



CHAPTER 1

Understanding Cisco EnergyWise

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Note

If your switch is stacking-capable (for example, a Catalyst 3750-X, 3750-E, or 3750), the term *switch* refers to both a standalone switch and a switch stack unless otherwise noted.

For a list of Cisco network devices supporting Cisco EnergyWise, see the *Cisco IOS Release Notes for Cisco EnergyWise, EnergyWise Version 2.7* on Cisco.com.

For Cisco Integrated Service Routers Generation 2 (ISR G2), see the *Configuring Cisco EnergyWise Feature for Branch Routers*:

http://www.cisco.com/en/US/docs/routers/access/1900/software/configuration/guide/enrgyz_artg.html

See Cisco EnergyWise information:

http://www.cisco.com/en/US/products/ps10195/tsd_products_support_series_home.html.

See EnergyWise partner information on the Cisco Developer Network:

<http://developer.cisco.com/web/esdk/home>.



Warning

Voice over IP (VoIP) service and the emergency calling service do not function if power fails or is disrupted. After power is restored, you might have to reset or reconfigure equipment to regain access to VoIP and the emergency calling service. In the USA, this emergency number is 911. You need to be aware of the emergency number in your country

For information about this warning, see the “Important Notice” appendix.

Concepts

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EnergyWise Domain

An EnergyWise domain is treated as one unit of power management. It consists of Cisco networking devices, Power over Ethernet (PoE) endpoints, and endpoints running agents built using the SDK. It is similar to a network-management community such as a VLAN Trunking Protocol (VTP) domain.

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

If you want to implement power management applications on a management station and endpoints, all the domain members must run EnergyWise Version 2.6 or later.

After you enable and configure EnergyWise on the core router and access switches, the *MyBuilding* domain configures itself. Neighbor relationships are set among the domain members.

- Domain members use CDP when it is enabled or EnergyWise UDP messages to automatically discover neighbors.
- You can manually configure static neighbors.

Each domain member sets up a parent-child relationship with an attached endpoint. For example, an IP phone (child) is connected to a PoE switch (parent), or a PC (child) is connected to a router (parent).

After the domain is set, a domain member can forward queries and control messages to other domain members and endpoints.

You can:

- Use SNMP or a management station to query every domain member or endpoint.
- Use the domain member CLI to run an EnergyWise query to receive or set power usage information.
- Use a management application, server, or domain member CLI to define power usage policies and set or receive power usage information.

Power Level

EnergyWise uses a set of power levels to consistently manage power usage. A power level is a measure of the energy consumed by devices in an EnergyWise network. The devices in an EnergyWise network can be from different manufacturers.

Table 1-1 Power Levels

Category	Level	Description
Operational	10	Full
	9	High
	8	Reduced
Standby	7	Medium
	6	Frugal
	5	Low
	4	Ready
	3	Standby
Nonoperational	2	Sleep
	1	Hibernate
	0	Shut off

The range is from 0 to 10.

The default is 10.

A Cisco switch does not support level 0. You cannot turn off the power on a switch.

A PoE endpoint, such as an IP phone, receives power from a PoE switch port.

- The power level is for the port.
- The port supports levels 0 to 10.
- If the port power level is 0, the port does not provide power to connected endpoints.
- If the power level is from 1 to 10, the port is on.

Attributes

Table 1-2 Importance, Keywords, Name, and Role

	Definition	Defaults
Importance	Device rating based on the business or deployment context.	The range is from 1 (least important) to 100 (most important). The default is 1.
Keywords	Device description (other than the name or role) for which query results are filtered.	None.
Name	Device identity for which query results are filtered.	For a PoE port, the short version of the port name. For example, Gi0.2 for Gigabit Ethernet 0/2. For a domain member, the hostname. For an endpoint, see the endpoint documentation. We recommend that you use the hostname.
Role	Device function based on the business or deployment context.	For a PoE port, the default is <i>interface</i> . For a domain member, the default can be the model number or the supervisor model number. For an endpoint, see the endpoint documentation.

Recurrences

You can configure the domain member to power an endpoint or interface on and off based on the time or date.

A recurrence uses the domain member time.

Changes to the EnergyWise power level because of a recurrence exist only in the running configuration and are not saved in the startup configuration.

