EnergyWise technology. You can get the latest EnergyWise supported hardware from Cisco.com. See Known List of Hardware-incapable Devices for more information.

EnergyWise Supported Devices and Images

Table 3-2 lists the devices and images, that support EnergyWise.

Table 3-2   *Supported Devices and Images for EnergyWise*

Device Type	Minimum Software
Cisco 3750 Stack	12.2(58)SE
Cisco Catalyst 3750G-12S Switch	12.2(58)SE
Cisco Catalyst 3750-24PS Switch	12.2(58)SE
Cisco 2600,2800,3700,3800 Series 16-Port Ether Switch Service Module	12.2(58)SE
Cisco 2800,3800 Series 23-Port Ether Switch Service Module	12.2(58)SE
Cisco 2851,3800 Series 48-Port Ether Switch Service Module	12.2(58)SE
Cisco 2851,3800 Series 24-Port Ether Switch (with Stackwise Connectors) Service Module	12.2(58)SE
Cisco Catalyst 3560G-24PS Switch	12.2(58)SE
Cisco Catalyst 3560G-24TS Switch	12.2(58)SE
Cisco Catalyst 3560G-48PS Switch	12.2(58)SE
Cisco Catalyst 3560G-48TS Switch	12.2(58)SE
Cisco Catalyst 3560-24PS Switch	12.2(58)SE
Cisco Catalyst 3560-48PS Switch	12.2(58)SE
Cisco Catalyst 3560-24TS Switch	12.2(58)SE
Cisco Catalyst 3560-48TS Switch	12.2(58)SE
Cisco Catalyst 3560E-24TD-E,S Switch	12.2(58)SE
Cisco Catalyst 3560E-48TD-E,S Switch	12.2(58)SE
Cisco Catalyst 3560E-24PD-E,S Switch	12.2(58)SE
Cisco Catalyst 3560E-48PD-E,S Switch	12.2(58)SE
Cisco Catalyst 3560-8PC Compact Switch	12.2(58)SE
Cisco Catalyst 3560E-12D-S,E Switch	12.2(58)SE
Cisco Catalyst 3560E-12SD-E,S Switch	12.2(58)SE
Cisco Catalyst 3560-12PC-S Compact Switch	12.2(58)SE
Cisco Catalyst 2960-24TC Switch	12.2(58)SE
Cisco Catalyst 2960-48TC Switch	12.2(58)SE
Cisco Catalyst 2960G-24TC Switch	12.2(58)SE
Cisco Catalyst 2960G-48TC Switch	12.2(58)SE
Cisco Catalyst 2960-24TT Switch	12.2(58)SE
Cisco Catalyst 2960-48TT Switch	12.2(58)SE
Cisco Catalyst 2960-8TC Compact Switch	12.2(58)SE

Table 3-2   Supported Devices and Images for EnergyWise (continued)

Device Type	Minimum Software
Cisco Catalyst 2960G-8TC Compact Switch	12.2(58)SE
Cisco Catalyst 2960-24-S Switch	12.2(58)SE
Cisco Catalyst 2960-24TC-S Switch	12.2(58)SE
Cisco Catalyst 2960-48TC-S Switch	12.2(58)SE
Cisco Catalyst 2960-24PC-L Switch	12.2(58)SE
Cisco Catalyst 2960-24LT-L Switch	12.2(58)SE
Cisco Catalyst 2960PD-8TT-L Compact Switch	12.2(58)SE
Cisco Catalyst 2960-8TC-S Compact Switch	12.2(58)SE
Cisco Catalyst 2960-48TT-S Switch	12.2(58)SE
Cisco Catalyst 3750G-12S-SD Switch	12.2(58)SE
Cisco Catalyst 3750E-24TD-E,S Switch	12.2(58)SE
Cisco Catalyst 3750E-48TD-E,S Switch	12.2(58)SE
Cisco Catalyst 3750E-48PD-E,S Switch	12.2(58)SE
Cisco Catalyst 3750E-24PD-E,S Switch	12.2(58)SE
Cisco Catalyst 3750G-24 Switch	12.2(58)SE
Cisco Catalyst 3750G-48 Switch	12.2(58)SE
Cisco Catalyst 3750-24TS Switch	12.2(58)SE
Cisco Catalyst 3750G-24T Switch	12.2(58)SE
Cisco Catalyst 3750-48PS Switch	12.2(58)SE
Cisco Catalyst 3750G-24PS Switch	12.2(58)SE
Cisco Catalyst 3750G-48PS Switch	12.2(58)SE
Cisco Catalyst 3750G-48TS Switch	12.2(58)SE
Cisco Catalyst 3750G-24TS-1U Switch	12.2(58)SE
Cisco Catalyst 3750-24FS Switch	12.2(58)SE
Cisco Catalyst 2960-48PST-L Switch	12.2(58)SE
Cisco Catalyst 2960-24LC-S Switch	12.2(58)SE
Cisco Catalyst 2960-24PC-S Switch	12.2(58)SE
Cisco Catalyst 2960-48PST-S Switch	12.2(58)SE
Cisco Enhanced Layer 2 Ether Switch Service Module	12.2(58)SE
Cisco Catalyst 3560V2-24DC Switch	12.2(58)SE
Cisco Catalyst 3560V2-24TS Switch	12.2(58)SE
Cisco Catalyst 3560V2-24PS Switch	12.2(58)SE
Cisco Catalyst 3560V2-48TS Switch	12.2(58)SE
Cisco Catalyst 3750V2-48PS Switch	12.2(58)SE
Cisco Catalyst 3750V2-24PS Switch	12.2(58)SE
Cisco Catalyst 3750V2-24TS Switch	12.2(58)SE

Table 3-2   Supported Devices and Images for EnergyWise (continued)

Device Type	Minimum Software
Cisco Catalyst 3750V2-48TS Switch	12.2(58)SE
Cisco Catalyst 2960x 48tsS	12.2(58)SE
Cisco Catalyst 2960 stack	12.2(58)SE
Cisco Catalyst 4507R Switch	12.2(52)SG
Cisco Catalyst 4506 Switch	15.0(2)SG
Cisco Catalyst 4503 Switch	12.2(52)SG
Cisco Catalyst 4510R Switch	12.2(52)SG
Cisco Catalyst 4948 Switch	12.2(52)SG
Cisco Catalyst 4948 10 Gigabit Ethernet Switch	12.2(52)SG
Cisco ME 4924-10GE Switch	12.2(52)SG
Cisco Catalyst 4006 Switch	12.2(52)SG
Cisco Catalyst 4506-E Switch	12.2(52)SG
Cisco Catalyst 4510R-E Switch	12.2(52)SG
Cisco Catalyst 4503-E Switch	12.2(52)SG
Cisco Catalyst 4507R-E Switch	12.2(52)SG
Cisco Catalyst 4928 10 Gigabit Ethernet Switch	12.2(52)SG
Cisco Catalyst 4948E Ethernet Switch	12.2(54)XO
Cisco 2951 Integrated Services Router	15.0(1)M2
Cisco 2901 Integrated Services Router	15.0(1)M2
Cisco 1941 Integrated Services Router	15.0(1)M2
Cisco 1941W Integrated Services Router	15.0(1)M2
Cisco 1921 Integrated Services Router	15.0(1)M2
Cisco 1905 Serial Integrated Services Router	15.0(1)M2
Cisco CGS-2520-24TC Connected Grid Switch	12.2(53)EX
Cisco CGS-2520-16S-8PC Connected Grid Switch	12.2(53)EX
Cisco 2010 Connected Grid Router	15.1(1)T
Cisco IE 3000-4TC Industrial Ethernet Switch	12.2(53)SE
Cisco IE 3000-8TC Industrial Ethernet Switch	12.2(53)SE
Rockwell Stratix MS06T	12.2(53)SE
Rockwell Stratix MS10T	12.2(53)SE
Cisco ME 3400G-12CS-A Switch	12.2(53)SE
Cisco ME 3400G-12CS-D Switch	12.2(53)SE
Cisco ME 3400G-2CS-A Switch	12.2(53)SE
Cisco ME 3400-24FS-A Switch	12.2(53)SE
Cisco ME 3400EG-2CS-A Switch	12.2(53)SE
Cisco ME 3400EG-12CS-M Switch	12.2(53)SE

Table 3-2   Supported Devices and Images for EnergyWise (continued)

Device Type	Minimum Software
Cisco ME 3400E-24TS-M Switch	12.2(53)SE
Cisco ME 3400-24TS-A Switch	12.2(53)SE
Cisco ME 3400-24TS-D Switch	12.2(53)SE
Cisco 3925E Integrated Services Router	15.1(1)T
Cisco 3945E Integrated Services Router	15.1(1)T
Cisco 861,861W Integrated Services Router	15.0(1)M2
Cisco 866 Integrated Services Router	15.0(1)M2
Cisco 867 Integrated Services Router	15.0(1)M2
Cisco 881,881W Integrated Services Router	15.0(1)M2
Cisco IAD881,IAD881W Integrated Access Device	15.0(1)M2
Cisco 881SRST,881SRSTW Integrated Services Router	15.0(1)M2
Cisco IAD881,IAD881W Integrated Access Device	15.0(1)M2
Cisco 886,886W Integrated Services Router	15.0(1)M2
Cisco IAD886,IAD886W Integrated Access Device	15.0(1)M2
Cisco 886SRST,886SRSTW Integrated Services Router	15.0(1)M2
Cisco 887,887W Integrated Services Routers	15.0(1)M2
Cisco IAD887,IAD887W Integrated Access Device	15.0(1)M2
Cisco 887SRST,887SRSTW Integrated Services Router	15.0(1)M2
Cisco 888,888W Integrated Services Router	15.0(1)M2
Cisco IAD888,IAD888W Integrated Access Device	15.0(1)M2
Cisco 888SRST,888SRSTW Integrated Services Router	15.0(1)M2
Cisco 891 Integrated Services Router	15.0(1)M2
Cisco 892 Integrated Services Router	15.0(1)M2
Cisco 885 Integrated Services Router	15.0(1)M2
Cisco IAD885F-D-3	15.0(1)M2
Cisco IAD888E,IAD888EW Integrated Access Device	15.0(1)M2
Cisco 887,887W Integrated Services Routers	15.0(1)M2
Cisco 861 Npe	15.0(1)M2
Cisco 881npe	15.0(1)M2

Table 3-2   Supported Devices and Images for EnergyWise (continued)

Device Type	Minimum Software
Cisco 881gnpe	15.0(1)M2
Cisco 887npe	15.0(1)M2
Cisco 888gnpe	15.0(1)M2
Cisco 891npe	15.0(1)M2
Cisco 887V Integrated Services Router	15.0(1)M2
Cisco 871 Integrated Services Router	15.0(1)M2
Cisco 876 Integrated Services Router	15.0(1)M2
Cisco 878 Integrated Services Router	15.0(1)M2
Cisco 877 Integrated Services Router	15.0(1)M2
Cisco 888E,888EW Integrated Services Router	15.0(1)M2
Cisco 888ESRST,888ESRSTW Integrated Services Router	15.0(1)M2
Cisco Catalyst 2960S-48TS-S Switch	12.2(53)SE2
Cisco Catalyst 2960S-24TS-S Switch	12.2(53)SE2
Cisco Catalyst 2960S-48FPD-L Switch	12.2(53)SE2
Cisco Catalyst 2960S-48LPD-L Switch	12.2(53)SE2
Cisco Catalyst 2960S-48TD-L Switch	12.2(53)SE2
Cisco Catalyst 2960S-24PD-L Switch	12.2(53)SE2
Cisco Catalyst 2960S-24TD-L Switch	12.2(53)SE2
Cisco Catalyst 2960S-48FPS-L Switch	12.2(53)SE2
Cisco Catalyst 2960S-48LPS-L Switch	12.2(53)SE2
Cisco Catalyst 2960S-24PS-L Switch	12.2(53)SE2
Cisco Catalyst 2960S-48TS-L Switch	12.2(53)SE2
Cisco Catalyst 2960S-24TS-L Switch	12.2(53)SE2
Cisco Catalyst 3750X-24T-L,S Switch	12.2(58)
Cisco Catalyst 3750X-48T-L,S Switch	12.2(58)
Cisco Catalyst 3750X-24P-L,S Switch	12.2(58)
Cisco Catalyst 3750X-48PF-L,S Switch	12.2(58)
Cisco Catalyst 3560X-24T-L,S Switch	12.2(58)
Cisco Catalyst 3560X-48T-L,S Switch	12.2(58)
Cisco Catalyst 3560X-24P-L,S Switch	12.2(58)
Cisco Catalyst 3560X-48PF-L,S Switch	12.2(58)
Cisco Catalyst 2975 Switch	12.2(50)SE
Cisco Catalyst 2350-48TD-S Switch	12.2(52)SE
Cisco Catalyst 2360-48TD-S	12.2(53)EY
Cisco Catalyst 4507R plus E Switch	03.01.00.SG
Cisco Catalyst 4510R plus E Switch	03.01.00.SG

Table 3-2   Supported Devices and Images for EnergyWise (continued)

Device Type	Minimum Software
Cisco ME 3600X-24FS-M Switch	12.2(52)EY
Cisco ME 3600X-24TS-M Switch	12.2(52)EY
Cisco ME 3800X-24FS-M Switch Router	12.2(52)EY
Cisco 887VA M Integrated Services Router	15.0(1)M2
Cisco 886VA Integrated Services Router	15.0(1)M2
Cisco 887VA Integrated Services Router	15.0(1)M2
Cisco 892F Integrated Services Router	15.1(2)T2
Cisco Catalyst 4948E-F Switch	12.2(54)WO
Cisco Catalyst 6506 Switch	12.2(33)SXI4
Cisco Catalyst 6509-NEB Switch	12.2(33)SXI4
Cisco Catalyst 6509 Switch	12.2(33)SXI4
Cisco Catalyst 6504-E Switch	12.2(33)SXI4
Cisco Catalyst 6509-V-E Switch	12.2(33)SXI4
Cisco Catalyst 6513 Switch	12.2(33)SXI4
Cisco Catalyst 6509-NEB-A Switch	12.2(33)SXI4
Cisco Catalyst 6503 Switch	12.2(33)SXI4
Cisco Virtual Switching System	12.2(33)SXI4
Cisco Catalyst C2928-48TC-C Switch	12.2(55)EZ
Cisco Catalyst 2928-24TC-C Switch	12.2(55)EZ
Cisco Catalyst C2928-24LT-C Switch	12.2(55)EZ
Cisco Catalyst 3560CG-8PC-S Compact Switch	12.2(55)EX
Cisco Catalyst 3560CG-8TC-S Compact Switch	12.2(55)EX
Cisco Catalyst 2960CPD-8PT-L Switch	12.2(55)EX
Cisco Catalyst 2960CG-8TC-L Compact Switch	12.2(55)EX
Cisco Enhanced Layer 2 EtherSwitch Service Module	12.2(58)SE
Cisco Enhanced Layer2, Layer3 EtherSwitch Service Module	12.2(53)SE2
Cisco 3945 Integrated Services Router	15.0(1)M2

Getting Started with EnergyWise

The Getting Started workflow guides you on provisioning EnergyWise for Day 1 operations. For advanced configurations you can choose the corresponding link in the EnergyWise TOC.

In LMS 4.1, there are two new options that are part of the Getting Started workflow:

- Upgrading Images of Devices having Lower EnergyWise Image
- Configuring Secrets of Discovered EnergyWise Domains

Upgrading Images of Devices having Lower EnergyWise Image

Some EnergyWise Capable devices might appear as EnergyWise Software Incapable Devices if they do not have the latest EnergyWise Capable IOS image. We recommend you to upgrade to the latest EnergyWise Capable IOS image to avail all the EnergyWise features in LMS 4.1. You can click the link to view the details of these devices and to upgrade to the recommended image version.

When you click the link, the EnergyWise Devices Running Below Recommended Image Version popup appears with the details of the devices like Device Name, IP Address, Subnet Mask, Device Type, Running Image Version, and the Recommended Image Version. You can view this link only if there are any EnergyWise Capable devices running with lower EnergyWise images.

Configuring Secrets of Discovered EnergyWise Domains

LMS collects secrets of domains if they are in plain text, if they are in encrypted format, LMS cannot collect the secrets.

If the secrets are in encrypted format or they are not configured on the device, you can update them in the Manage Domains page. When you click the link in the Getting Started page, the Manage Domains page appears in another tab where you can configure secrets of the domains. You can view this link only if there are any domains that have secrets in the encrypted format, or are not configured in the device.

The Getting Started workflow for EnergyWise is:

1. Assessing EnergyWise Readiness of Your Network
2. Enabling EnergyWise on Devices
3. Configuring EnergyWise Attributes on Endpoints
4. Applying EnergyWise Policies to Endpoints

Assessing EnergyWise Readiness of Your Network

The EnergyWise (EW) readiness assessment in the Getting Started Assistant displays EnergyWise-based device details after assessing your network. A pie chart appears with the following types of devices.

- EnergyWise Enabled Devices
- EnergyWise Capable Devices
- EnergyWise Software Incapable Devices
- EnergyWise Hardware Incapable Devices

Click on any of the pie chart slices to view the details of the devices.

Note You need Adobe flash player 9 or later to display the readiness assessment pie chart. You can install the flash player from LMS. Reload the page after installing the flash player.

EnergyWise Enabled Devices

Click the EnergyWise Enabled devices slice of the pie chart. The details of the corresponding devices appear at the bottom of the page. These devices have the supported IOS image for EnergyWise, and have EnergyWise enabled.