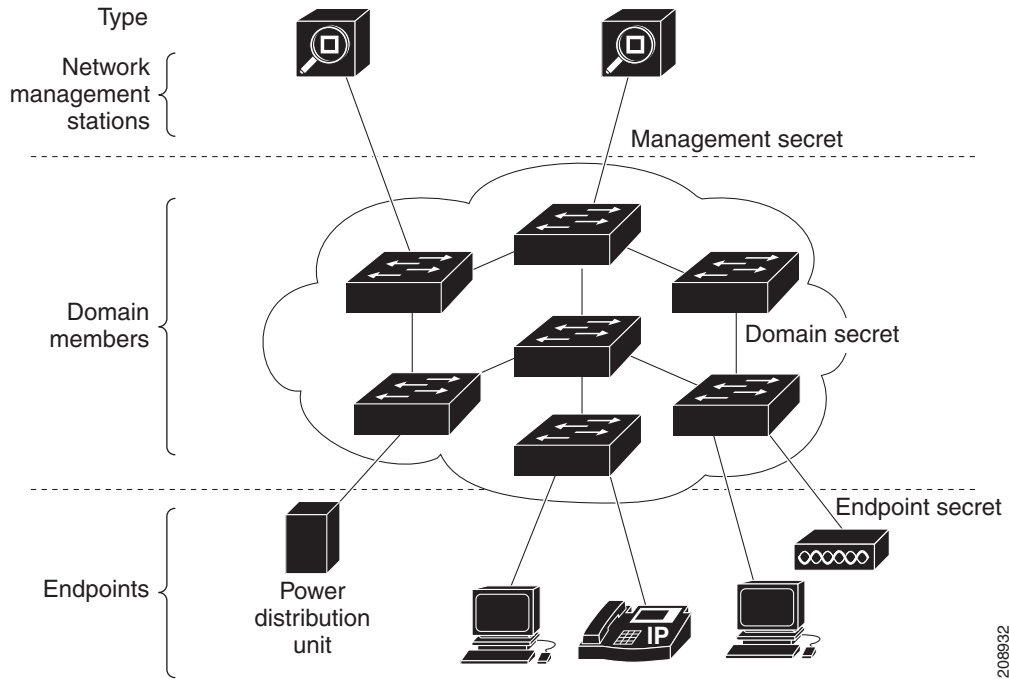
If the domain member fails and then restarts, it uses the power level in the saved startup configuration.

Security

An EnergyWise network has three levels of security to prevent unauthorized communication. It enforces security with *shared secrets*, also referred to as *passwords*.

- The management secret authenticates communication between the domain members and the management station.
- The domain secret authenticates communication between domain members.
- The endpoint secret authenticates communication between domain members and endpoints.

Figure 1-1 EnergyWise Security Levels



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MIBs

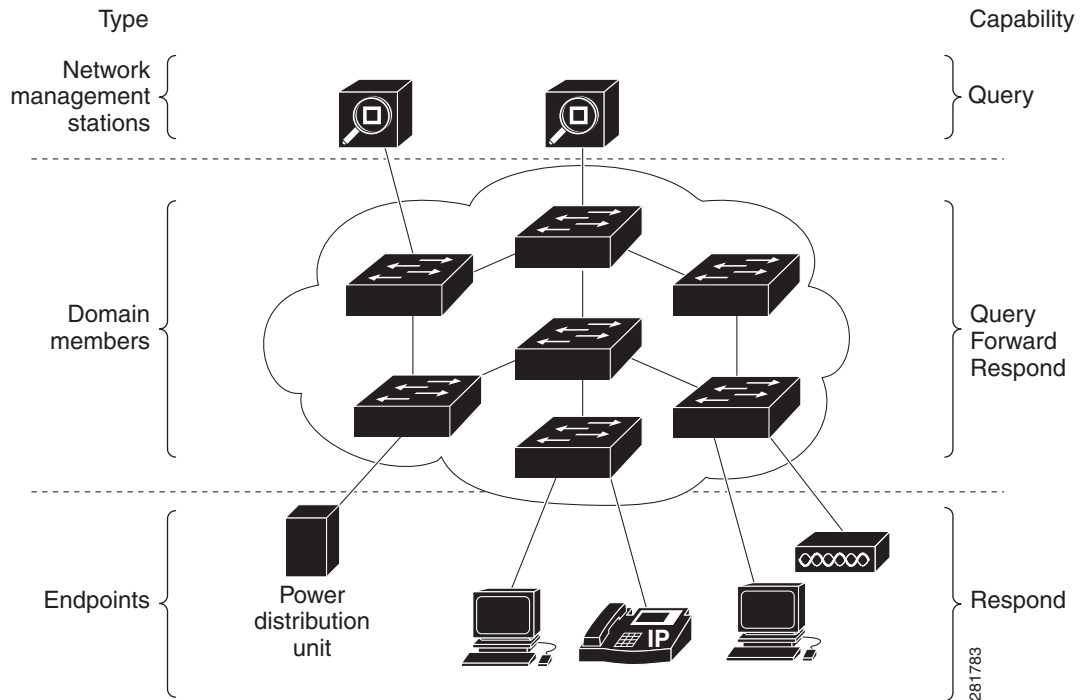
EnergyWise domain members support the CISCO-ENERGYWISE-MIB.

To locate and download MIBs for a specific Cisco product and release, use the Cisco MIB Locator: <http://cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml>.

Overview

In a network, Cisco EnergyWise monitors and manages the power usage of network devices and devices connected to the network.

Figure 1-2 EnergyWise Network



- Management stations—Control applications and devices that use EnergyWise to monitor and manage the power usage of domain members and endpoints. Management stations also send queries to domain members.
- Domain members—Include Cisco switches, routers, and network devices. They forward messages across an EnergyWise *domain* to endpoints. They also forward and reply to queries from the management station and other domain members and aggregate power-usage information from the endpoints.
- Endpoints—Devices that are connected to a domain member and that use power. They respond to queries but do not send or forward them. You can install the software development kit (SDK) library on IP endpoints.

Domain members and endpoints receive power from an AC or DC power source or a power supply.

PoE domain members and endpoints also receive power from PoE switches or Cisco EtherSwitch service modules. For example, IP phones and access points connected to a PoE switch receive power from the switch.