To manage the power consumption of these devices, you need to configure EnergyWise attributes such as Name, Role, Keywords and Importance for the devices and for the endpoints connected to the devices. Select **Work Centers > EnergyWise > Configure > Configure EnergyWise Attributes on Endpoints**.

You will then need to create EnergyWise policies, and endpoint groups for your network. The policies can be applied to endpoints through endpoint groups.

EnergyWise Capable Devices

Click the EnergyWise Capable devices slice of the pie chart. The details of the corresponding devices appear at the bottom of the page. These devices have the supported IOS image for EnergyWise. However, EnergyWise is not enabled on them.

Select one or more device and click **Enable EnergyWise** to enable EnergyWise on the selected devices. See, Enabling EnergyWise on Devices for more details.

EnergyWise Software Incapable Devices

Click the EnergyWise Software Incapable devices slice of the pie chart. The details of the corresponding devices appear in the table at the bottom of the page. These devices do not have the supported IOS image for EnergyWise. You can upgrade to the EW-capable IOS image.

Some EnergyWise Capable devices might appear as EnergyWise Software Incapable Devices if they do not have the latest EnergyWise Capable IOS image. We recommend you to upgrade to the latest EnergyWise Capable IOS image to avail all the EnergyWise features in LMS 4.1.

Select one or more device and click **Upgrade Software Image** to upgrade to the EnergyWise Capable IOS image.

EnergyWise Hardware Incapable Devices

Click the EnergyWise Hardware Incapable devices slice of the pie chart. The details of the corresponding devices appear at the bottom of the page. These devices do not support the EnergyWise technology. You can get the latest EnergyWise supported hardware from Cisco.com. See Known List of Hardware-incapable Devices for more information.

Enabling EnergyWise on Devices

To enable EnergyWise on the EnergyWise Capable devices, go to **Work Center > EnergyWise > Enable EnergyWise on Devices**.

As a best practice, LMS recommends an EnergyWise domain to be restricted to a Layer 2 domain or subnet.

The workflow for configuring EnergyWise on the required devices is:

1. Select devices from the list of EnergyWise Capable devices.

2. Associate devices to an EnergyWise domain.

   To enable EnergyWise on a device, it has to be part of a domain. Select the domain to which you wish to assign the selected devices. See Associating Devices to an EnergyWise Domain for more information.

3. Configure EnergyWise attributes for each device.

   This is an optional step. You can configure EnergyWise attributes like entity name, role, importance, and keyword on the device.

4. Schedule deployment.

   You must schedule a job to deploy the EnergyWise configurations on the EnergyWise-enabled devices. You can view the details of the EnergyWise jobs in the EnergyWise Job Browser (**Work Centers > EnergyWise > Jobs**). See, Scheduling EnergyWise Configuration Jobs for more details.

Associating Devices to an EnergyWise Domain

Select EnergyWise Capable devices and the required domain, to add the devices to the domain. You can also create, edit, and delete EnergyWise domains. See Managing EnergyWise Domain for more information.

You can also click **Filter** to view the EnergyWise domains based on the domain name, description of the domain, or number of devices in the domain.

> **Note** For a successful EnergyWise Endpoint collection, you must configure the EnergyWise secrets like Domain Secret, Endpoint Secret, and Management Secret.

When you select a domain you have to enter the following passwords if they are not configured:

- Domain Secret—Enter the domain secret used by the EnergyWise protocol to enable communication between devices within the domain. You must enter this secret if you do not want EnergyWise operations to be in sync with the NTP server.

- Management Secret—Enter the management secret used by the LMS server to collect data from the devices in the domain.

- Endpoint Secret—Enter the Endpoint secret used by EnergyWise protocol to communicate with the endpoint devices in the domain.

- Network Time Protocol (NTP) Secret—Enter the NTP secret used by the EnergyWise protocol to enable communication between devices in the domain. If you want EnergyWise operations to be in sync with the NTP server, you must enter this secret.

  You must configure NTP server details to ensure correct execution of EnergyWise operations. NTP server synchronization is recommended, as EnergyWise events are time based. You can select the IP Address option and enter the IP address of the NTP server, or select the Host Name option and enter the host name of the NTP server. NTP Server, when configured on a device, synchronizes the system time of the device with the system time of the NTP server.

Note   If you select devices which do not belong to the same subnet, you must manually configure some commands on the device. LMS will manage policies and provide EnergyWise monitoring after you configure the commands on the devices. For more details, see Enabling EnergyWise on Devices in Disjoint Domains.

Enabling EnergyWise on Devices in Disjoint Domains

If devices are in disjoint domains, neighbors might not be discovered automatically. If you want to enable EnergyWise on these devices, you must manually assign one device as a static neighbor or the reverse. You must configure:

```
energywise neighbor <IP Address of the device>
```

For example, Switch A (192.168.1.2) and Switch B (192.168.2.2) are in disjoint domains. To prevent a disjointed domain, you must manually assign Switch 2 as a static neighbor or the reverse on Switch 1. You must configure the following command on Switch A:

```
energywise neighbor 192.168.2.2 43440
```

Configuring EnergyWise Attributes on Endpoints

You can configure EnergyWise attributes on endpoints, which can further be used for defining the Endpoint Group. You can configure EnergyWise attributes like role, keyword, and importance of endpoints. Before you configure EnergyWise attributes on endpoints, see Prerequisites and Important Notes.

Prerequisites

- You must install an EnergyWise client, like Verdiem, Orchestrator, on non-PoE endpoints for them to become EnergyWise endpoints.

Note   EnergyWise in LMS does not support DMP endpoints, as you cannot install the EnergyWise client on these endpoints.

Except for supported images of Catalyst 2K and 3K for EnergyWise (see, EnergyWise Supported Devices and Images), to discover IP phones and manage their power level using all other EnergyWise devices, you must:

- Install the Cisco Call Manager (CCM) in an Application server or MCS.
- Register the IP phones with the CCM. LMS does not support CME.

- The CCM must be managed in the DCR of LMS with the SNMP-RO credentials.

- After LMS discovers and manages CCM, you can trigger Data Collection (**Admin > Collection Settings > Data Collection > Data Collection Schedule**) and User Tracking for IP phones (**Inventory > User Tracking Settings > Acquisition Actions**).

- You can launch the IP phones report (**Reports > Inventory > User Tracking > All IP Phone Entries**). If data appears in the report, the CCM is properly managed and you can proceed with Endpoint Attribute Configuration.

Important Notes

- If an endpoint is connected to a non-PoE port of a device then EnergyWise will not discover the endpoint.

  If an EnergyWise Client or Agent runs in this endpoint, then EnergyWise will discover the endpoint, and LMS will support and manage it.

- If PoE endpoint like VOIP, IPVSC are connected to a PoE port of a device, then EnergyWise will discover the endpoints and LMS will support and manage them.

- If any non-PoE endpoints like Linux, or WinXP machine are connected to a PoE port or a non-PoE port, the endpoints will not get discovered or supported by LMS.

  If EnergyWise Client or Agent runs in these endpoints, then EnergyWise will discover the endpoints and LMS will support and manage them.

To configure EnergyWise endpoints:

Step 1   Select **Work Centers > EnergyWise > Configure > Configure EnergyWise Attributes on Endpoints**. The EnergyWise Endpoint Configuration page appears.

Step 2   Select one or more devices from the Select EnergyWise devices pane.

Click **Filter** to view the EnergyWise devices based on a specific type.

Step 3   Click **Next** to view the Configure EnergyWise Attributes on Endpoints pane. The Configure EnergyWise Endpoints table appears with the following information:

Field	Description
Host Name	Displays the host name of the endpoint.
IP Address	Displays the IP address of the endpoint.
MAC Address	Displays the MAC address of the endpoint.
Device	Shows the display name of the device, as defined in the Device Management page (DCR), to which the endpoint is connected.
Port	Displays the port to which the endpoint is connected.
VLAN	Displays the VLAN to which the endpoint belongs.
Device Type	Displays the type of the endpoint.
Entity Name	Displays the unique name of the endpoint. If you do not specify an entity name, the hostname is taken as the entity name.

Field	Description
Role	Displays the role or function of the device in the EnergyWise domain. By default the model number appears.
Keyword	Displays the word that will help you identify a specific device or group of devices. When assigning multiple keywords, separate the keywords with commas, and do not use spaces between keywords.
Importance	Displays the value of EnergyWise Importance of the endpoint. This value differentiates the endpoints in a domain based on their power usage. For example, a desk phone has a lower importance than a business-critical emergency phone.

You can do one of the following:

- Select an endpoint and click **Configure** to configure its name, role, keyword, and importance.

  If you select only one endpoint, then the attributes will be pre-populated from the device, if they are available. If you select more than one endpoint, then you must configure the attributes.

- Click **Show Details** to view the details of the endpoint.

- Click **Filter** to view the EnergyWise endpoints based on a specific type.

Step 4   Click **Next** to schedule the configurations to the selected endpoints Schedule Deployment pane. For more information, see Scheduling EnergyWise Configuration Jobs.

Scheduling EnergyWise Configuration Jobs

Every configuration is deployed as a job. In many workflows the Schedule Deployment pane appears at the end. It displays details of the schedule and job options.

> **Note** All the EnergyWise jobs except the Apply EnergyWise policies jobs use the NetConfig protocol order. See Defining the NetConfig Protocol Order, for more information.

Table 3-3 describes the fields and options in the Schedule Deployment page.

Table 3-3   Fields in the Schedule Deployment Page Description

Field	Description
Scheduler	Specifies when you want to run the job. Select one of the following: • Immediate—Runs the job immediately. • Once—Runs the job once at the specified date and time.
Job Description	Enter a description for the job. This is mandatory. You can enter alphanumeric and special characters.
E-mail	Enter e-mail addresses to which the job sends messages. You can enter multiple e-mail addresses separated by commas.

Select one of the following:

- Click **Preview CLI** to see the CLI commands that will be applied to the selected devices. You can select a device from the Preview CLI pop-up and see the CLI commands.

  You can modify an instance of a configuration task (and its configuration commands) at any time before the job is scheduled.

- Click **Previous** to go back to the previous panes.

- Click **Finish** after you review the CLI commands.

  A notification message appears along with the Job ID. The newly created job appears in the EnergyWise Job Browser (**Work Center** > **EnergyWise > Jobs**). See Managing EnergyWise Jobs for more details.

Defining the NetConfig Protocol Order

To define or modify the NetConfig protocol order:

Step 1   Select **Admin > Collection Settings > Config > Config Transport Settings**. The Transport Settings page appears.

Step 2   Select NetConfig from the Application drop-down list.

Step 3   Select a protocol from the Available Protocols pane and click **Add**.

If you want to remove a protocol or change the protocol order, you must remove the protocol using the **Remove** button and add the protocol, again.

The list of protocols that you have selected appears in the Selected Protocol Order pane.

Step 4   Click **Apply**.

A message appears, `New settings saved successfully`.

Step 5   Click **OK**.

Applying EnergyWise Policies to Endpoints

To apply EnergyWise policies to endpoints, they have to be part of an EnergyWise endpoint group.

To apply EnergyWise policies to the required endpoint groups, select **Work Centers > EnergyWise > Configure > Apply EnergyWise Policies**.

The workflow for applying EnergyWise policies to the required endpoint group is:

1. Select the endpoint group.

   You can also create, delete, and edit endpoint groups. See Managing EnergyWise Endpoint Groups for more details.

2. Select the EnergyWise policies.

   This is an optional step. You can also create and edit the EnergyWise policies and their events. See Managing EnergyWise Policies, for more details.

3. Apply EnergyWise policies to endpoint groups.

   See Applying EnergyWise Policies to Endpoint Groups, for more details.

4. Schedule deployment.

   You must schedule a job to deploy the EnergyWise configurations to the EnergyWise-enabled devices. You can view the details of the EnergyWise jobs in the EnergyWise Job Browser (**Work Centers > EnergyWise > Jobs**). See, Scheduling EnergyWise Configuration Jobs for more details.

Note   LMS uses the EnergyWise protocol and not the NetConfig protocol order to apply EnergyWise policies to the endpoints.

Applying EnergyWise Policies to Endpoint Groups

You can configure an EnergyWise device to automatically change the power level of an end point. This configuration is called an EnergyWise event. If you configure an event to change the power level of an endpoint, you have to create another event to restore the power level of that endpoint. For example, if you create an event to power down an IP phone at the end of the business day, you need to configure another event to power up the IP phone at the beginning of the next business day.

If there are endpoints that are not part of any endpoint group, click the link to view details of the ungrouped endpoints like name, role, keyword, and importance.

To apply EnergyWise policies to endpoint groups:

Step 1 Select **Work Centers > EnergyWise > Configure > Apply EnergyWise Policies**.

You can view the Endpoint Groups.

Step 2 Click **Next** to view the EnergyWise Policies pane.

Step 3 Click **Next** to view the Apply Policies to Endpoints pane. The pane appears with the following information:

Field	Description
Endpoint Group	Displays the name of the endpoint group.
Entities Count	Displays the number of endpoints in the endpoint group. Click the link to view details of the endpoints.
Non-compliant Entries	Displays the number of non-compliant endpoints in the endpoint group. Click the link to view details of the Non-compliant endpoints. If the power level of an interface is different from that specified in the policy, then the interface is shown as a non-compliant entity.
Policy Applied	Specifies if any EnergyWise policy has been applied to the endpoint group.
Assigned Policies	Specifies the policies that are mapped to an endpoint group.

Step 4 You can do one of the following:

- Select an EnergyWise endpoint group and click **Apply Policy** to apply an EnergyWise policy to the endpoint group.

  The Assign Policy to Endpoint Groups page appears with a list of all the created EnergyWise policies.

  Select a policy and click **Save** to apply the policy to the endpoint group.

- Click **Filter** to view the endpoint groups based on their name, number of endpoints in the endpoint group, or number of non-compliant endpoints in the endpoint group.

- Click **Previous** to go to the Define EnergyWise Policies page.

- Click **Next** to go to the Schedule Deployment page and deploy the job. See Scheduling EnergyWise Configuration Jobs for more information.

Checking EnergyWise Policy Compliance

If there are endpoints that are not part of any endpoint group, click the link to view details of the ungrouped endpoints like name, role, keyword, and importance.

To check the compliance of EnergyWise policies in your network:

Step 1 Select **Work Center > EnergyWise > Configure > Policy Compliance**. The EnergyWise policy compliance status page appears with the details of the endpoint groups:

Field	Description
Endpoint Group	Displays the name of the endpoint group.
Entities Count	Displays the number of endpoints in the endpoint group. Click the number to view details of the endpoints like entity name, role, keyword, and importance.
Non-compliant Entities	Displays the number of non-compliant endpoints in the endpoint group. Click the number to view details of the Non-compliant entities.
	If the power level of an interface is different from that specified in the policy, then the interface is shown as a non-compliant entity.
Policy Applied	Specifies if any EnergyWise policy has been applied to the endpoint group.

Step 2 Click **Filter** to view the endpoint groups based on their name, number of endpoints in the endpoint group, or number of non-compliant endpoints in the endpoint group.

Managing EnergyWise Devices

You can configure the unique EnergyWise device attributes like entity name, role, keyword, importance for the managed EnergyWise devices in the network. You can also change the domain of the EnergyWise device.

For domains for which LMS does not know the secrets, you can select the Enable Encryption of Secrets check box to encrypt secrets, and enter the secrets.

Note Disabling the check box will display the secrets in unencrypted format in the device running configuration.

To manage EnergyWise devices:

Step 1 Select **Work Center > EnergyWise > Configure > Manage Devices**. The Configure Unique EnergyWise Attributes page appears with a list of managed EnergyWise devices.

The Configure Unique EnergyWise Device Attributes page appears with details of the device like Device Name, IP Address, Domain, Entity Name, Role, Keyword, and Importance.

Step 2 To edit the device attributes, select a device and click **Edit**. The Configure Unique Device Attribute page appears with the details mentioned in the table below. You can view and modify the required details. Some of the fields will appear only if there are no secrets configured in the domain.

Field	Description
Device Name	Name of the device.
Domain	From the drop-down list, select a domain to which the device should belong.
Enable Encryption of Secrets	Select the check box to encrypt secrets. **Note** Disabling the check box will display the secrets in unencrypted format in the device running configuration.
Do you want EnergyWise operations to be in sync with NTP server?	Click **Yes** if you want EnergyWise operations to be in sync with the NTP serve. You must configure NTP Secret along with the Management Secret, and Endpoint Secret. Click **No** if you do not want EnergyWise operations to be in sync with the NTP server. You must enter the Domain Secret along with the Management Secret, and Endpoint Secret.
Domain Secret	Enter the domain secret used by the EnergyWise protocol to enable communication between devices within the domain. You can enter alphanumeric characters and symbols such as. , and_. Do not enter an asterisk (*) or a blank space between the characters and symbols. You must enter this secret if you do not want EnergyWise operations to be in sync with the NTP server.

Field	Description
Management Secret	Enter the management secret used by the LMS server to collect EnergyWise data from the devices in the domain.
	You can enter alphanumeric characters and special characters like #, (, $,!, and &. Do not enter an asterisk (*) or a blank space between the characters and symbols.
Endpoint Secret	Enter the endpoint secret used by EnergyWise protocol to communicate with the endpoint devices in the domain.
	You can enter alphanumeric characters and special characters like such as #, (, $,!, and &. Do not enter an asterisk (*) or a blank space between the characters and symbols.
NTP Secret	Enter the NTP secret used by the EnergyWise protocol to enable communication between devices in this domain.
	You can enter alphanumeric characters and special characters like such as #, (, $,!, and &. Do not enter an asterisk (*) or a blank space between the characters and symbols.
	If you want EnergyWise operations to be in sync with the NTP server, you must enter this secret.
Entity Name	Specify a unique name for the device. If you do not specify an entity name, the hostname is taken as the entity name.
Role	Specify the role or function of the device in the EnergyWise domain.
	For a PoE port, the default is interface.
	For a switch, the default is the model number.
Keyword	Specify a word that will help you identify a specific device or group of devices.
	When assigning multiple keywords, separate the keywords with commas, and do not use spaces between keywords.
Importance	Displays the value of EnergyWise Importance of the device.
	This value differentiates the devices in a domain based on their power usage. For example, a desk phone has a lower importance than a business-critical emergency phone.

Step 3   Click **Save**, or **Save and Edit Next**, or **Cancel**.

Step 4   You can do one of the following:

- Click **Filter** to view the EnergyWise devices based on a specific type.
- Select a device and click **Import** to import the device attributes.

    Use the **Browse** button to select the file to the device attributes.

- Select a device and click **Export** to export the device attributes. The file will be in CSV format.
- Select a device and click **Edit** to edit the device attributes.

Note   If you select devices which do not belong to the same subnet, you must manually configure some commands on the device. LMS will manage policies and provide EnergyWise monitoring after you configure the commands on the devices. For more details, see Enabling EnergyWise on Devices in Disjoint Domains.

Enabling EnergyWise on Devices in Disjoint Domains

If devices are in disjoint domains, neighbors might not be discovered automatically. If you want to enable EnergyWise on these devices, you must manually assign one device as a static neighbor or the reverse. You must configure:

```
energywise neighbor <IP Address of the device>
```

For example, Switch A (192.168.1.2) and Switch B (192.168.2.2) are in disjoint domains. To prevent a disjointed domain, you must manually assign Switch 2 as a static neighbor or the reverse on Switch 1. You must configure the following command on Switch A:

```
energywise neighbor 192.168.2.2 43440
```

Managing EnergyWise Domain

An EnergyWise domain consists of Cisco domain members and end points. A domain can represent a geographic location, a specific place in the network, or any energy specific logical representation.

The domain members forward messages to other members and to end points. Neighbor relationships are set among the domain members (EnergyWise-enabled devices). Each domain member also sets up a parent-child relationship with an attached end point. The child is one of the end points, and the parent is the domain member.

For example, if you have a building with 10 access switches, and 400 end points, such as phones, access points, and PCs running the end point SDK, you can create an EnergyWise domain called *MyBuilding* with the switches as domain members.

When the devices are added in DCR, and EnergyWise collection is successful, the domains present in the EnergyWise Enabled device will be discovered, and the secrets of the domain will be discovered as part of a successful config collection.

You can view all the configured EnergyWise domains. You can also create, and edit EnergyWise domains.

To manage the configured EnergyWise domains:

Step 1   Select **Work Center** > **EnergyWise** > **Configure** > **Manage Domains**. The Managed EnergyWise Domain page appears with the following details.

Field	Description
Domain Name	Displays the name of the domain.
Description	Displays a description about the domain.
No. of Devices	Displays the number of endpoints in the domain.
	When you click on the count, the Device Details for EnergyWise Domain pop-up appears. You can get the details of the devices like device name, IP address, device type, and running image version.
Does LMS know secret	Specifies if LMS knows the domain secret.
	If LMS does not know the domain secret, you can only:
	• Perform EnergyWise device collection.
	If LMS does not know the domain secret, you cannot:
	• Monitor endpoints.
	• Apply EnergyWise policies on endpoints.
	• Perform endpoint collection
	• Check EnergyWise policy compliance.
	LMS collects secrets of domains only if they are in plain text, if they are in encrypted format, LMS will not collect the secrets. If the secrets are in encrypted format or they are not configured on the device, you can select the domain and click **Edit** and update the secrets.

Step 2   You can do one of the following:

- Click **Create** to create an EnergyWise domain. See, Creating EnergyWise Domain for more information.

- Select an EnergyWise domain and click **Edit** to edit it. While editing the domain details, you can click the link, **Click here to view the secrets**, to view the masked secrets in the View EnergyWise Secrets popup.

- Select an EnergyWise domain and click **Delete** to delete an EnergyWise domain. You can only delete domains that do not have any members.

- Click **Filter** to view the EnergyWise domains based on a specific type.

Creating EnergyWise Domain

To create an EnergyWise domain:

Step 1   Select **Work Center** > **EnergyWise** > **Configure** > **Manage Domains**. The Managing EnergyWise Domain page appears.

Step 2   Click **Create**. The Create Domain page appears with the following details.

Field	Description
Domain Name	Enter the name of the domain. You can enter alphanumeric characters.
Description	Enter a description about the domain. You can use a maximum of 256 characters.
Enable Encryption of Secrets	Select the check box to encrypt secrets. **Note** Disabling the check box will display the secrets in unencrypted format in the device running configuration.
Do you want EnergyWise operations to be in sync with NTP server?	Click **Yes** if you want EnergyWise operations to be in sync with the NTP serve. You must configure NTP Secret along with the Management Secret, and Endpoint Secret. You can select the IP Address option and enter the IP address of the NTP server, or select the Host Name option and enter the host name of the NTP server. Click **No** if you do not want EnergyWise operations to be in sync with the NTP server. You must enter the Domain Secret along with the Management Secret, and Endpoint Secret.
Click here to view the secrets (link)	Click this link to view the configured secrets in the View EnergyWise Secrets popup. LMS collects secrets of domains only if they are in plain text, if they are in encrypted format, LMS cannot collect the secrets. If the secrets are in encrypted format or they are not configured on the device, you can update it in this page, or in the **Edit** page. If you want to deploy the updated secrets to the EnergyWise devices, go to the Manage Devices page.
Domain Secret	Enter the domain secret used by the EnergyWise protocol to enable communication between devices within the domain. You can enter alphanumeric characters and symbols such as. , and_. Do not enter an asterisk (*) or a blank space between the characters and symbols. You must enter this secret if you do not want EnergyWise operations to be in sync with the NTP server.
Management Secret	Enter the management secret used by the LMS server to collect EnergyWise data from the devices in the domain. You can enter alphanumeric characters and special characters like #, (, $,!, and &. Do not enter an asterisk (*) or a blank space between the characters and symbols.

Field	Description
Endpoint Secret	Enter the endpoint secret used by EnergyWise protocol to communicate with the endpoint devices in the domain.
	You can enter alphanumeric characters and special characters like such as #, (, $,!, and &. Do not enter an asterisk (*) or a blank space between the characters and symbols.
Network Time Protocol (NTP) Server	You must configure NTP server details to ensure correct execution of EnergyWise operations.
	NTP server synchronization is recommended, as EnerygWise events are time based.
	You can select the IP Address option and enter the IP address of the NTP server, or select the Host Name option and enter the host name of the NTP server.
	NTP Server, when configured on a device, synchronizes the system time of the device with the system time of the NTP server.
NTP Secret	Enter the NTP secret used by the EnergyWise protocol to enable communication between devices in this domain.
	You can enter alphanumeric characters and special characters like such as #, (, $,!, and &. Do not enter an asterisk (*) or a blank space between the characters and symbols.
	If you want EnergyWise operations to be in sync with the NTP server, you must enter this secret.

Step 3 Click **Save** or **Save and Add Another**.

Managing EnergyWise Endpoint Groups

You can create endpoint groups based on certain filters like role, importance, and keywords. The endpoints can be part of one or more domains. After you create an endpoint group, you can apply policies to the group.

You must create EnergyWise domains before creating endpoint groups. To create domains, select **Work Centers > EnergyWise > Configure > Manage Domains**.

For example, you can create an endpoint group of IP phones in a floor based on their role, importance, and keyword called *FirstfloorIPphones*. The IP phones can be part of different domains. You can create a policy to switch on and switch off the phones at specified periods, and apply the policy to the endpoint group.

To create an Endpoint Group:

Step 1   Select **Work Center > EnergyWise > Configure > Manage Endpoint Groups**. The Manage Endpoint Group page appears with the following details.

Field	Description
Endpoint Group	Displays the name of the endpoint group.
Entity Count	Displays the number of endpoints in the group.
Non Compliant Entities	Displays the number of non-compliant endpoints in the group.
	Click the count to view the details of non-compliant endpoints in the endpoint group.
	A non-compliance occurs when the power level of an interface is different from that specified in the policy, then the interface is shown as a non-compliant entity.
Policy Applied	Specifies if an EnergyWise policy has been applied to the endpoint group.
Monitoring Information	Specifies if power usage is monitored at a specified interval.

Step 2   You can do one of the following:

- Click **Create** to create an EnergyWise endpoint group. See, Creating EnergyWise Endpoint Groups for more information.

- Select an EnergyWise endpoint group and click **Edit** to edit it.

- Select an EnergyWise endpoint group and click **Delete** to delete it.

- Select an endpoint group and click **Monitor Settings**. You have the following options:

    – Click **Enable Monitoring** to enable the monitor settings of the endpoint group.

    – Click **Disable Monitoring** to disable the monitor settings of the endpoint group.

    – Click **Edit** to edit the monitor settings of the endpoint group. The Edit Monitor Settings page appears.

    You can monitor power usage of the endpoint group for a specific interval, and configure the threshold settings of the power usage of the endpoint group.

- Select an EnergyWise endpoint group and click **Apply Policies** to select an EnergyWise policy and apply it on the EnergyWise endpoint group.

- Click **Filter** to view the EnergyWise endpoint groups based on a specific type.

- You can also view the list of the endpoints that are not part of any endpoint group.

Note   After you create or edit an EnergyWise endpoint group, go to **EnergyWise > Apply EnergyWise Policies** to apply the EnergyWise policies to endpoint groups.

Creating EnergyWise Endpoint Groups

To create an Endpoint Group:

Step 1   Select **Work Center > EnergyWise > Configure > Manage Endpoint Groups**. The Manage Endpoint Group page appears.

Step 2   Click **Create**. The Create Endpoint Group page appears with the following details.

Field	Description
Name	Enter the name of the endpoint group.
	Group Name can contain alphanumeric characters and special characters like hyphen(-), underscore(_), and period(.). You cannot use blank spaces in Group Names.
Description	Enter a description about the endpoint group.
Domains	From the list, select an EnergyWise domain. You can use the Ctrl key to select multiple domains.
	You can view the Roles, Importance, and Keywords according to the domains that you select here. These fields will be used as filters to select the endpoints that will be part of the endpoint group.
Role	The roles available for the selected domains are displayed. Select the required role from the drop-down list.
Importance value less than or equal to	The importance values available for the selected domains are displayed here. Select the required importance value from the drop-down list.
	This value differentiates the devices in a domain based on their power usage. For example, a desk phone has a lower importance than a business-critical emergency phone.
	LMS will group all the entities having an importance less than or equal to the selected value.
Keywords	The keywords available for the selected domains are displayed. Select the required keywords. You can use the Ctrl key to select multiple keywords.
Auto Push	Select this check box to automatically apply the policies to the newly-discovered endpoints in the endpoint group.
Monitor power usage at every interval	Select this check box to monitor power usage of the endpoint group for a specific interval. You can choose from:
	• 30 minutes
	• 1 hour
	• 2 hours
	• 4 hours
	• 8 hours
	The default value is 30 min.

Step 3   If you want to configure the threshold settings for the endpoint group, select the Monitor power usage at every interval check box, and click the Threshold settings link.

The Threshold settings page appears. See Configuring Threshold Settings for more information.

Step 4 Click **View Applicable Endpoints** to view the endpoints that match the filter values. The Applicable Endpoints popup appears with the list of endpoints that belong to the selected domains and have the selected role, keyword, and importance.

Step 5 Click **Save** to save your settings.

✎

Note After you create an EnergyWise endpoint group, go to **EnergyWise > Configure > Apply EnergyWise Policies** to apply the EnergyWise policies to endpoint groups.

Configuring Threshold Settings

You can configure the threshold settings of the power usage of endpoint groups.

You can set the power consumption threshold, which when violated, generates a trap, generates a syslog of a specified severity, sends notifications to the specified mail IDs and executes the specified commands.

You can set the threshold as a percentage of the average power consumed over a specified period. The trap receiver groups that you configure in **Admin > Network Administration > Notification & Action Settings > Performance - SNMP Trap notification**, will receive traps when the violation occurs.

To configure the threshold settings of endpoint groups:

Step 1 Select **Work Center > EnergyWise > Configure > Manage Endpoint Groups**. The Manage Endpoint Group page appears.

Step 2 You can do one of the following:

- Click **Create**. The Create Endpoint Group page appears. Select the Monitor power usage at every interval check box and click the link that appears.

- Select an endpoint group and click **Edit**. The Edit Endpoint Group page appears. Select the Monitor power usage at every interval check box and click the link that appears.

- Select an endpoint group and click **Monitor Settings** and click **Edit** to edit the monitor settings of the endpoint group. The Edit Monitor Settings page appears.

  The Threshold Settings page appears with the following details.

Field	Description
Threshold	Enter the threshold value, expressed as a percentage of the average power consumed over a specified duration. Enter any number between 1 and 100.
Last	Select the duration from the drop-down list. The average power consumed over the duration specified here is considered for calculating the threshold violation. The options are: • Week • Month • Quarter

Field	Description
Severity	From the drop-down list, select the severity to create a trap. You can choose from: • Low • Medium • Critical
Trap	From the drop-down list, select the trap receiver groups that will receive traps when there is a threshold violation. You can configure the trap receiver groups using **Admin > Network > Notification and Action Settings > Performance - SNMP Trap notification**.
Syslog	From the drop-down list, select the syslog to be generated when there is a threshold violation.
Severity	Select the severity of the syslog from the drop-down list. You can choose from: • Alert—Severity level 1 • Critical—Severity level 2 • Debug—Severity level 7 • Emergency—Severity level 0 • Error—Severity level 3 • Informational—Severity level 6 • Notice—Severity level 5 • Warning—Severity level 4
Email ID	Enter an email ID to send e-mail notification to a user. You can enter multiple email ids, separated by a comma.
Script	Click **Browse** to choose a file, from the client, that contains the commands to be executed when there is a threshold violation.

Step 3   Click **Apply** to save your settings or **Reset** to reset the values.

Managing EnergyWise Policies

You can configure EnergyWise policies, a set of recurring events, to manage the power usage of devices in the network. In LMS, you can create EnergyWise policies and map them to any endpoint group.

To manage the EnergyWise policies:

Step 1   Select **Work Center** > **EnergyWise > Configure > Manage Policies**. The Managing EnergyWise Policies page appears with the following details.

Field	Description
Policy Name	Displays the name of the policy.
Description	Displays the description about the policy.
Event Count	Displays the number of events associated with the policy. Click the number to view the event details.

Step 2   You can do the following:

- Click **Create** to create an EnergyWise policy. See Adding EnergyWise Policies for more information.

- Select a policy and click **Edit** to modify an EnergyWise policy. You can edit policies associated with endpoint groups.

- Click **Delete** to delete an EnergyWise policy. You cannot delete policies associated with endpoint groups.

Note   After you create or edit an EnergyWise policy, go to **EnergyWise > Configure > Apply EnergyWise Policies** to apply these policies to endpoint groups.

Adding EnergyWise Policies

You can configure an EnergyWise endpoint to power an end point on and off, or change the power level to any value from one to ten, thereby, automatically managing power usage. This configuration acts on the endpoint as an EnergyWise event. For more details on the EnergyWise power levels, see EnergyWise Level.

For example, LMS allows you to configure an EnergyWise event on a switch to control devices in offices to go to power level standby at 8pm and power level full at 7am.

An EnergyWise policy consists of one or more EnergyWise events. You can create EnergyWise policies and apply them to any endpoint group. You can create events while you create a policy. An event occurs when the importance of the event is less than or equal to the importance value of the endpoint.

To add EnergyWise policies:

Step 1   Select **Work Center > EnergyWise > Configure > Manage Policies**. The Managing EnergyWise Policies page appears.

Step 2   Click **Create** to create an EnergyWise policy. The Create Policy page appears with the following details.

Field	Description
Policy Name	Enter the name of the policy.
Policy Description	Enter a description about the policy.
EnergyWise Event	
Importance	Displays the value of EnergyWise Importance. An event occurs when the importance of the event is less than or equal to the importance value of the endpoint. The range is from 1 to 100, where a value of 1 is the lowest and a value of 100 is the highest.
Power Level	Displays the EnergyWise power level. This level specifies the power state of the endpoint at the defined time.
Hour	Displays the hourly interval of the event recurrence. The range is from 0 to 23 hours.
Minutes	Displays the minute interval of the event recurrence. The range is from 0 to 59 minutes.
Days of the Week	Displays the days of the week when the event recurs.

Step 3   Click **Save** to save your settings.

Step 4   You can do the following:

- Click **Add Event** to create EnergyWise events. See Configuring EnergyWise Events for more information.
- Click **Filter** to view the EnergyWise policies based on a specific type.

:

Configuring EnergyWise Events

You can configure an EnergyWise-capable switch to power an end point on and off (or any EnergyWise power level), automatically managing power usage. This configuration acts on the endpoint as an EnergyWise event.

After you configure an EnergyWise event, it is applied on the endpoint when the importance of the event is less than or equal to the importance value of the endpoint.

For example, you can create an event to switch off (power level is zero) an endpoint, with an importance of 2, at 7 am every weekday.

To configure EnergyWise events:

Step 1   Select **Work Center** > **EnergyWise** > **Configure** > **Manage Policies**. The Managing EnergyWise Policies page appears.

Step 2   Click **Create** to create an EnergyWise policy. The EnergyWise Policy Configuration page appears.

Step 3   Enter the name and description of the EnergyWise policy. You must create an event. After you create an event, you can click **Delete** to delete the configured EnergyWise event.

Step 4   Click **Add Event** to create an EnergyWise event.

> **Note**   If EnergyWise is not running on the end point (such as a PoE end point), the specified times are based on the switch time zone. If a daemon is running on the end point, the specified times are based on the end point time zone.

The EnergyWise Event Configuration page appears with the following details:

Field	Description
EnergyWise Level	Select the EnergyWise power level from the slider. This level indicates the power state of an entity.
	The range is from 0 to 10. The default power level is 0. A Cisco switch does not support level 0 as you cannot turn off it's power.
	Select one of the following:
	• 0 - Shut Down
	• 1 - Hibernate
	• 2 - Sleep
	• 3 - Standby
	• 4 - Ready
	• 5 - Low
	• 6 - Frugal
	• 7 - Medium
	• 8 - Reduced
	• 9 - High
	• 10 - Full
Importance	Enter the value for EnergyWise Importance.
	An EnergyWise event is applied on the endpoint when the importance of the event is less than or equal to the importance value of the endpoint. The range is from 1 to 100, where a value of 1 is the lowest and a value of 100 is the highest.

Field	Description
Hours and Minutes	Specify the start time of the event. You can select the hourly time between 0 and 23 hours. You can select the minute interval between 0 and 59 minutes.
Days of the Week	Select the day of the week by selecting the check box. The event will occur on the specified days every month.

Step 5   You can do the following:

- Click **Save Event** to save your settings.
- Click **Save and Add Another** to save your settings and add another event.

Managing EnergyWise Jobs

You can browse the EnergyWise jobs that are deployed on the system. Using the EnergyWise Job Browser you can manage EnergyWise jobs; you can retry, stop, or delete jobs using this job browser.

To invoke the EnergyWise job browser:

Select **Work Center > EnergyWise > Jobs**.

The EnergyWise job browser appears with a detailed list of all EnergyWise jobs. The browser has the following information:

Column	Description
Job ID	Unique number assigned to job when it is created. Click on the hyperlink to view the Job details (see Viewing Job Details).
Status	Status of the job: • Successful—When the job is successful. • Failed—When the job has failed. The number, within brackets, next to Failed status indicates the count of the devices that had failed for that job. This count is displayed only if the status is Failed. For example, If the status displays Failed (5), then the count of devices that had failed is 5. • Stopped—When the job has been stopped. • Running—When the job is in progress.
Description	Description of the job, entered at the time of job creation.
Owner	Username of the job creator.
Scheduled at	Date and time at which the job was scheduled.
Completed at	Date and time at which the job was completed.

Column	Description
Schedule Type	Type of job schedule—Immediate, Once.
Job Type	The different types of EnergyWise jobs are: • EnergyWise—EnergyWise device level jobs • EnergyWise Domain—EnergyWise endpoint level jobs. • EnergyWise Monitoring—Jobs scheduled for generating EnergyWise Cost Saving Report or EnergyWise Power Usage Report. • EnergyWise Data Purge—Jobs scheduled for purging EnergyWise data.

You can filter the jobs displayed in the EnergyWise Job Browser using any of the following criteria and clicking **Filter**. When you click **Filter**, you can select any of the following criteria from the Filter by drop-down list, enter the details in the textbox, and click **Go**.

Filter Criteria	Description
Job ID	Select Job ID and enter the Job IDs that you want to display. For a non-periodic job, the specified Job ID appears in the browser. For periodic jobs, all the instances of the selected Job ID will also be displayed in the browser.
Status	Select Status and then enter any one of these: • Successful • Failed • Stopped • Running • Scheduled
Description	Select Description and enter the complete description.
Owner	Select Owner and enter the full name.
Scheduled at	Select Scheduled at and enter the date and time at which the job was scheduled.
Completed at	Select Completed at and enter the date and time at which the job was completed.
Schedule Type	Select Schedule Type and enter any one of these: • Immediate • Once
Job Type	Select Job Type and enter any one of these: • EnergyWise • EnergyWise Domain • EnergyWise Monitoring • EnergyWise Power Usage Report. • EnergyWise Data Purge

You can click Refresh icon to refresh the EnergyWise job browser, and Refresh Job icon to refresh the selected EnergyWise job.

Records for all EnergyWise jobs need to be purged periodically. You can schedule a default purge job for all EnergyWise monitoring jobs using **Work Centers > EnergyWise > Settings > Purge**.

You can perform the following operations using the EnergyWise job browser. (See Table 3-4):

Table 3-4   Operations Using the EnergyWise Job Browser

Button	Description
Stop	Stops or cancels a running job.
	You can stop or cancel a running job. You will be asked to confirm the cancellation of the job.
	However, the job will be stopped only after the devices currently being processed are successfully completed. This is to ensure that no device is left in an inconsistent state.
	Click **OK** to cancel all instances.
	If you click **Cancel**, only the selected instance of the job is cancelled. The next instance of the job will appear in the Job browser with the status `Scheduled`.
	Unless you own the job, your login determines whether you can use this option. You cannot re-start the stopped job.
Delete	Deletes the selected job from the job browser. You can select more than one job to delete.
	Click **OK** to confirm the deletion. The job, and its instances will be deleted.
	You can delete a job that has been successful, failed, or stopped, but you cannot delete a running job.
	Unless you own the job, your login determines whether you can use this option. You must stop a running job before you can delete it.
Refresh	Refreshes the EnergyWise job browser.
Refresh Job	Refreshes the job and you can see the current status of the job.

Viewing Job Details

From the Job Browser dialog box, you can learn more about any job by viewing its details.

The Job Details appears below the list of EnergyWise jobs details are grouped into three parts:

- Work Order
- Device Details
- Job Summary

Page/Folder	Description
Work Order	Displays general information about the job: • Job policies • Job details

Device Details	Contains detailed job results for each device in a table:
	
	• Device—List of devices on which the job was scheduled.
	
	• Status—Status of job (success, failure, etc.)
	
	• Message Summary—A message about the status of a job.
	
	  – If the job failed on the device, the reason for failure is displayed.
	
	  – If the job was a success on that device, the message `Deploy Successful` is displayed.
	
	You can filter the devices by selecting a status or message summary and clicking **Filter**.
	
	This page displays the number of rows you have set for display in the Rows per Page field. You can increase the rows up to 500 in each page.
	
	You can navigate among the pages of the report using the navigation icons at the right bottom of this table.
	
	Select a device and click **Show Details** to view the details such as protocol, status and reason when applicable, task used and the CLI output for that device. These details appear in a pop-up window.
	
	Note Device details will not appear for any EnergyWise Monitoring jobs as they occur only for endpoint groups.

Job Summary	Click to display summary of completed job:
	
	• Job Summary:
	  – Status
	  – Start Time
	  – End Time
	
	• Job Messages:
	  – Pre-job Execution
	  – Post-job Execution
	
	• Device Update:
	  – Successful
	  – Failed
	  – Not attempted
	  – Pending
	
	Note Job Summary will not appear for any EnergyWise Monitoring jobs as they occur only for endpoint groups.

Monitoring EnergyWise

You can monitor the EnergyWise-related information in your network using EnergyWise portlets and reports. For more information on EnergyWise portlets, see Understanding the EnergyWise Dashboard.

Generating EnergyWise Reports

You can view the EnergyWise report using **Work Centers > EnergyWise > Reports**.

You can monitor EnergyWise using the following reports:

- EnergyWise Device Power Usage
- EnergyWise Port Power Usage
- EnergyWise Power Usage Report
- EnergyWise Cost Saving Report

For more information see *Technology Reports in Reports Management with Cisco Prime LAN Management Solution 4.1 User Guide*.

Configuring EnergyWise Settings

You can configure the following EnergyWise settings:

- Configuring EnergyWise Collection Settings
- Viewing Device Collection Summary
- Viewing Endpoint Collection Summary
- Viewing Compliance Check Summary
- Configuring EnergyWise Cost Settings
- Configuring EnergyWise Data Purge Settings

Configuring EnergyWise Collection Settings

You can configure the time to perform EnergyWise Device Collection, EnergyWise Endpoint Collection, EnergyWise Compliance Check from a specified set of values. If you want to immediately start any of the above EnergyWise collection, select **Work Centers > EnergyWise,** click **Collection Summary** from the Navigator on the left, and start the required EnergyWise collection.

To configure EnergyWise settings:

Step 1   Select **Work Center > EnergyWise > Settings > General**. The EnergyWise Settings page appears.

Step 2   Configure the time to perform EnergyWise Device Collection, EnergyWise Endpoint Collection, EnergyWise Compliance Check. You can choose the time for each EnergyWise collection from:

- 4 hours
- 8 hours
- 12 hours
- 24 hours
- 48 hours

Step 3   Click **Save** to save your settings or **Reset** to reset the settings.

Configuring EnergyWise Cost Settings

To configure EnergyWise cost settings:

Step 1   Select **Work Centers > EnergyWise > Settings > Cost Savings**. The EnergyWise Monitoring Cost Settings page appears.

Step 2   Select the currency from the drop-down list.

Step 3   Specify the cost per kwh.

Step 4   You can:

- Click **Save** to save your changes.
- Click **Clear** to reset the values.

Configuring EnergyWise Data Purge Settings

To configure EnergyWise data purge settings:

Step 1   Select **Work Centers > EnergyWise > Settings > Purge**. The EnergyWise Monitoring Data Purge Settings page appears.

Step 2   Configure the purge schedule.

- Run Type: Select the frequency at which the job should be scheduled.

    - Hourly—Runs hourly at the specified time.

    - Daily—Runs daily at the specified time.

    - Weekly—Runs weekly on the specified day of the week and at the specified time.

    - Monthly—Runs monthly on the specified day of the month and at the specified time. (A month comprises 30 days).

        For periodic jobs, the subsequent instances of jobs will run only after the earlier instance of the job is complete.

        For example, if you have scheduled a daily job at 10:00 a.m. on November 1, the next instance of this job will run at 10:00 a.m. on November 2, only if the earlier instance of the November 1 job has completed. If the 10.00 a.m. November 1 job has not completed before 10:00 a.m. November 2, then the next job will start only at 10:00 a.m. on November 3.

- Start Date: Click on the date picker icon and select the date, month, and year.

    - Your selection appears in the Date field in this format:dd Mmm yyyy (example: 14 Nov 2004).

    - Select the time (hh and mm) from the drop-down lists in the at field.

Step 3   Configure the EnergyWise Purge Policy. Specify the number of days in the **EnergyWise monitoring records older than** field.

Only the records older than the number of days that you specify here, will be purged. The default value is 365 days. This is a mandatory field.

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Caution   You might delete data by changing these values. If you change the number of days to values lower than the current values, messages over the new limits will be deleted.

If the data of a particular day is being accessed either through Immediate reports, Report jobs, or by any other means, it will not be purged. However, during the successive purge operations this data will be purged.

Step 4   You can:

- Click **Purge Now** to purge the EnergyWise data.

- Click **Reset** to reset the values.

Viewing EnergyWise Collection Summary

You can view a summary of the EnergyWise collection from devices, and endpoints. Select **Work Centers > EnergyWise**, click the **Collection Summary** link from the Navigator on the left. For a successful EnergyWise Endpoint collection, you must configure the EnergyWise secrets like Domain Secret, Endpoint Secret, and Management Secret.

Device Collection

Device Collection gathers the EnergyWise domain and device level EnergyWise attributes.The device level EnergyWise attributes such as, Name, Role, Keywords, EnergyWise level, and importance will be collected from CISCO-ENERGYWISE-MIB with the help of SNMP RO.

To know more about the frequency of the Device Collection, See Configuring EnergyWise Collection Settings.

Endpoint Collection

Endpoint Collection attributes such as, Name, Role, Keywords, Importance, Device Type, and Power Usage category are collected using domain level EnergyWise toolkit queries (MAPI).

> **Note** For EnergyWise Endpoint collection and Compliance Check, you need to update the secrets of domain if it is not updated in Manage Domains (**Work Center > EnergyWise > Configure > Manage Domains**) feature.

Compliance Check

Once the EnergyWise policies are applied to Endpoint Groups through LMS, the Compliance Check collects the EnergyWise recurrence (EnergyWise Events) details from each endpoint based on the domain names.

The collected EnergyWise recurrence (EnergyWise Events) details are compared with the Applied EnergyWise Polices in LMS. Based on the mismatch in the EnergyWise Events, Compliance Check produces the non-compliance details for each endpoint.

The different types of EnergyWise summary are:

- Viewing Device Collection Summary
- Viewing Endpoint Collection Summary
- Viewing Compliance Check Summary

Viewing Device Collection Summary

You can view the summary of EnergyWise device collection and start the collection for any device, if required. By default, the EnergyWise device collection will occur at the time specified in **Work Centers > EnergyWise > Settings >General**.

To view the summary of EnergyWise device collection:

Step 1   Select **Work Centers > EnergyWise**.

Step 2   Click the **Collection Summary** link from the Navigator on the left. The EnergyWise Collection Summary page appears.

The EnergyWise Device Collection Summary table has the following details:

Field	Description
Device Name	Displays the name of the device.
Domain Name	Displays the name of the domain.
EnergyWise Type	Specifies the state of EnergyWise in the device. It can be: • Software-incapable—Specifies that the device does not have EnergyWise-capable IOS image. You can go to **Work Centers > EnergyWise > Readiness Assessment**, and upgrade to the EnergyWise-capable IOS image • Enabled—Specifies that EnergyWise is enabled on the device. • Disabled—Specifies that EnergyWise is disabled on the device.
Last Collection Time	Displays the time at which the collection was completed.
Last Collection Status	Displays the status of the collection. It can be: • Running • Success • Failure
Last Collection Message	Displays the collection message after a collection.

Step 3   Select a device and click **Collect EnergyWise** to start the EnergyWise device collection.

Viewing Endpoint Collection Summary

You can view the summary of EnergyWise endpoints collection and start the collection for any device, if required. By default, the EnergyWise endpoints collection will occur at the time specified in **Work Centers > EnergyWise > Settings >General**.

Note   For a successful EnergyWise Endpoint collection, you must configure the EnergyWise secrets like Domain Secret, Endpoint Secret, and Management Secret.

To view the summary of EnergyWise endpoints collection:

Step 1   Select **Work Centers > EnergyWise**.

Step 2   Click the **Collection Summary** link from the Navigator on the left. The EnergyWise Collection Summary page appears.

Step 3   The EnergyWise Endpoint Collection Summary table has the following details:

Field	Description
Domain Name	Displays the name of the domain.
No. of Devices	Displays the number of EnergyWise-enabled devices in the domain.
	Click the count to view details of the devices in the Device Details popup.
No. of Endpoints	Displays the number of endpoints in the domain.
	Click the count to view details of the endpoints in the Endpoints Details popup.
Last Collection Time	Displays the time at which the collection was completed.
Last Collection Status	Displays the status of the collection. It can be:
	• Running
	• Success
	• Failure
Last Collection Message	Displays the collection message after a collection.

Step 4 Select a domain and click **Collect Endpoints** to start the EnergyWise endpoints collection.

Step 5 Select a domain and click **Clear Endpoint Cache** to clear the endpoints of the domains from the cache of the EnergyWise devices.

In an EnergyWise endpoint, if you do not use the Clear Endpoint Cache option, the endpoint entry will remain in the connected EnergyWise device. To clear the cache entry you can use this option. When you click this option, the message `Query submitted for clearing cache of EnergyWise endpoints` appears, which will be reflected in the next endpoint collection in the domain. Hence, the cached endpoint entry will be removed in the next endpoint collection.

Viewing Compliance Check Summary

You can view the summary of EnergyWise policy compliance check and start the compliance check for any endpoint group, if required. By default, the EnergyWise policy compliance check will occur at the time specified in **Work Centers** > **EnergyWise > Settings >General**.

If the power level of an interface is different from that specified in the policy, then the interface is shown as a non-compliant entity.

To view the summary of EnergyWise policy compliance:

Step 1 Select **Work Centers > EnergyWise**.

Step 2 Click the **Collection Summary** link. The EnergyWise Collection Summary page appears.

Step 3 The EnergyWise Compliance Check Summary table has the following details:

Field	Description
Endpoint Group Name	Displays the name of the endpoint group.
No. of Endpoints	Displays the number of endpoints in the domain.
	Click the count to view details of the endpoints in the Endpoints Details popup.
No. of Non-compliant Entities	Specifies the number of non-compliant endpoints.
	Click the count to view the details of the non-compliant endpoints.
	You can view accurate details of non-compliant endpoints only if you have the latest EnergyWise IOS image for the supported devices.
Last Compliance Check Time	Displays the time at which the compliance check was completed.
Last Compliance Check Status	Displays the status of the compliance check. It can be:
	• Running
	• Success
	• Failure
Last Compliance Check Message	Displays the collection message after a compliance check.

Step 4   Select a device and click **Check Compliance** to start the EnergyWise endpoints collection.